APPENDIX 1.1:

APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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URBAN CROSSROADS

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August 5, 2016

Ms. Karen Campbell
Public Works Department
City of Chino
13220 Central Avenue
Chino, CA 91708

SUBJECT: SCOPING ASSUMPTIONS FOR THE KIMBALL BUSINESS CENTER TRAFFIC IMPACT ANALYSIS

Dear Ms. Karen Campbell:

The firm of Urban Crossroads, Inc. is pleased to submit this letter documenting the recommended scoping assumptions for the proposed Kimball Business Center ("Project"), which is located between Kimball Avenue and Bickmore Avenue on either side of the future Mayhew Avenue in the City of Chino. Urban Crossroads, Inc. has calculated trip generation, evaluated trip distribution patterns, and the recommended analysis locations. It is our understanding that the Project is to consist of up to 1,313,000 square feet (sf) of business center use, with 715,000 sf of warehouse, 255,000 sf of general light industrial use, 233,000 sf of business park use, and a 110,000 sf self-storage facility, and is anticipated to be developed in 3 phases with a projected Project Buildout of 2019.

PROJECT DESCRIPTION

Exhibit 1 illustrates the preliminary Project site plan. As indicated on Exhibit 1, the total development is proposed to consist of up to 1,313,000 sf of business center use, specifically with the following uses:

- 715,000 sf of warehousing use within 4 buildings (Buildings 5, 6, 7, and 8). Warehouse use has been utilized for a portion of the buildings that are proposed to include dock doors.
- 255,000 sf of general light industrial use within 3 buildings (Buildings 1, 3, and 4). General Light Industrial use has been utilized for remaining buildings that are proposed to include dock doors.
- 233,000 sf of business park use within 14 buildings (Buildings 9A, 9B, 10, 11, and A through J). The business park land use has been utilized for all the remaining smaller buildings without dock doors.
- 110,000 sf of self-storage within 1 building (Building 2).

The Project is planned to be completed in 3 phases, as illustrated in Exhibit 1:

- Phase 1 (2017): Buildings 6, 7, and 8 – 515,000 sf Warehouse

- Phase 2 (2018): Buildings 3, 4, and 5 – 180,000 sf of General Light Industrial use and 200,000 sf Warehouse
- Phase 3 (2019): Buildings 1, 2, 9A, 9B, 10, 11, and A through J – 75,000 sf General Light Industrial use, 233,000 sf Business Park, and 110,000 sf Self-Storage

Exhibit 2 illustrates the proposed study area and study area intersections. As indicated on Exhibit 2, the proposed development is located between Kimball Avenue and Bickmore Avenue on either side of the future Mayhew Avenue in the City of Chino.

The Project is approximately 2.50 miles northeast from the Euclid Avenue and State Route 71 (SR-71) Interchange and approximately 4.65 miles south of the State Route 60 (SR-60) Freeway. Vehicular and truck traffic access will be provided via the following driveways (see Exhibit 1):

- Driveway 1 / Bickmore Avenue – Full access driveway providing access to passenger cars only for Buildings 9A/9B
- Driveway 2 / Bickmore Avenue – Right-in/right-out driveway providing access to both passenger cars and trucks for Buildings 9A/9B and 10/11
- Mayhew Avenue / Driveway 3 – Right-in/right-out driveway providing access to passenger cars only for Building 6
- Mayhew Avenue / Driveway 4 – Full access driveway providing access to both passenger cars and trucks for Buildings A, B, and 1
- Mayhew Avenue / Driveway 5 – Full access driveway providing access to both passenger cars and trucks for Building 5
- Mayhew Avenue / Driveway 6 – Full access driveway providing access to passenger cars only for Building 6
- Mayhew Avenue / Driveway 7 – Full access driveway providing access to passenger cars only for Building 5
- Mayhew Avenue / Driveway 8 – Full access driveway providing access to both passenger cars and trucks for Building 6
- Mayhew Avenue / Driveway 9 – Full access driveway providing access to both passenger cars and trucks for Building 7
- Mayhew Avenue / Driveway 10 – Full access driveway providing access to both passenger cars and trucks for Buildings 7 & 8
- Mayhew Avenue / Driveway 11 – Full access driveway providing access to both passenger cars and trucks for Building 8

- Mayhew Avenue / Driveway 12 – Full access driveway providing access to both passenger cars and trucks for Buildings 10 and 11
- Mayhew Avenue / Driveway 13 – Full access driveway providing access to passenger cars only for Buildings 10 and 11
- Driveway 14 / Kimball Avenue – Right-in/right-out driveway providing access to passenger cars only for Buildings A, B, C, and D
- Street B / Driveway 15 – Full access driveway providing access to both passenger cars and trucks for Buildings C through J
- Street B / Driveway 16 – Full access driveway providing access to passenger cars only for Buildings C and D
- Street B / Driveway 17 – Full access driveway providing access to both passenger cars and trucks for Buildings I and J
- Street B / Driveway 18 - Full access driveway providing access to both passenger cars and trucks for Buildings 2, 3, 4, and 5
- Driveway 19 / Kimball Avenue - Right-in/right-out driveway providing access to passenger cars only for Buildings E through H

OPENING YEAR ANALYSIS

Consistent with other traffic studies performed in the area, an Existing plus Project (E+P) condition analysis will be performed to determine the Project's direct impacts. As the Project is anticipated to be developed in a three phases, the following E+P conditions will be analyzed:

- Existing plus Project (Phase 1) – 2017
- Existing plus Project (Phase 1+2) – 2018
- Existing plus Project (Buildout) – 2019

To assess potential cumulative traffic impacts, Opening Year scenarios (identified below) will be evaluated in the traffic study:

- Opening Year Cumulative (2017) Without Project
- Opening Year Cumulative (2017) With Project – Phase 1
- Opening Year Cumulative (2018) Without Project
- Opening Year Cumulative (2018) With Project – Phase 2
- Opening Year Cumulative (2019) Without Project
- Opening Year Cumulative (2019) With Project - Buildout

Other cumulative development projects will be manually added in conjunction with an ambient (background) growth factor for each of the Opening Year Cumulative analysis scenarios. Where applicable, 100% of the cumulative development projects that are either under construction or would be completed by 2017, 2018, or 2019 would be included as opposed to the proposed absorption percentage. We are proposing the following absorption rates be applied to the remaining cumulative projects for each of the phases: 15% for Phase 1, 25% for Phase 2, and 35% for Phase 3.

HORIZON YEAR (2040) ANALYSIS

The Horizon Year (2040) traffic volume forecasts will be based on data obtained from the Chino Traffic Model using accepted procedures for model forecast refinement and smoothing with the exception of study area intersections located in Riverside County. Horizon Year forecasts for study area intersections located within the County of Riverside will be derived from the Riverside County Transportation Analysis Model (RivTAM).

The Horizon Year (2040) traffic forecasts for the study area will be based on existing peak hour traffic count data and raw model output data. Data will be obtained from the Chino Traffic Model and RivTAM for the Without Project scenario.

The following Horizon Year (2040) scenarios will be evaluated in the traffic study:

- Horizon Year (2040) Without Project
- Horizon Year (2040) With Project

TRIP GENERATION

Trip generation represents the amount of traffic that is attracted and produced by a development, and is based upon the specific land uses planned for a given project. Trip generation rates for the Project are shown in Table 1 for both passenger car equivalent (PCE) and actual vehicles. The trip generation summary illustrating daily and peak hour trip generation estimates for the proposed Project in PCE are shown on Table 2, and Table 3 shows the trip generation summary based on actual vehicles.

The trip generation rates used for this analysis are based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their *Trip Generation* manual, 9th Edition, 2012.

For purposes of this analysis, the following ITE land use codes and vehicle mixes have been utilized:

- ITE land use code 110 (General Light Industrial) has been used to derive site specific trip generation estimates for Buildings 1, 3, and 4. The ITE *Trip Generation* manual includes very limited data regarding the types of vehicles that are generated for general light industrial uses (passenger cars and various sizes of trucks). As such, data regarding the vehicle mix has been

obtained from a separate report; the City of Fontana *Truck Trip Generation Study* (August 2003) for the general light industrial uses proposed as part of the Project. Buildings 1, 3, and 4 have been identified as light industrial. The "Light Industrial" vehicle mix data has been utilized for all 3 buildings.

- ITE land use code 150 (Warehousing) has been used to derive site specific trip generation estimates for Buildings 5, 6, 7, and 8. The ITE *Trip Generation* manual includes very limited data regarding the types of vehicles that are generated for warehousing uses (passenger cars and various sizes of trucks). Data regarding the vehicle mix has therefore been obtained from a separate report; the City of Fontana *Truck Trip Generation Study* (August 2003) for the warehousing use proposed as part of the Project. Buildings 5, 6, 7, and 8 have been identified as heavy warehouses. The "Heavy Warehouse" vehicle mix data has been utilized for all 4 buildings.
- ITE land use code 770 (Business Park) has been used to derive the site specific trip generation estimates for Buildings 9A, 9B, 10, 11, and A through J. Per the ITE *Trip Generation* manual and as shown on the preliminary site plan, the business park uses are not anticipated to generate any heavy truck traffic (i.e., absence of dock doors). As such, no vehicle mix has been applied to the business park uses proposed as part of the Project. Although there are no dock doors proposed, the ITE truck mix (13%) from the Trip Generation manual has been utilized in response to recent comments received on other projects prepared within the City. As such, the trip generation estimates for the business park use is anticipated to overstate as opposed to understate potential traffic impacts.
- ITE land use code 151 (Mini-Warehouse) has been used to derive the site specific trip generation estimates for Building 2 (self-storage facility). Although not typically applied, the ITE truck mix of 15% from the Trip Generation manual has been utilized to reflect potential truck traffic associated with the self-storage use. As such, the trip generation estimates for the self-storage use is anticipated to overstate as opposed to understate potential traffic impacts.

Finally, PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in Appendix "C" of the San Bernardino County Congestion Management Program (CMP), 2005 Update.

As shown on Table 2, the proposed Project (Project Buildout) is anticipated to generate a net total of 9,144 PCE trip-ends per day, 960 PCE AM peak hour trips and 975 PCE PM peak hour trips. In comparison, the proposed Project (Project Buildout) is anticipated to generate a net total of 7,496 actual vehicle trip-ends per day with 791 AM peak hour trips and 798 PM peak hour trips (see Table 3).

TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern of passenger cars is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. The trip distribution pattern for truck traffic is also influenced by the local truck routes approved by the City of Chino, the City of Chino Hills, the City of Ontario, the City of Eastvale, and the California Department of Transportation (Caltrans). Given these differences, separate trip distributions were generated for both passenger cars and truck trips.

Both the near-term and Horizon Year trip distribution patterns are primarily based on the existing roadway system in relation to the Horizon Year trip distribution patterns. The Project trip distribution patterns are also affected by near-term development patterns in the vicinity of the Project site. It is our understanding that the Pine Avenue Extension west of El Prado Road is anticipated to occur after the Project's anticipated Opening Year. As such, the Pine Avenue Extension would only be assumed to be in place for Horizon Year traffic conditions.

Although funding has not been secured, roadway network changes in the vicinity of the Project study area, such as the Limonite Avenue/Kimball Avenue extension between Hellman Avenue and Archibald Avenue, will be evaluated as part of an Alternative Horizon Year condition.

Exhibit 3 illustrates the truck trip distribution patterns for Opening Year Cumulative and Horizon Year (2040) conditions without the Limonite Avenue extension. As shown on Exhibit 3, trucks are anticipated to utilize designated truck routes such as Kimball Avenue, Euclid Avenue (SR-83), and Central Avenue to reach regional freeways such as the SR-71 and SR-60 Freeways. Exhibit 4 illustrates the Alternative Horizon Year truck trip distribution patterns which will allow for Project access to the I-15 freeway via the future proposed intersection of Limonite Avenue/Kimball Avenue between Hellman Avenue and Archibald Avenue.

Exhibits 5 and 6 illustrate the passenger car trip distribution patterns for Opening Year Cumulative and Horizon Year (2040) without the Limonite Avenue extension, respectively. Similar to the truck trip distributions, passenger cars are anticipated to utilize Kimball Avenue and Bickmore Avenue to reach destinations to the west of the Project site for Opening Year Cumulative traffic conditions and the extension of Pine Avenue west of El Prado Road will also be assumed for Horizon Year (2040) traffic conditions. Exhibit 7 illustrates the Alternative passenger car trip distribution patterns, which assumes that the anticipated extension of Limonite Avenue/Kimball Avenue would be in place between Hellman Avenue and Archibald Avenue.

PROJECT ONLY LINK VOLUMES

The purpose of generating Project only link volumes is to determine the appropriate limits of the traffic analysis (study area intersections). The Project only traffic forecasts have been generated by applying the PM peak hour trip generation estimates to the anticipated near-term and Horizon Year trip distribution patterns (previously presented). The PM peak hour trip generation of the Project has been used because the Project is anticipated to generate more vehicle trip-ends in the PM peak hour as compared to the AM peak hour. These link volumes have been used to identify the intersection analysis locations. Exhibit 6 shows the Project only PM PCE link volumes for near-term conditions, Exhibit 7 shows the Project only PM PCE link volumes for long-range traffic conditions.

INTERSECTION ANALYSIS LOCATIONS

Per the City of Chino General Plan 2025 (dated July 2010), the Kimball Business Center traffic study shall implement the San Bernardino Associated Governments (SANBAG) Congestion Management Program (CMP) for traffic impact analysis reports. CMP intersections, where applicable, are illustrated on Exhibit 2. The general preparation of the traffic impact study for this Project will continue to be in conformance with the typical requirements of the San Bernardino County CMP.

Exhibit 2 depicts the recommended intersection analysis locations, based upon the analysis in this scoping letter. The recommended local analysis locations are based on the highest Project traffic contribution presented for the Opening Year Cumulative and Horizon Year (2040) scenarios.

INTERSECTION ANALYSIS METHODOLOGY

For the purposes of this analysis, signalized intersection operations analysis will be based on the methodology described in Chapter 18 and 31 of the *Highway Capacity Manual* (2010). Intersection LOS operations are based on an intersection's average control delay. A maximum cycle length of 120 seconds will be utilized per direction from City of Chino staff. Unsignalized intersections will be evaluated using the methodology described in Chapter 19, Chapter 20, and Chapter 32 of the HCM 2010. At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

Consistent with Appendix C, Page C-13 of the San Bernardino County CMP, the following saturation flow rates, in vehicles per hour green per lane (vphgpl), will be utilized in the traffic analysis for signalized intersections:

Existing and Opening Year Cumulative Traffic Conditions:

- Exclusive through: 1800 vphgph
- Exclusive left: 1700 vphgph
- Exclusive right: 1800 vphgph
- Exclusive dual left: 1600 vphgph
- Exclusive triple left: 1500 vphgph

Horizon Year (2040) Traffic Conditions:

- Exclusive through: 1900 vphgph
- Exclusive left: 1800 vphgph
- Exclusive dual left: 1700 vphgph
- Exclusive right: 1900 vphgph
- Exclusive dual right: 1800 vphgph
- Exclusive triple left: 1600 vphgph or less

TRAFFIC COUNTS

New traffic counts will be conducted before local schools are released for the summer. Our understanding is schools within the Chino Valley Unified School District are released for summer break the week of June 6, 2016. Traffic counts were conducted prior to summer break for local schools back in May of 2016.

LEVEL OF SERVICE (LOS) CRITERIA

The definitions of an operational deficiency for each of the applicable jurisdictions are as follows:

CITY OF CHINO

According to the City of Chino, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours. Therefore, any intersection operating at LOS E or F is considered deficient. LOS will also be reported by movement for the City's review.

CITY OF CHINO HILLS

Similar to the City of Chino, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours in the City of Chino Hills. Therefore, any intersection operating at LOS E or F is considered deficient/unsatisfactory.

CITY OF ONTARIO

The City of Ontario utilizes a minimum acceptable LOS of LOS E.

CITY OF EASTVALE

The City of Eastvale General Plan Policy C-10 sets a standard of LOS C with LOS D as acceptable in commercial and employment areas and at intersections of any combination of major highways, urban arterials, secondary highways, or freeway ramps. Based on this criteria, LOS D is the minimum acceptable LOS at all study intersections in the City of Eastvale.

CMP

The CMP definition of deficiency is based on maintaining a level of service standard of LOS E or better, except where an existing LOS F condition is identified in the CMP document.

CALTRANS

For the study intersections at Caltrans freeway-to-arterial ramps, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours.

SPECIAL ISSUES

The following special issues will be addressed in the traffic study:

- Truck turning templates will be used to address how Project truck traffic (e.g., large trucks such as a WB-67) would enter and exit the Project site to determine radii at curb returns, radii of streets per Highway Design Manual, and widths/radii required for on-site maneuvering for two-way truck traffic.
- Ultimate lane geometrics (including turn pocket lengths) will be determined for the following intersections:
    - Mayhew Avenue at Kimball Avenue
    - Mayhew Avenue at Bickmore Avenue
    - Driveway 16 at Kimball Avenue
- Provide a queuing analysis for the Project driveways and site adjacent signalized intersections for Horizon Year (2040) traffic conditions to determine necessary storage lengths. Site plan and proposed driveway placement/median openings will need to be reviewed for locations and queuing of trucks/cars based on proximity to the intersection of Mayhew Avenue/Kimball Avenue, Mayhew Avenue/Bickmore Avenue, and distances to other driveways. This review shall occur prior to finalizing site plan.
- "Fair-share" contributions for improvements within the City's two DIF programs and within in other jurisdictions will be included in the TIA.

- Horizontal sight distance will be evaluated at all driveways and site adjacent intersections.

CUMULATIVE DEVELOPMENT PROJECTS

Exhibit 11 illustrates a cumulative development location map. A summary of the cumulative development projects is shown on Table 4. Please review to let us know if there are any projects that should be removed or provide information on new cumulative projects that should be added. We will also reach out to the adjacent City of Chino Hills, City of Ontario, City of Eastvale, City of Corona, and City of Norco to obtain updated cumulative projects within their respective jurisdictions.

Cumulative development projects will be utilized for evaluating Opening Year Cumulative traffic conditions, in conjunction with the addition of background growth (i.e., compounded growth of 2 percent per year over 2 years).

FEE PROGRAM

It is requested that the City provide a list of facilities that are included in the City's fee program.

SIGNAL TIMING

It is requested that the City of Chino provide existing signal timing for intersections within their jurisdiction. Caltrans and the adjacent City of Chino Hills, City of Ontario, City of Eastvale, City of Corona, and City of Norco will also be contacted to obtain existing signal timing for facilities located within their jurisdiction. If existing signal timing is not available, default values consistent with the most current CA MUTCD guidelines will be utilized.

CONCLUSION

Urban Crossroads, Inc. is pleased to submit this letter documenting the Project trip generation, trip distribution, and the recommended intersection analysis locations for the Kimball Business Center Traffic Impact Analysis. We will continue to move forward towards completing the traffic study after receiving jurisdiction approval or comments finalizing the study area.

If you have any questions, please contact me directly at (949) 336-5978.

Respectfully submitted,

URBAN CROSSROADS, INC.

Aric Evatt, PTP
Principal

Charlene So, PE
Senior Transportation Engineer

Attachments

EXHIBIT 1: SITE PLAN

LEGEND:

RIRO	= RIGHT-IN/RIGHT-OUT ONLY ACCESS
P	= PASSENGER CARS ONLY
T	= TRUCKS ONLY
PT	= PASSENGER CARS AND TRUCKS

NOTE: UNLESS NOTED, ALL DRIVEWAYS ARE ASSUMED TO BE FULL ACCESS.

N

EXHIBIT 2: LOCATION MAP

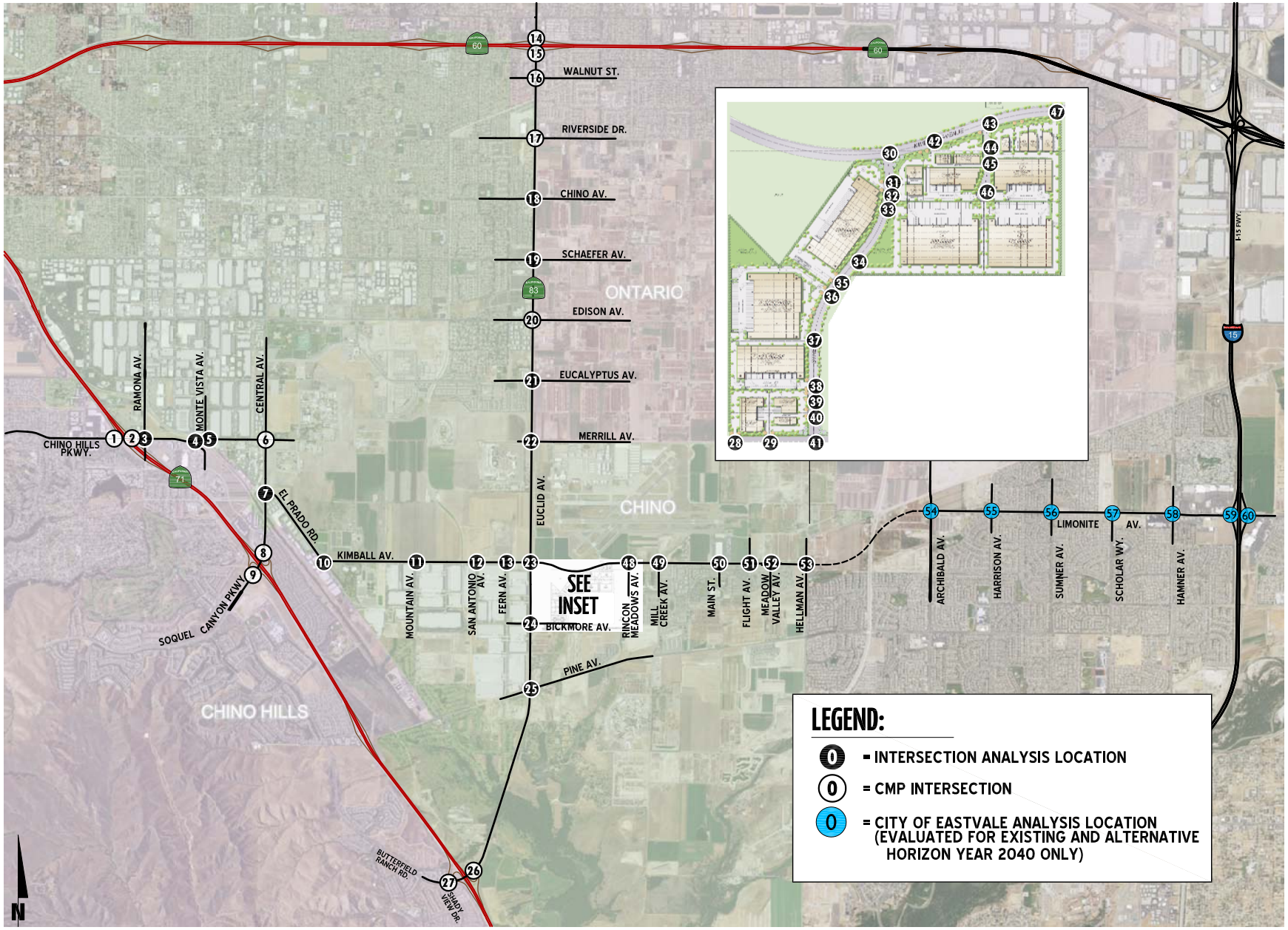

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EXHIBIT 3 (1 OF 2): PROJECT TRUCK TRIP DISTRIBUTION (INTERIM YEAR AND HORIZON YEAR WITHOUT LIMONITE EXTENSION)

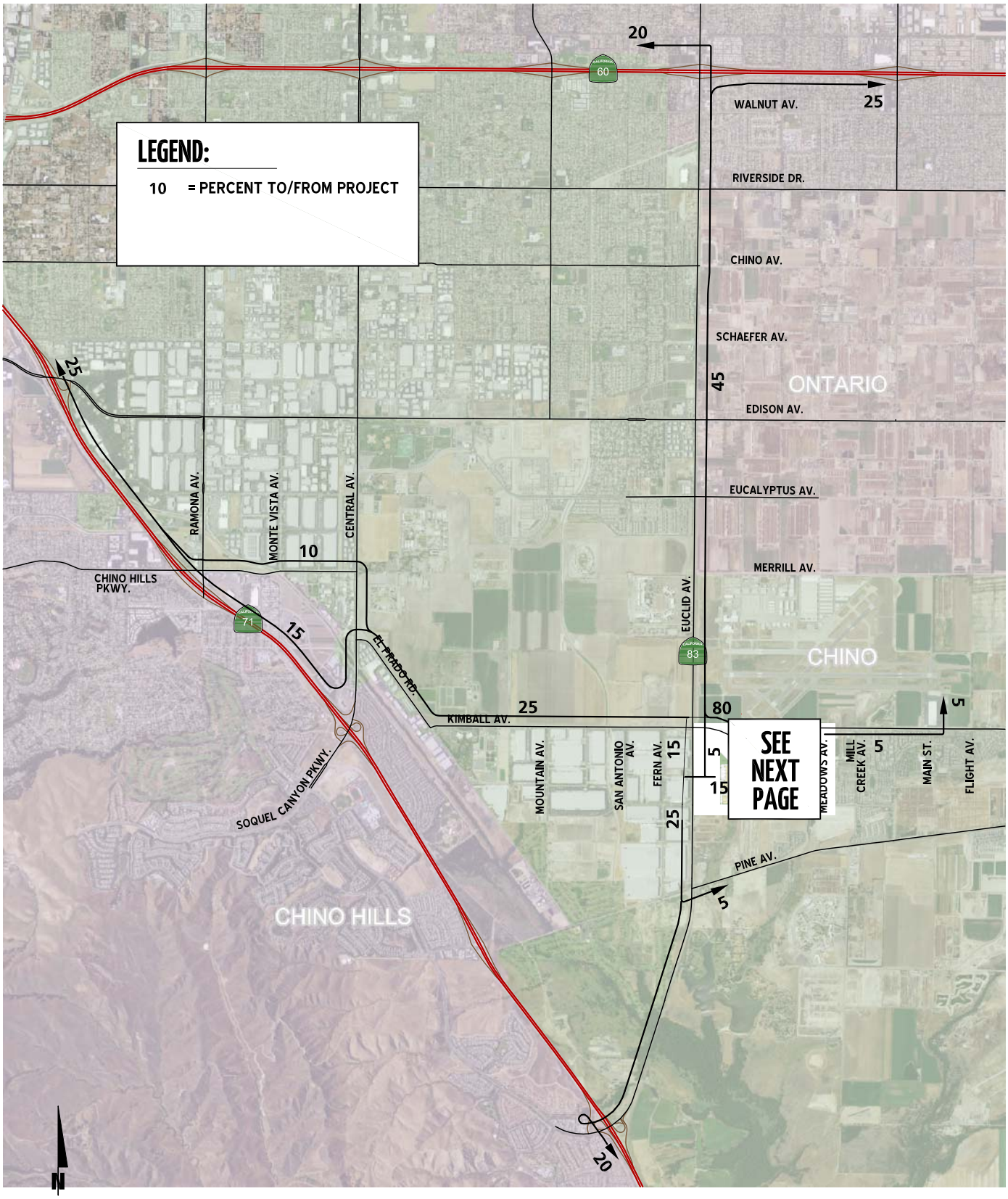

EXHIBIT 3 (2 OF 2): PROJECT TRUCK TRIP DISTRIBUTION (INTERIM YEAR AND HORIZON YEAR WITHOUT LIMONITE EXTENSION)

LEGEND:

10 = PERCENT TO/FROM PROJECT

← = OUTBOUND

= INBOUND

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EXHIBIT 4 (1 OF 2): PROJECT TRUCK TRIP DISTRIBUTION (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION)

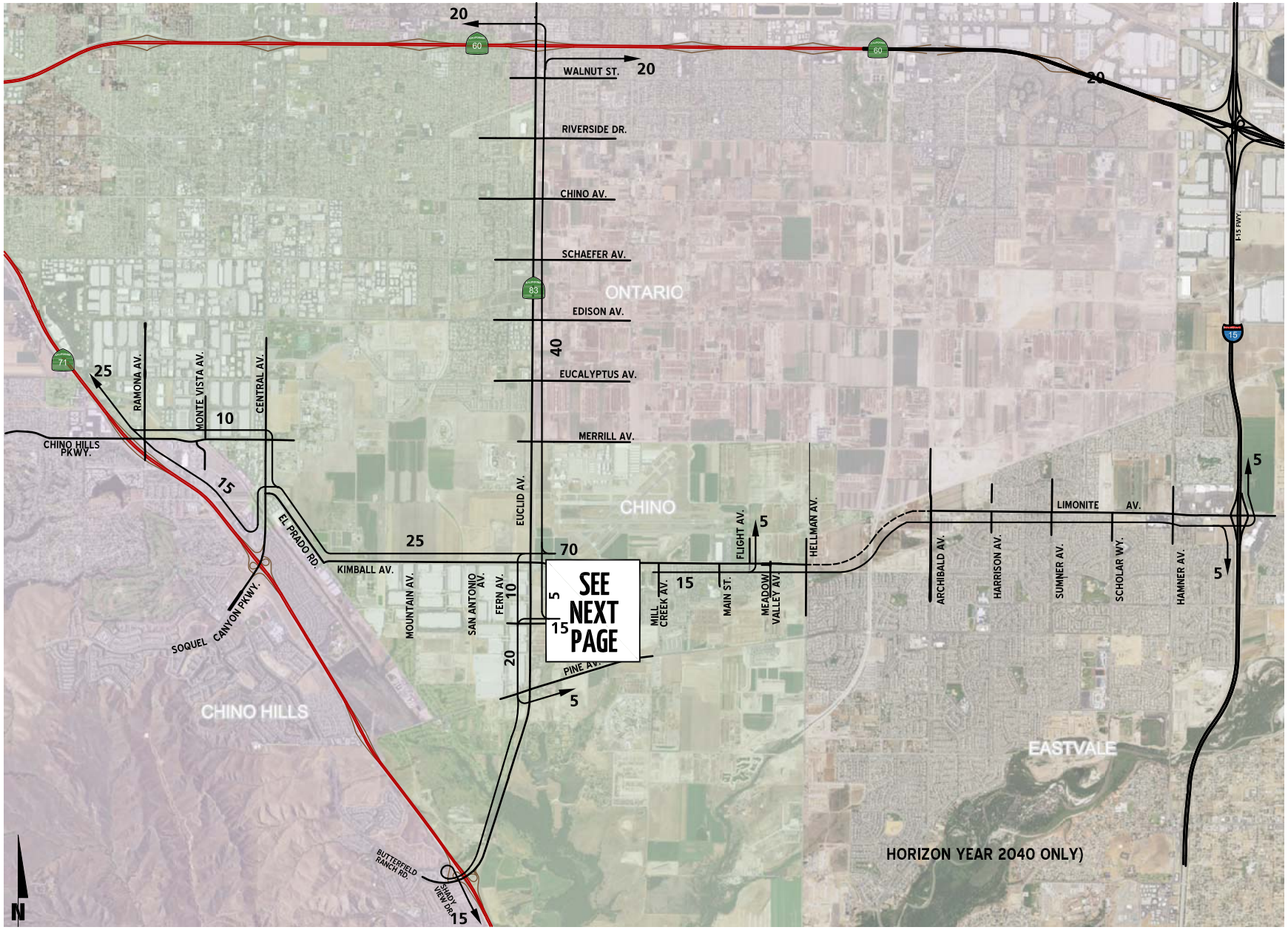

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EXHIBIT 4 (2 OF 2): PROJECT TRUCK TRIP DISTRIBUTION (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION)

LEGEND:

10 = PERCENT TO/FROM PROJECT

← = OUTBOUND

= INBOUND

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EXHIBIT 5 (1 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (INTERIM YEAR)

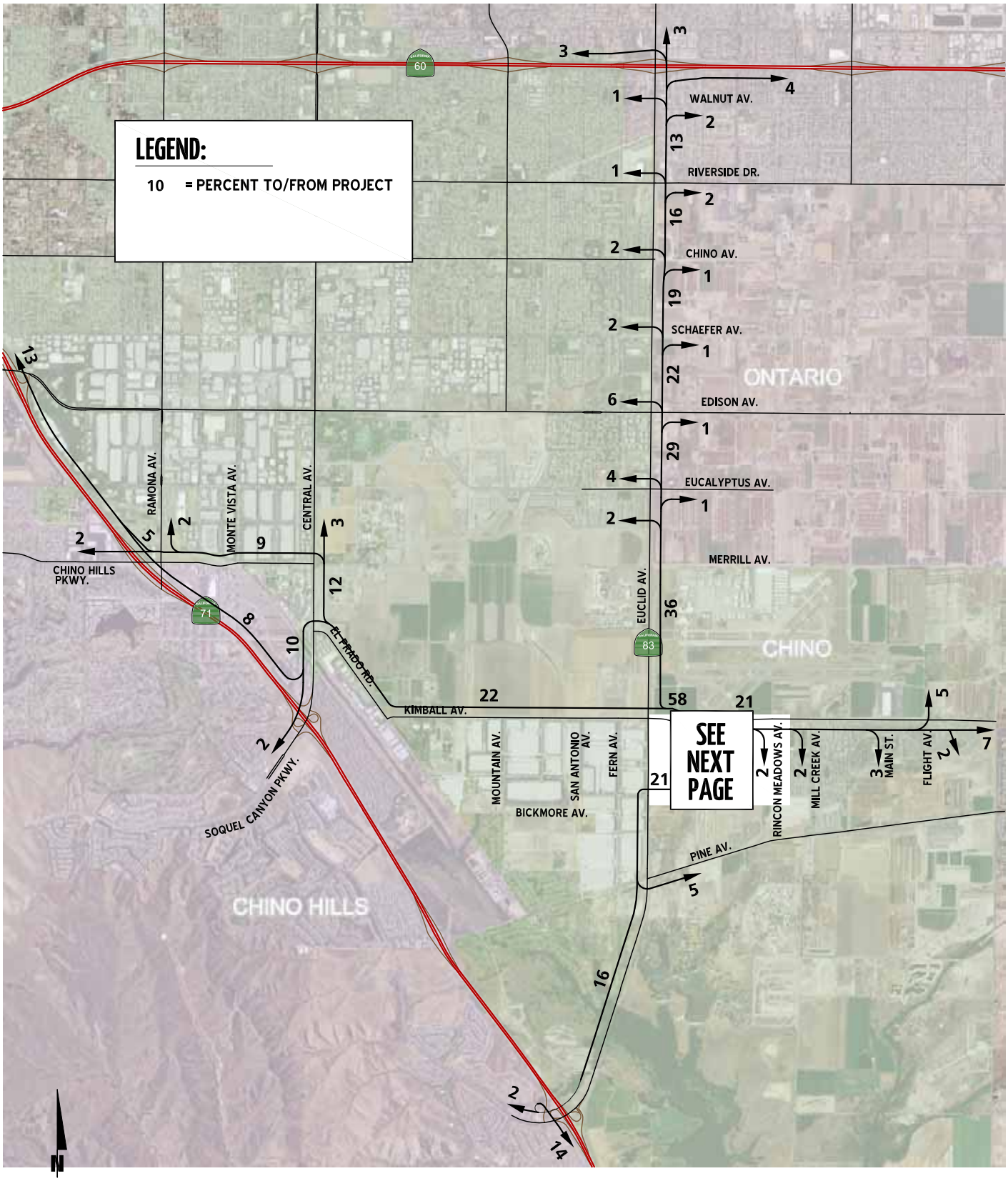

EXHIBIT 5 (2 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (INTERIM YEAR)

LEGEND:

10 = PERCENT TO/FROM PROJECT

← = OUTBOUND

← = INBOUND

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EXHIBIT 6 (1 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION)

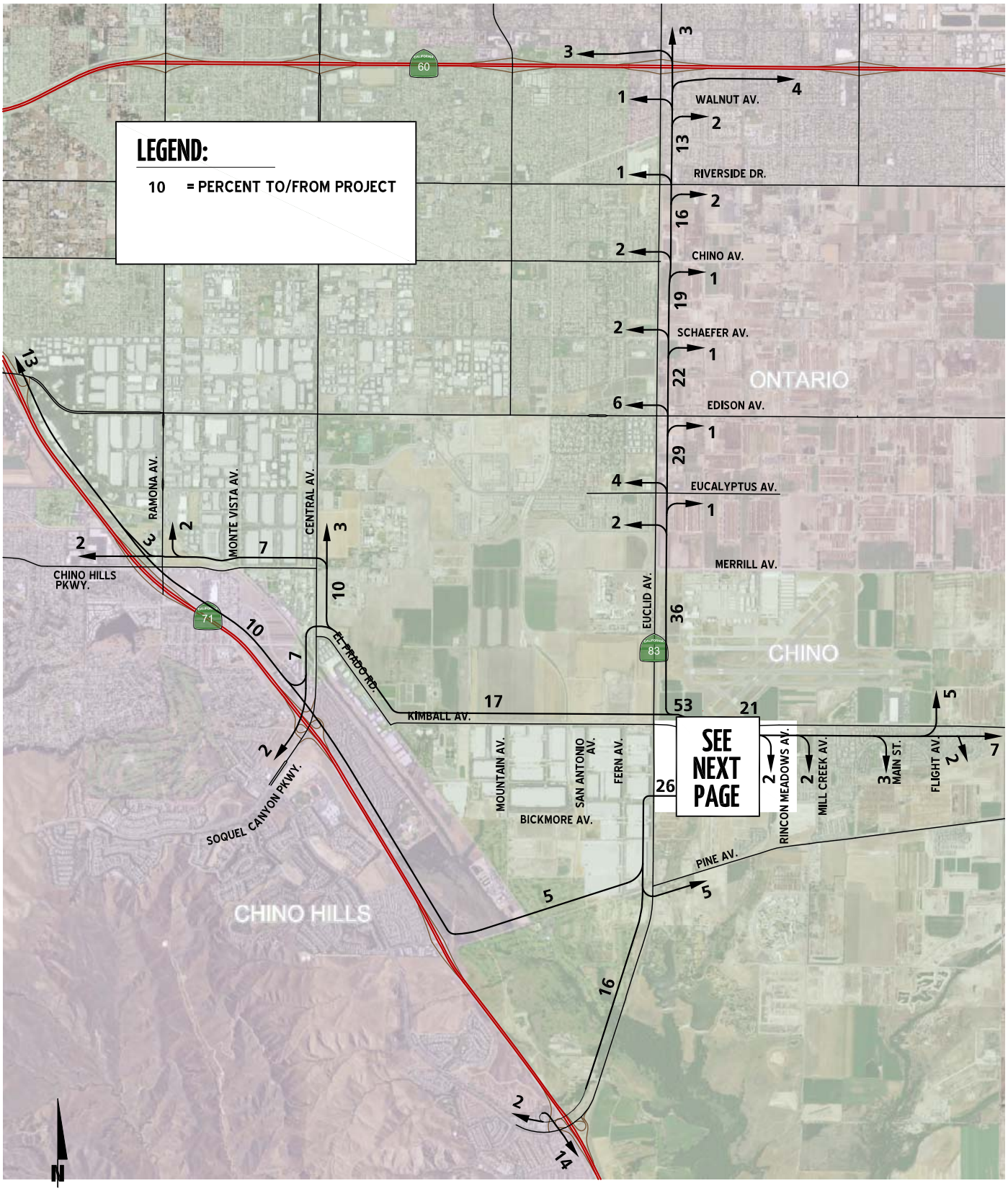

EXHIBIT 6 (2 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION)

LEGEND:

10 = PERCENT TO/FROM PROJECT

= OUTBOUND

= INBOUND

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EXHIBIT 7 (1 OF 2): PROJECT PASSENGER CAR DISTRIBUTION (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION)

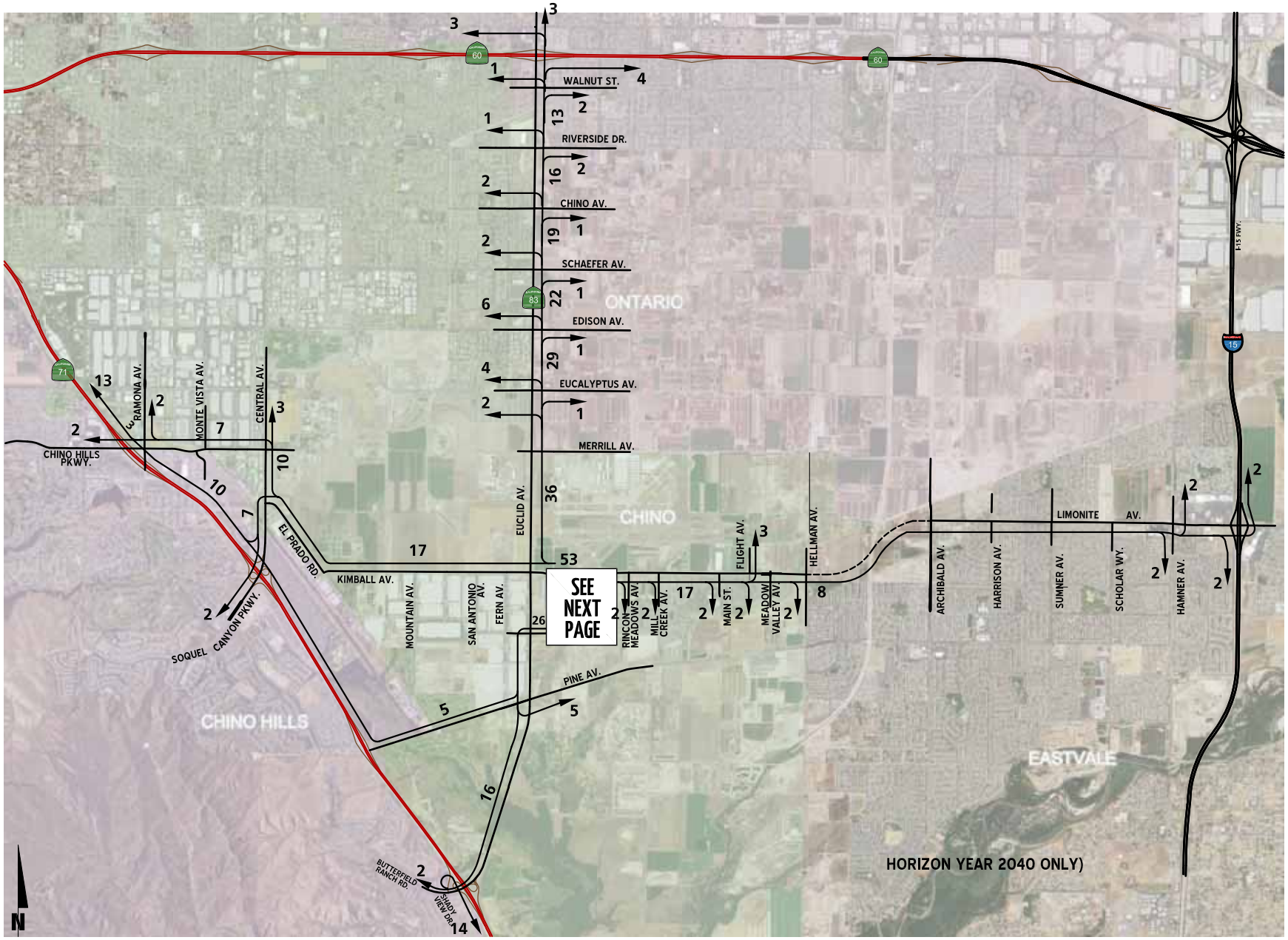

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EXHIBIT 7 (2 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION)

LEGEND:

10 = PERCENT TO/FROM PROJECT

← = OUTBOUND

← = INBOUND

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EXHIBIT 8: PROJECT ONLY (INTERIM YEAR) PM PCE LINK VOLUMES

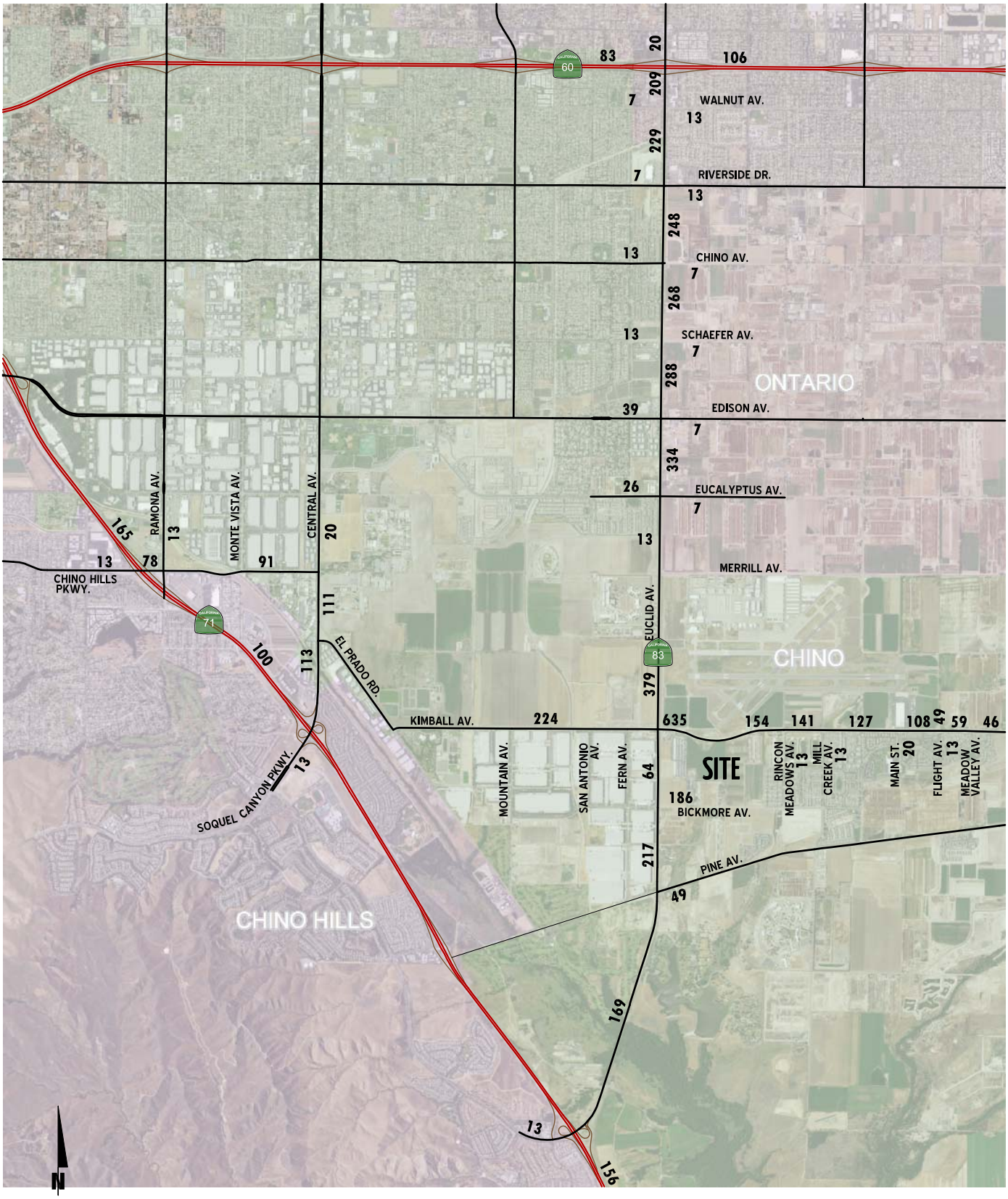

EXHIBIT 9: PROJECT ONLY (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION)
PM PCE LINK VOLUMES

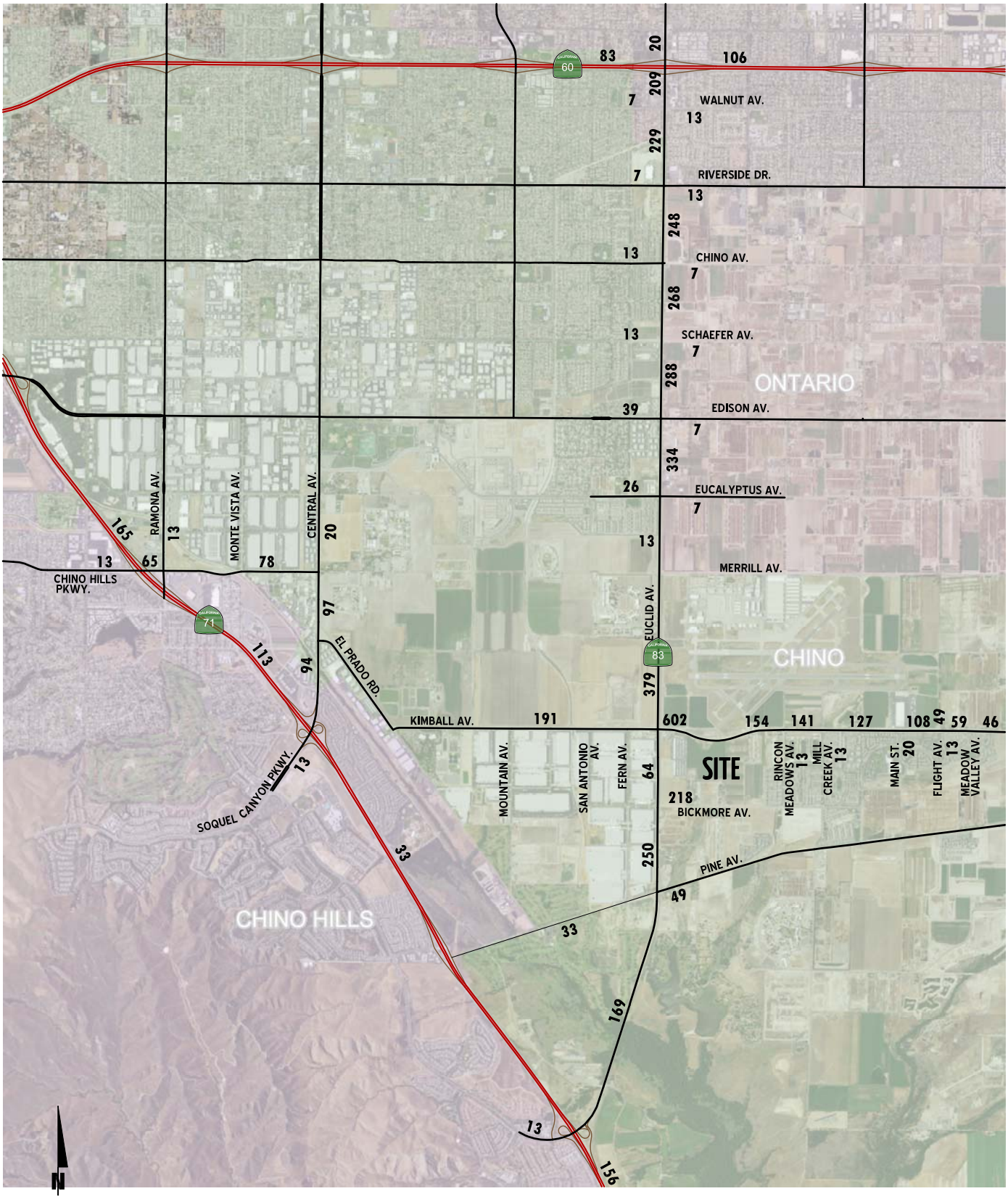

EXHIBIT 10: PROJECT ONLY (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION) PM PCE LINK VOLUMES

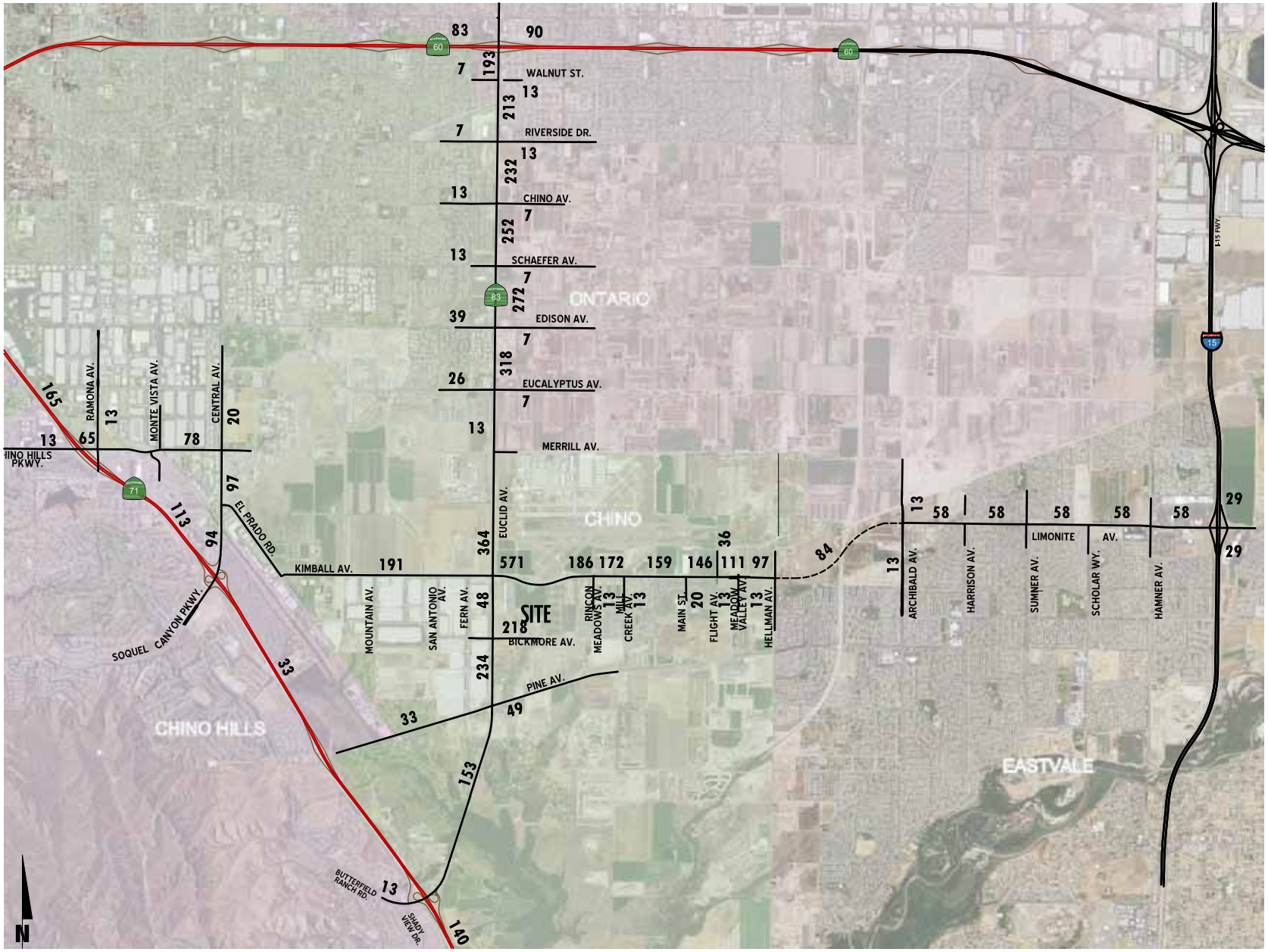

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EXHIBIT 11: CUMULATIVE DEVELOPMENT LOCATION MAP

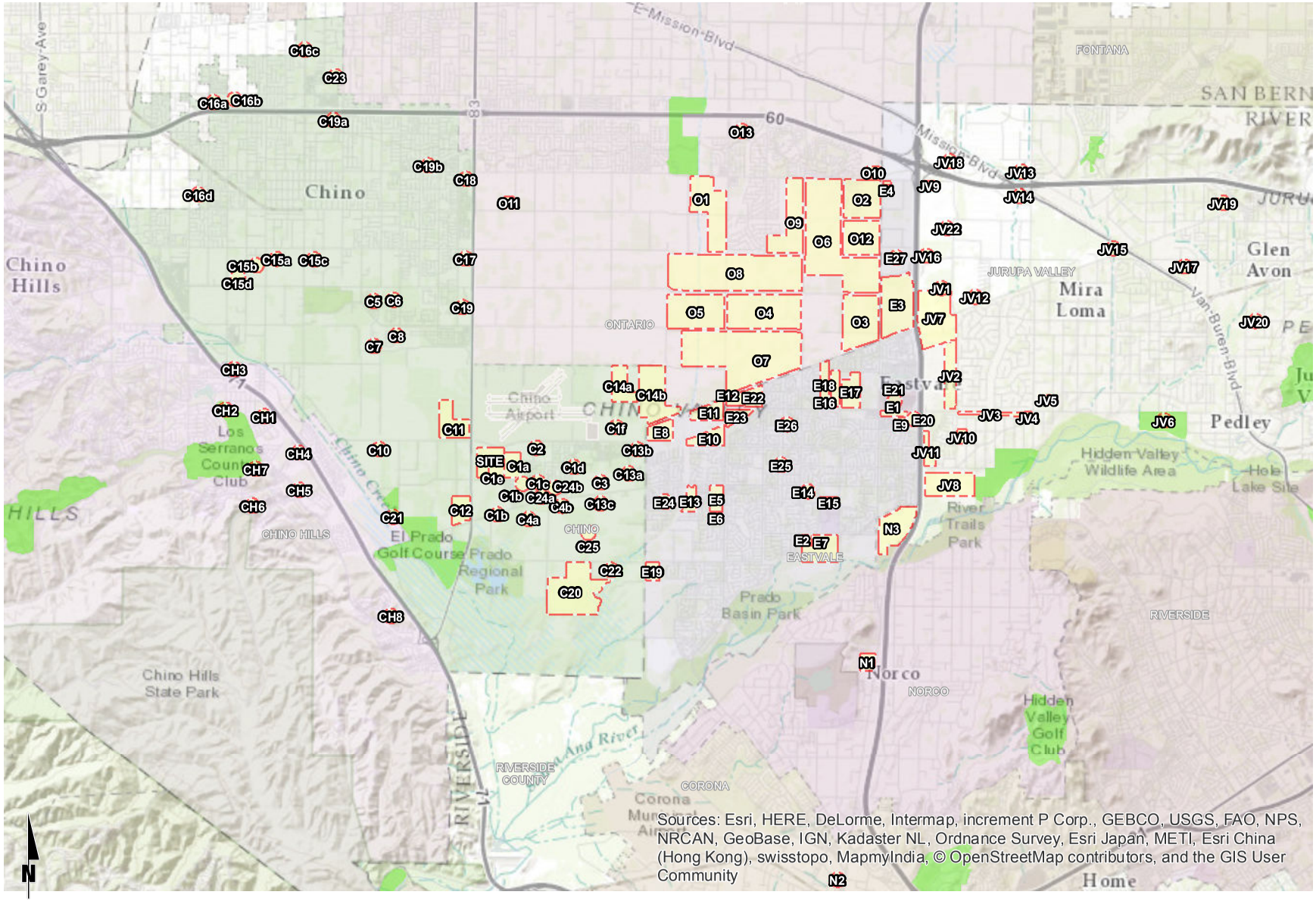

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Table 1

Project Trip Generation Rates

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Rates (PCE)									
General Light Industrial[3]	TSF	110	0.810	0.110	0.920	0.120	0.850	0.970	6.970
Passenger Cars			0.637	0.086	0.723	0.094	0.668	0.762	5.478
2-Axle Trucks (PCE = 1.5)			0.097	0.013	0.110	0.014	0.102	0.116	0.836
3-Axle Trucks (PCE = 2.0)			0.063	0.009	0.072	0.009	0.066	0.076	0.544
4-Axle+ Trucks (PCE = 3.0)			0.231	0.031	0.262	0.034	0.242	0.276	1.986
Warehouse[4]	TSF	150	0.240	0.060	0.300	0.080	0.240	0.320	3.560
Passenger Cars			0.191	0.048	0.239	0.064	0.191	0.255	2.833
2-Axle Trucks (PCE = 1.5)			0.012	0.003	0.016	0.004	0.012	0.017	0.185
3-Axle Trucks (PCE = 2.0)			0.022	0.006	0.028	0.007	0.022	0.030	0.330
4-Axle+ Trucks (PCE = 3.0)			0.089	0.022	0.111	0.030	0.089	0.118	1.317
Mini-Warehouse[5]	TSF	151	0.080	0.060	0.140	0.130	0.130	0.260	2.500
Passenger Cars			0.068	0.051	0.119	0.111	0.111	0.221	2.125
2-Axle Trucks (PCE = 1.5)			0.004	0.003	0.008	0.007	0.007	0.014	0.139
3-Axle Trucks (PCE = 2.0)			0.005	0.004	0.009	0.008	0.008	0.016	0.155
4-Axle+ Trucks (PCE = 3.0)			0.020	0.015	0.034	0.032	0.032	0.064	0.614
Business Park[6]	TSF	770	1.190	0.210	1.400	0.330	0.930	1.260	12.440
Passenger Cars			1.035	0.183	1.218	0.287	0.809	1.096	10.823
2-Axle Trucks (PCE = 1.5)			0.057	0.010	0.067	0.016	0.045	0.061	0.599
3-Axle Trucks (PCE = 2.0)			0.064	0.011	0.075	0.018	0.050	0.067	0.666
4-Axle+ Trucks (PCE = 3.0)			0.253	0.045	0.298	0.070	0.198	0.268	2.649

Table 1

Project Trip Generation Rates

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Rates (Actual Vehicles)									
General Light Industrial[3]	TSF	110	0.810	0.110	0.920	0.120	0.850	0.970	6.970
Passenger Cars			0.637	0.086	0.723	0.094	0.668	0.762	5.478
2-Axle Trucks (PCE = 1.5)			0.065	0.009	0.074	0.010	0.068	0.078	0.558
3-Axle Trucks (PCE = 2.0)			0.032	0.004	0.036	0.005	0.033	0.038	0.272
4-Axle+ Trucks (PCE = 3.0)			0.077	0.010	0.087	0.011	0.081	0.092	0.662
Warehouse[4]	TSF	150	0.240	0.060	0.300	0.080	0.240	0.320	3.560
Passenger Cars			0.191	0.048	0.239	0.064	0.191	0.255	2.833
2-Axle Trucks			0.008	0.002	0.010	0.003	0.008	0.011	0.123
3-Axle Trucks			0.011	0.003	0.014	0.004	0.011	0.015	0.165
4-Axle+ Trucks			0.030	0.007	0.037	0.010	0.030	0.039	0.439
Mini-Warehouse[5]	TSF	151	0.080	0.060	0.140	0.130	0.130	0.260	2.500
Passenger Cars			0.068	0.051	0.119	0.111	0.111	0.221	2.125
2-Axle Trucks			0.003	0.002	0.005	0.005	0.005	0.010	0.093
3-Axle Trucks			0.002	0.002	0.004	0.004	0.004	0.008	0.077
4-Axle+ Trucks			0.007	0.005	0.011	0.011	0.011	0.021	0.205
Business Park[6]	TSF	770	1.190	0.210	1.400	0.330	0.930	1.260	12.440
Passenger Cars			1.035	0.183	1.218	0.287	0.809	1.096	10.823
2-Axle Trucks			0.038	0.007	0.045	0.011	0.030	0.040	0.399
3-Axle Trucks			0.032	0.006	0.037	0.009	0.025	0.034	0.333
4-Axle+ Trucks			0.084	0.015	0.099	0.023	0.066	0.089	0.883

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Ninth Edition (2012).

[2] TSF = thousand square feet

[3] General Light Industrial Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 110, August 2003. PCE rates are per SANBAG.

[4] Warehouse Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 150, August 2003. PCE rates are per SANBAG.

[5] 15% trucks per ITE Trip Generation manua; Truck mix per City of Fontana Truck Trip Generation Study for LU 150, August 2003. PCE rates are per SANBAG.

[6] 13% trucks per ITE Trip Generation manua; Truck mix per City of Fontana Truck Trip Generation Study for LU 150, August 2003. PCE rates are per SANBAG.

Project Trip Generation Summary (PCE)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 1									
Building 6 (Warehouse)	185.000	TSF							
Passenger Cars:			35	9	44	12	35	47	524
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*34*
3-axle:			*4*	*1*	*5*	*1*	*4*	*5*	*61*
4+-axle:			*16*	*4*	*21*	*5*	*16*	*22*	*244*
- Net Truck Trips (PCE)[2]			*23*	*6*	*29*	*8*	*23*	*30*	*339*
BUILDING 6 TOTAL NET TRIPS (PCE)[3]			***58***	***15***	***73***	***19***	***58***	***78***	***863***
Building 7 (Warehouse)	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	567
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*37*
3-axle:			*4*	*1*	*6*	*1*	*4*	*6*	*66*
4+-axle:			*18*	*4*	*22*	*6*	*18*	*24*	*263*
- Net Truck Trips (PCE)[2]			*25*	*6*	*31*	*8*	*25*	*33*	*366*
BUILDING 7 TOTAL NET TRIPS (PCE)[3]			***63***	***16***	***79***	***21***	***63***	***84***	***933***
Building 8 (Warehouse)	130.000	TSF							
Passenger Cars:			25	6	31	8	25	33	368
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*24*
3-axle:			*3*	*1*	*4*	*1*	*3*	*4*	*43*
4+-axle:			*12*	*3*	*14*	*4*	*12*	*15*	*171*
- Net Truck Trips (PCE)[2]			*16*	*4*	*20*	*5*	*16*	*21*	*238*
BUILDING 8 TOTAL NET TRIPS (PCE)[3]			***41***	***10***	***51***	***14***	***41***	***55***	***606***
Total (Phase 1)			***162***	***40***	***202***	***54***	***162***	***216***	***2,402***
Phase 2									
Building 3 (General Light Industrial)	80.000	TSF							
Passenger Cars:			51	7	58	8	53	61	438
Truck Trips:									
2-axle:			*8*	*1*	*9*	*1*	*8*	*9*	*67*
3-axle:			*5*	*1*	*6*	*1*	*5*	*6*	*43*
4+-axle:			*18*	*3*	*21*	*3*	*19*	*22*	*159*
- Net Truck Trips (PCE)[2]			*31*	*4*	*36*	*5*	*33*	*37*	*269*
BUILDING 3 TOTAL NET TRIPS (PCE)[3]			***82***	***11***	***93***	***12***	***86***	***98***	***708***
Building 4 (General Light Industrial)	100.000	TSF							
Passenger Cars:			64	9	72	9	67	76	548
Truck Trips:									
2-axle:			*10*	*1*	*11*	*1*	*10*	*12*	*84*
3-axle:			*6*	*1*	*7*	*1*	*7*	*8*	*54*
4+-axle:			*23*	*3*	*26*	*3*	*24*	*28*	*199*
- Net Truck Trips (PCE)[2]			*39*	*5*	*44*	*6*	*41*	*47*	*337*
BUILDING 4 TOTAL NET TRIPS (PCE)[3]			***103***	***14***	***117***	***15***	***108***	***123***	***884***
Building 5 (Warehouse)	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	567
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*37*
3-axle:			*4*	*1*	*6*	*1*	*4*	*6*	*66*
4+-axle:			*18*	*4*	*22*	*6*	*18*	*24*	*263*
- Net Truck Trips (PCE)[2]			*25*	*6*	*31*	*8*	*25*	*33*	*366*
BUILDING 5 TOTAL NET TRIPS (PCE)[3]			***63***	***16***	***79***	***21***	***63***	***84***	***933***
Total (Phase 2)			***248***	***41***	***289***	***48***	***257***	***305***	***2,525***
Total (Phase 1+2)			***410***	***81***	***491***	***102***	***419***	***521***	***4,927***

Project Trip Generation Summary (PCE)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 3 (Buildout)									
Building 1 (General Light Industrial)	75.000	TSF							
Passenger Cars:			48	6	54	7	50	57	411
Truck Trips:									
2-axle:			*7*	*1*	*8*	*1*	*8*	*9*	*63*
3-axle:			*5*	*1*	*5*	*1*	*5*	*6*	*41*
4+-axle:			*17*	*2*	*20*	*3*	*18*	*21*	*149*
- Net Truck Trips (PCE)[2]			*29*	*4*	*33*	*4*	*31*	*35*	*252*
BUILDING 1 TOTAL NET TRIPS (PCE)[3]			***77***	***10***	***88***	***11***	***81***	***92***	***663***
Building 2 (Self Storage)	110.000	TSF							
Passenger Cars:			7	6	13	12	12	24	234
Truck Trips:									
2-axle:			*0*	*0*	*1*	*1*	*1*	*2*	*15*
3-axle:			*1*	*0*	*1*	*1*	*1*	*2*	*17*
4+-axle:			*2*	*2*	*4*	*4*	*4*	*7*	*68*
- Net Truck Trips[2]			*3*	*2*	*6*	*5*	*5*	*10*	*100*
BUILDING 2 TOTAL NET TRIPS (PCE)[3]			***11***	***8***	***19***	***17***	***17***	***35***	***334***
Buildings 9A+ 9B+10+11 (Business Park)	93.000	TSF							
Passenger Cars:			96	17	113	27	75	102	1,007
Truck Trips:									
2-axle:			*4*	*1*	*4*	*1*	*3*	*4*	*37*
3-axle:			*3*	*1*	*3*	*1*	*2*	*3*	*31*
4+-axle:			*8*	*1*	*9*	*2*	*6*	*8*	*82*
- Net Truck Trips[2]			*14*	*3*	*17*	*4*	*11*	*15*	*150*
BUILDING 9A + 9B + 10 TOTAL NET TRIPS (PCE)[3]			***111***	***20***	***130***	***31***	***86***	***117***	***1,157***
Buildings A-J (Business Park)	140.000	TSF							
Passenger Cars:			145	26	171	40	113	153	1,515
Truck Trips:									
2-axle:			*8*	*1*	*9*	*2*	*6*	*8*	*84*
3-axle:			*9*	*2*	*10*	*2*	*7*	*9*	*93*
4+-axle:			*35*	*6*	*42*	*10*	*28*	*38*	*371*
- Net Truck Trips[2]			*52*	*9*	*62*	*15*	*41*	*56*	*548*
BUILDINGS A-J TOTAL NET TRIPS (PCE)[3]			***197***	***35***	***232***	***55***	***154***	***209***	***2,063***
Total (Phase 3)			***396***	***73***	***469***	***114***	***339***	***453***	***4,217***
Total (Project Buildout)			***806***	***154***	***960***	***217***	***758***	***975***	***9,144***

[1] TSF = thousand square feet

[2] Warehouse Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 150, August 2003. PCE rates are per SANBAG.

[3] TOTAL NET TRIPS (PCE) = Passenger Cars + Net Truck Trips (PCE).

Project Trip Generation Summary (Actual Vehicles)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 1									
Building 6 (Warehouse)	185.000	TSF							
Passenger Cars:			35	9	44	12	35	47	524
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*23*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*31*
4+-axle:			*5*	*1*	*7*	*2*	*5*	*7*	*81*
- Net Truck Trips[2]			*9*	*2*	*11*	*3*	*9*	*12*	*135*
BUILDING 6 TOTAL NET TRIPS (PCE)[3]			***44***	***11***	***56***	***15***	***44***	***59***	***659***
Building 7 (Warehouse)	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	567
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*25*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*33*
4+-axle:			*6*	*1*	*7*	*2*	*6*	*8*	*88*
- Net Truck Trips[2]			*10*	*2*	*12*	*3*	*10*	*13*	*145*
BUILDING 7 TOTAL NET TRIPS[3]			***48***	***12***	***60***	***16***	***48***	***64***	***712***
Building 8 (Warehouse)	130.000	TSF							
Passenger Cars:			25	6	31	8	25	33	368
Truck Trips:									
2-axle:			*1*	*0*	*1*	*0*	*1*	*1*	*16*
3-axle:			*1*	*0*	*2*	*0*	*1*	*2*	*21*
4+-axle:			*4*	*1*	*5*	*1*	*4*	*5*	*57*
- Net Truck Trips[2]			*6*	*2*	*8*	*2*	*6*	*8*	*95*
BUILDING 8 TOTAL NET TRIPS[3]			***31***	***8***	***39***	***10***	***31***	***42***	***463***
Total (Phase 1)			***124***	***31***	***155***	***41***	***124***	***165***	***1,833***
Phase 2									
Building 3 (General Light Industrial)	80.000	TSF							
Passenger Cars:			51	7	58	8	53	61	438
Truck Trips:									
2-axle:			*5*	*1*	*6*	*1*	*5*	*6*	*45*
3-axle:			*3*	*0*	*3*	*0*	*3*	*3*	*22*
4+-axle:			*6*	*1*	*7*	*1*	*6*	*7*	*53*
- Net Truck Trips[2]			*14*	*2*	*16*	*2*	*15*	*17*	*119*
BUILDING 3 TOTAL NET TRIPS[3]			***65***	***9***	***74***	***10***	***68***	***78***	***558***
Building 4 (General Light Industrial)	100.000	TSF							
Passenger Cars:			64	9	72	9	67	76	548
Truck Trips:									
2-axle:			*6*	*1*	*7*	*1*	*7*	*8*	*56*
3-axle:			*3*	*0*	*4*	*0*	*3*	*4*	*27*
4+-axle:			*8*	*1*	*9*	*1*	*8*	*9*	*66*
- Net Truck Trips[2]			*17*	*2*	*20*	*3*	*18*	*21*	*149*
BUILDING 4 TOTAL NET TRIPS[3]			***81***	***11***	***92***	***12***	***85***	***97***	***697***
Building 5 (Warehouse)	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	567
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*25*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*33*
4+-axle:			*6*	*1*	*7*	*2*	*6*	*8*	*88*
- Net Truck Trips[2]			*10*	*2*	*12*	*3*	*10*	*13*	*145*
BUILDING 5 TOTAL NET TRIPS[3]			***48***	***12***	***60***	***16***	***48***	***64***	***712***
Total (Phase 2)			***194***	***32***	***226***	***38***	***201***	***239***	***1,967***
Total (Phase 1+2)			***317***	***63***	***380***	***79***	***325***	***403***	***3,800***

Project Trip Generation Summary (Actual Vehicles)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 3 (Buildout)									
Building 1 (General Light Industrial)	75.000	TSF							
Passenger Cars:			48	6	54	7	50	57	411
Truck Trips:									
2-axle:			*5*	*1*	*6*	*1*	*5*	*6*	*42*
3-axle:			*2*	*0*	*3*	*0*	*2*	*3*	*20*
4+-axle:			*6*	*1*	*7*	*1*	*6*	*7*	*50*
- Net Truck Trips[2]			*13*	*2*	*15*	*2*	*14*	*16*	*112*
BUILDING 1 TOTAL NET TRIPS[3]			***61***	***8***	***69***	***9***	***64***	***73***	***523***
Building 2 (Self Storage)	110.000	TSF							
Passenger Cars:			7	6	13	12	12	24	234
Truck Trips:									
2-axle:			*0*	*0*	*1*	*1*	*1*	*1*	*10*
3-axle:			*0*	*0*	*0*	*0*	*0*	*1*	*8*
4+-axle:			*1*	*1*	*1*	*1*	*1*	*2*	*23*
- Net Truck Trips[2]			*1*	*1*	*2*	*2*	*2*	*4*	*41*
BUILDING 2 TOTAL NET TRIPS[3]			***9***	***7***	***15***	***14***	***14***	***29***	***275***
Buildings 9A+9B+10+11 (Business Park)	93.000	TSF							
Passenger Cars:			96	17	113	27	75	102	1,007
Truck Trips:									
2-axle:			*4*	*1*	*4*	*1*	*3*	*4*	*37*
3-axle:			*3*	*1*	*3*	*1*	*2*	*3*	*31*
4+-axle:			*8*	*1*	*9*	*2*	*6*	*8*	*82*
- Net Truck Trips[2]			*14*	*3*	*17*	*4*	*11*	*15*	*150*
BUILDING 9A+9B+10+11 TOTAL NET TRIPS[3]			***111***	***20***	***130***	***31***	***86***	***117***	***1,157***
Buildings A-J (Business Park)	140.000	TSF							
Passenger Cars:			145	26	171	40	113	153	1,515
Truck Trips:									
2-axle:			*5*	*1*	*6*	*1*	*4*	*6*	*56*
3-axle:			*4*	*1*	*5*	*1*	*3*	*5*	*47*
4+-axle:			*12*	*2*	*14*	*3*	*9*	*13*	*124*
- Net Truck Trips[2]			*22*	*4*	*25*	*6*	*17*	*23*	*226*
BUILDINGS A-J TOTAL NET TRIPS[3]			***167***	***29***	***196***	***46***	***130***	***176***	***1,741***
Total (Phase 3)			***347***	***64***	***411***	***100***	***295***	***395***	***3,696***
Total (Project Buildout)			***664***	***126***	***791***	***179***	***619***	***798***	***7,496***

[1] TSF = thousand square feet

[2] Warehouse Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 150, August 2003.

[3] TOTAL NET TRIPS = Passenger Cars + Net Truck Trips.

Table 4
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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
City of Chino				
C1a	Bickmore Street Residential	SFDR	196	DU
C1b	TM 17611	SFDR	21	DU
C1c	TM 17612	SFDR	42	DU
C1d	TM17635	SFDR	67	DU
C1e	Bouma Residential	SFDR	106	DU
		Condo/Townhouse	94	DU
C1f	Kimball Business Park	Light Industrial	140.500	TSF
		Warehousing	564.000	TSF
		High-Cube Warehouse	352.000	TSF
		Business Park	146.550	TSF
C2	TM17574	Condo/Townhouse	108	DU
C3	Falloncrest at the Preserve	SFDR	204	DU
		Condo/Townhouse	786	DU
		Apartments	412	DU
		Shopping Center	77.597	TSF
		General Office	77.597	TSF
C4a	West Preserve (Barthelemy Project)	SFDR	193	DU
		Condo/Townhouse	198	DU
		Apartments	288	DU
		Youth Soccer	1	Field
C4b	TM18778	SFDR	65	DU
C5	PL11-0047	Apartments	135	DU
	TM 18873	Condo/Townhouse	149	DU
	TM 16838-2 PA 7B	SFDR	67	DU
C6	TM17898	SFDR	77	DU
	TM 17899	SFDR	66	DU
	PL 13-0435	SFDR	41	DU
C7	TM18848	Condo/Townhouse	101	DU
C8	TM17891	SFDR	75	DU
	TM 17890	SFDR	94	DU
	TM 18891	SFDR	118	DU
	TM 17892	SFDR	63	DU
	TM 17893	SFDR	34	DU
	TM 17894	SFDR	39	DU
	TM 17895	SFDR	19	DU
	TM 17896	SFDR	67	DU
	TM 17897	SFDR	93	DU
C9	PL11-0299	General Light Industrial	50.000	TSF
	PL13-0601	SFDR	209	DU
C10	PL10-0544	General Light Industrial	303.300	TSF
C11	Majestic Airport Center	High-Cube Warehouse	2,890.400	TSF
		Warehousing	180.000	TSF
		Specialty Retail	25.000	TSF
		Pharmacy/Drugstore with Drive-Thru	13.000	TSF
		Fast-Food with Drive-Thru	8.600	TSF
	Chino West Industrial	Warehousing	127.052	TSF
		High-Cube Warehouse	942.325	TSF

Table 4
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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
C12	PM18635	General Light Industrial	99.164	TSF
		High-Cube Warehouse	2,077.594	TSF
C13a	TM16420-1	Apartments	799	DU
C13b	TM 18890	Condo/Townhouse	94	DU
C13c	Lewis Residential	Apartments	800	DU
C14a	PM19368 (Chino East Industrial)	General Light Industrial	1,593.500	TSF
C14b	Watson Industrial Park	High-Cube Warehouse	3,889.900	TSF
C15a	PL 08-0334	Manufacturing	421.031	TSF
C15b	Hillwood @ Monte Vista Av./Schaefer Av.	Industrial	409.000	TSF
C15c	PL 10-0726	General Office	13.672	TSF
C15d	Yorba Avenue Commerce Center	High-Cube Warehouse	256.000	TSF
C16a	TM 18880	SFDR	33	DU
C16b	SEC Philadelphia/Ramona	Shopping Center	27.000	TSF
C16c	Chino Central Residential (PL13-0618)	SFDR	94	DU
	Central and Francis Residential	SFDR	113	DU
C16d	Pipeline and Norton Residential	SFDR	45	DU
C17	Brewart Residential	SFDR	127	DU
C18	Fern and Riverside Residential	SFDR	94	DU
C19a	Chino Riverside Residential	SFDR	59	DU
C19b	Borba Chino Residential	SFDR	84	DU
C20	Edgewater Communities	SFDR	415	DU
		Condo/Townhouse	659	DU
		Museum/Retail	6.500	TSF
		Church	15.200	TSF
		Park	15.0	AC
C21	Carson Industrial El Prado	High-Cube Warehouse	442.363	TSF
	Carson Mountain Industrial	High-Cube Warehouse	227.977	TSF
C22	Mill Creek	SFDR	1,074	DU
C23	DR Horton Brewer	SFDR	191	DU
C24a	Church	Church	47.979	TSF
		Daycare	190	STU
C24b	Flores Site	Shopping Center	4.000	TSF
		Gas Station w/ convenience store	16	VFP
		Express Car Wash	5.000	TSF
C25	South of Pine	SFDR	1,351	DU
		Condo/Townhouse	732	DU
		Apartments	670	DU
City of Chino Hills				
CH1	Country Club Villas	Condo/Townhouse	46	DU
CH2	Lago Los Serranos	Condo/Townhouse	95	DU
CH3	The Commons	Shopping Center	150.000	DU
CH4	The Golden Triangle	Shopping Center	106.700	TSF
CH5	Heritage Professional Center	Hospital	55.000	TSF
		Medical Office Building	86.952	TSF
		Hotel	120	RM
		Shopping Center	38.848	TSF
		Restaurant	7.200	TSF
CH6	Vista Bella Townhomes	Condo/Townhouse	65	DU

Table 4
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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
CH7	Higgins Business Park	Business Park	338.682	TSF
		General Office	40.000	TSF
		Specialty Retail	10.000	TSF
		Bank with Drive-Thru	3.000	TSF
		Fast-Food with Drive-Thru	3.000	TSF
		Gas Station w/ convenience store and car wash	10	VFP
CH8	Vila Borba Specific Plan	SFDR	351	DU
City of Eastvale				
E1	Eastvale Gateway South	Shopping Center	20.132	TSF
E2	10-0117 (TM36373)	SFDR	51	DU
E3	10-0271 - Eastvale Commerce Center (Phase 1 and 2)	Shopping Center	249.000	TSF
		Hotel	130	RM
		High Cube Warehouse	3,100.000	TSF
		Business Park	610.000	TSF
E4	11-0354 - Arco Gas Station	Gas Station w/ convenience store and car wash	18.000	VFP
		Fast-Food w/o Drive-Thru	2.800	TSF
		Fast-Food with Drive-Thru	2.100	TSF
E5	The Marketplace at Enclave	Coffee/Donut Shop w/ Drive Thru	1.600	TSF
		Shopping Center	42.000	TSF
E6	TR30896	SFDR	73	DU
E7	11-0363 TTM 36382 (Altfillisch Residential Project[5])	SFDR	146	DU
E8	SP00358 - The Ranch at Eastvale	Shopping Center	267.200	TSF
		General Light Industrial	801.500	TSF
		Business Park	1,121.100	TSF
E9	11-0366 - Eastvale South[3]	Medical-Dental Office Building	70.000	TSF
E10	13-0395 - 65th Street Residential (Copper Sky)	SFDR	250	DU
E11	PP23219 (PM35865)	General Light Industrial	738.430	TSF
E12	Dairy Property	SFDR	119	DU
E13	TR35751	Condo/Townhouse	243	DU
E14	13-0632 - Sumner Residential (Stratham Homes)	SFDR	129	DU
E15	11-0558 - TR34014 (The Trails)	SFDR	224	DU
E16	TR32821	Condo/Townhouse	350	DU
E17	TR32909	SFDR	140	DU
E18	10-0124 - TR31252 (The Lodge)	SFDR	205	DU
E19	TR29997	SFDR	122	DU
E20	14-0046 - Kasbergen/William Lyons Homes	Condo/Townhouse	220	DU
E21	14-0032 - Tio's Mexican Restaurant	High-Turnover (Sit-Down) Restaurant	2.411	TSF
E22	SC Limonite, LLC	SFDR	330	TSF
E23	Eastvale Shopping Center	Free-Standing Discount Superstore	192.000	TSF
		Specialty Retail	9.200	TSF
		Fast-Food Without Drive-Thru	7.200	TSF
		Coffee/Donut Shop w/ Drive Thru	2.000	TSF
		Fast-Food with Drive-Thru	3.500	TSF
		Gas Station w/ convenience store and car wash	16	VFP
E24	14-0081 - LFDC Large Family Day Care (Itsy Bitsy Depot)	Daycare	14	STU
E25	14-0631 - LFDC Large Family Day Care (Eaton Family Day Care)	Daycare	14	STU
E26	14-0783 - LFDC Large Family Day Care (Ling Family Day Care)	Daycare	14	STU
E27	14-1077 - Grainger Site (APN:156-050-025, 156-050-026, 156-020-027)	Industrial	546.000	TSF

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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
City of Jurupa Valley				
JV1	Silverlakes Equestrian[6]	Soccer Field	14	Fields
		Soccer Field	10	Fields
		Equestrian Facility	400	Stalls
JV2	TR33428	SFDR	338	DU
JV3	TR33258	SFDR	45	DU
JV4	CUP03555	Mini-Warehouse	141.460	TSF
JV5	CUP03488 (Self Storage)	Mini-Warehouse	89.642	TSF
JV6	TR35655	SFDR	9	DU
JV7	TR31644	SFDR	213	DU
	TR31768	SFDR	95	DU
	TR31778	SFDR	64	DU
	TR33461	SFDR	102	DU
	Thorobred Farms	High-Cube Warehouse	1,176.120	TSF
JV8	Ter Maaten (TTM No. 36391)	SFDR	468	DU
		Park	8.4	AC
JV9	Riverside Drive Development	General Light Industrial	167.020	TSF
JV10	6316 Wineville Av. (Daycare)	Daycare	40	STU
JV11	Vernola Marketplace Apartments	Apartments	597	DU
JV12	TR36692	SFDR	176	DU
	TR31768	SFDR	189	DU
	TR31778-1	SFDR	128	DU
	TR33461	SFDR	203	DU
	TR31644	SFDR	425	DU
JV13	PP23203	Industrial/Business Park	821.77	TSF
JV14	PP23390	Warehousing	78.31	TSF
JV15	PP23580	Fast-Food with Drive-Thru	1.832	TSF
JV16	PP24596	Warehousing	122.59	TSF
JV17	Galena Business Park (SDP31204)	General Light Industrial	173.39	TSF
JV18	Swift Transportation (ST00934)	General Office	8.000	TSF
City of Ontario				
O1	Countryside	SFDR	819	DU
O2	Edenglen	SFDR	310	DU
		Multi-Family Attached (Condo)	274	DU
		Shopping Center	217.520	TSF
		Business Park	550.000	TSF
O3	Esperanza	SFDR	914	DU
		Multi-Family Attached (Apartments)	496	DU
O4	Grand Park	SFDR	484	DU
		Multi-Family Attached (Apartments)	843	DU
O5	Parkside	SFDR	437	DU
		Multi-Family Attached (Apartments)	1,510	DU
		Shopping Center	115.000	TSF
O6	Rich Haven	SFDR	2,732	DU
		Multi-Family Attached (Condo)	1,524	DU
		Shopping Center	317.400	TSF

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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
O7	Subarea 29 & Amendment	SFDR	2,865	DU
		Shopping Center	87.000	TSF
O8	The Avenue	SFDR	2,020	DU
		Multi-Family Attached (Apartments)	586	DU
		Shopping Center	250.000	TSF
O9	West Haven	SFDR	753	DU
		Shopping Center	87.000	TSF
O10	Tuscana Village	SFDR	176	DU
		Shopping Center	26.000	TSF
O11	PDEV10-011	SFDR	11	DU
O12	PDEV10-008 - Dry Food Storage	Mini-Warehouse	17.000	TSF
O13	PDEV08-008	Shopping Center	3.920	TSF
City of Norco				
N1	Fairfield Inn Hotel	Hotel	96	RM
		High-Turnover (Sit-Down) Restaurant	10.000	TSF
N2	Watermarke Properties	Apartments	450	DU
		Shopping Center	77.000	TSF

[1] SFDR = Single Family Detached Residential

[2] TSF = Ten Thousand Square Feet; DU = Dwelling Unit; VFP = Vehicle Fueling Position ; AC = Acres

[3] Source: Eastvale South Trip Generation Analysis, Albert A. Webb Associates, May 27, 2011

[4] Source: Trip Generation Comparison for Cloverdale Marketplace, Phase II, Eastvale CA, Albert A. Webb Associates, August 15, 2011.

[5] Source: Altfillisch Residential Project TIA Memorandum, LSA Associates, Inc., July 25, 2011.

[6] Source: From Silverlakes TIA (Revised), Kunzman Associates, September 25, 2008.

APPENDIX 1.2:

ROADWAY SEGMENT ANALYSIS

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Table 1.2-1

Roadway Segment Analysis for Exisitng and E+P Conditions

#	Roadway	Segment Limits	Lanes	Existing (2016)						E+P (Phase 1)						E+P (Phase 2)						E+P (Project Buildout)					
				Volume[1]		V/C[2]		Exceeds Capacity?[3]		Volume[1]		V/C[2]		Exceeds Capacity?[3]		Volume[1]		V/C[2]		Exceeds Capacity?[3]		Volume[1]		V/C[2]		Exceeds Capacity?[3]	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Kimball Avenue	Euclid Av. (SR-83) to Mayhew Av.																									
		Westbound:	2	908	365	0.28	0.11	No	No	935	474	0.29	0.15	No	No	963	654	0.30	0.20	No	No	1,008	860	0.32	0.27	No	No
		Eastbound:	2	383	1,057	0.12	0.33	No	No	492	1,093	0.15	0.34	No	No	665	1,126	0.21	0.35	No	No	907	1,198	0.28	0.37	No	No
2		Mayhew Av. to Rincon Meadows Av.																									
		Westbound:	1	1,021	422	0.64	0.26	No	No	1,039	428	0.65	0.27	No	No	1,052	521	0.66	0.33	No	No	1,096	717	0.69	0.45	No	No
		Eastbound:	2	400	1,075	0.13	0.34	No	No	405	1,093	0.13	0.34	No	No	496	1,111	0.16	0.35	No	No	712	1,173	0.22	0.37	No	No
3		Rincon Meadows Av. to Mill Creek Av.																									
		Westbound:	1	1,050	398	0.66	0.25	No	No	1,067	404	0.67	0.25	No	No	1,095	409	0.68	0.26	No	No	1,140	422	0.71	0.26	No	No
		Eastbound:	2	409	1,050	0.13	0.33	No	No	413	1,067	0.13	0.33	No	No	418	1,096	0.13	0.34	No	No	426	1,134	0.13	0.35	No	No
4		Mill Creek Av. to Main St.																									
		Westbound:	1	923	343	0.58	0.21	No	No	939	348	0.59	0.22	No	No	965	353	0.60	0.22	No	No	1,007	366	0.63	0.23	No	No
		Eastbound:	2	370	940	0.12	0.29	No	No	374	956	0.12	0.30	No	No	378	983	0.12	0.31	No	No	386	1,019	0.12	0.32	No	No
5		Main St. to Flight Av.																									
		Westbound:	1	777	312	0.49	0.20	No	No	791	317	0.49	0.20	No	No	814	321	0.51	0.20	No	No	850	332	0.53	0.21	No	No
		Eastbound:	2	337	890	0.11	0.28	No	No	341	904	0.11	0.28	No	No	344	928	0.11	0.29	No	No	351	958	0.11	0.30	No	No
6		Flight Av. to Hellman Av.																									
		Westbound:	1	842	280	0.53	0.18	No	No	848	282	0.53	0.18	No	No	858	284	0.54	0.18	No	No	875	289	0.55	0.18	No	No
		Eastbound:	2	304	860	0.10	0.27	No	No	306	866	0.10	0.27	No	No	307	876	0.10	0.27	No	No	310	890	0.10	0.28	No	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] Peak hour volumes in direction of travel identified on the roadway segment.

[2] V/C = Volume-to-Capacity. Capacity based on 1,600 vehicles per hour per lane, where the capacity for exclusive through lanes (1,800) from the San Bernardino County CMP has been adjusted to account for lane width, heavy vehicles, lane utilization, ped/bike presence, etc.

[3] If the V/C is greater than 1.00, then it has been identified that the segment may potentially exceed capacity. For those locations that are less than 1.10, additional roadway widening may not be necessary if assessment of the adjacent intersections during the peak hours demonstrates acceptable peak hour operations without the need for additional through lanes. This is due to additional turn lanes at the intersections, which provide additional capacity that are not considered along the roadway segment.

Table 1.2-2

Roadway Segment Analysis for Opening Year Cumulative (2018) Conditions

#	Roadway	Segment Limits	Lanes	Opening Year Cumulative (2018) Without Project						Opening Year Cumulative (2018) With Project					
				Volume[1]		V/C[2]		Exceeds Capacity?[3]		Volume[1]		V/C[2]		Exceeds Capacity?[3]	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Kimball Avenue	Euclid Av. (SR-83) to Mayhew Av.													
		Westbound:	2	835	817	0.26	0.26	No	No	862	926	0.27	0.29	No	No
		Eastbound:	2	840	1,181	0.26	0.37	No	No	949	1,217	0.30	0.38	No	No
2		Mayhew Av. to Rincon Meadows Av.													
		Westbound:	1	953	876	0.60	0.55	No	No	971	882	0.61	0.55	No	No
		Eastbound:	2	848	1,187	0.27	0.37	No	No	853	1,205	0.27	0.38	No	No
3		Rincon Meadows Av. to Mill Creek Av.													
		Westbound:	1	949	851	0.59	0.53	No	No	966	857	0.60	0.54	No	No
		Eastbound:	2	870	1,132	0.27	0.35	No	No	874	1,149	0.27	0.36	No	No
4		Mill Creek Av. to Main St.													
		Westbound:	1	820	809	0.51	0.51	No	No	836	814	0.52	0.51	No	No
		Eastbound:	2	845	1,025	0.26	0.32	No	No	849	1,041	0.27	0.33	No	No
5		Main St. to Flight Av.													
		Westbound:	1	666	780	0.42	0.49	No	No	680	785	0.43	0.49	No	No
		Eastbound:	2	814	973	0.25	0.30	No	No	818	987	0.26	0.31	No	No
6		Flight Av. to Hellman Av.													
		Westbound:	1	584	513	0.37	0.32	No	No	590	515	0.37	0.32	No	No
		Eastbound:	2	520	745	0.16	0.23	No	No	522	751	0.16	0.23	No	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] Peak hour volumes in direction of travel identified on the roadway segment.

[2] V/C = Volume-to-Capacity. Capacity based on 1,600 vehicles per hour per lane, where the capacity for exclusive through lanes (1,800) from the San Bernardino County CMP has been adjusted to account for lane width, heavy vehicles, lane utilization, ped/bike presence, etc.

[3] If the V/C is greater than 1.00, then it has been identified that the segment may potentially exceed capacity. For those locations that are less than 1.10, additional roadway widening may not be necessary if assessment of the adjacent intersections during the peak hours demonstrates acceptable peak hour operations without the need for additional through lanes. This is due to additional turn lanes at the intersections, which provide additional capacity that are not considered along the roadway segment.

Table 1.2-3

Roadway Segment Analysis for Opening Year Cumulative (2019) Conditions

#	Roadway	Segment Limits	Lanes	Opening Year Cumulative (2019) Without Project						Opening Year Cumulative (2019) With Project					
				Volume[1]		V/C[2]		Exceeds Capacity?[3]		Volume[1]		V/C[2]		Exceeds Capacity?[3]	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Kimball Avenue	Euclid Av. (SR-83) to Mayhew Av.													
		Westbound:	2	846	823	0.26	0.26	No	No	901	1,112	0.28	0.35	No	No
		Eastbound:	2	845	1,197	0.26	0.37	No	No	1,127	1,266	0.35	0.40	No	No
2		Mayhew Av. to Rincon Meadows Av.													
		Westbound:	1	966	882	0.60	0.55	No	No	997	981	0.62	0.61	No	No
		Eastbound:	2	854	1,203	0.27	0.38	No	No	950	1,239	0.30	0.39	No	No
3		Rincon Meadows Av. to Mill Creek Av.													
		Westbound:	1	962	857	0.60	0.54	No	No	1,007	868	0.63	0.54	No	No
		Eastbound:	2	875	1,148	0.27	0.36	No	No	884	1,194	0.28	0.37	No	No
4		Mill Creek Av. to Main St.													
		Westbound:	1	832	805	0.52	0.50	No	No	874	815	0.55	0.51	No	No
		Eastbound:	2	850	1,039	0.27	0.32	No	No	858	1,082	0.27	0.34	No	No
5		Main St. to Flight Av.													
		Westbound:	1	675	784	0.42	0.49	No	No	712	793	0.45	0.50	No	No
		Eastbound:	2	819	985	0.26	0.31	No	No	826	1,023	0.26	0.32	No	No
6		Flight Av. to Hellman Av.													
		Westbound:	1	593	516	0.37	0.32	No	No	609	520	0.38	0.33	No	No
		Eastbound:	2	524	757	0.16	0.24	No	No	527	773	0.16	0.24	No	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] Peak hour volumes in direction of travel identified on the roadway segment.

[2] V/C = Volume-to-Capacity. Capacity based on 1,600 vehicles per hour per lane, where the capacity for exclusive through lanes (1,800) from the San Bernardino County CMP has been adjusted to account for lane width, heavy vehicles, lane utilization, ped/bike presence, etc.

[3] If the V/C is greater than 1.00, then it has been identified that the segment may potentially exceed capacity. For those locations that are less than 1.10, additional roadway widening may not be necessary if assessment of the adjacent intersections during the peak hours demonstrates acceptable peak hour operations without the need for additional through lanes. This is due to additional turn lanes at the intersections, which provide additional capacity that are not considered along the roadway segment.

Table 1.2-4

Roadway Segment Analysis for Opening Year Cumulative (2020) Conditions

#	Roadway	Segment Limits	Lanes	Opening Year Cumulative (2020) Without Project						Opening Year Cumulative (2020) With Project					
				Volume[1]		V/C[2]		Exceeds Capacity?[3]		Volume[1]		V/C[2]		Exceeds Capacity?[3]	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Kimball Avenue	Euclid Av. (SR-83) to Mayhew Av.													
		Westbound:	2	856	828	0.27	0.26	No	No	956	1,323	0.30	0.41	No	No
		Eastbound:	2	851	1,215	0.27	0.38	No	No	1,375	1,356	0.43	0.42	No	No
2		Mayhew Av. to Rincon Meadows Av.													
		Westbound:	1	979	889	0.61	0.56	No	No	1,054	1,184	0.66	0.74	No	No
		Eastbound:	2	860	1,220	0.27	0.38	No	No	1,172	1,318	0.37	0.41	No	No
3		Rincon Meadows Av. to Mill Creek Av.													
		Westbound:	1	976	862	0.61	0.54	No	No	1,066	886	0.67	0.55	No	No
		Eastbound:	2	882	1,164	0.28	0.36	No	No	899	1,248	0.28	0.39	No	No
4		Mill Creek Av. to Main St.													
		Westbound:	1	842	819	0.53	0.51	No	No	926	842	0.58	0.53	No	No
		Eastbound:	2	855	1,054	0.27	0.33	No	No	871	1,133	0.27	0.35	No	No
5		Main St. to Flight Av.													
		Westbound:	1	683	788	0.43	0.49	No	No	756	808	0.47	0.51	No	No
		Eastbound:	2	824	999	0.26	0.31	No	No	838	1,067	0.26	0.33	No	No
6		Flight Av. to Hellman Av.													
		Westbound:	1	602	519	0.38	0.32	No	No	635	528	0.40	0.33	No	No
		Eastbound:	2	528	769	0.17	0.24	No	No	534	799	0.17	0.25	No	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] Peak hour volumes in direction of travel identified on the roadway segment.

[2] V/C = Volume-to-Capacity. Capacity based on 1,600 vehicles per hour per lane, where the capacity for exclusive through lanes (1,800) from the San Bernardino County CMP has been adjusted to account for lane width, heavy vehicles, lane utilization, ped/bike presence, etc.

[3] If the V/C is greater than 1.00, then it has been identified that the segment may potentially exceed capacity. For those locations that are less than 1.10, additional roadway widening may not be necessary if assessment of the adjacent intersections during the peak hours demonstrates acceptable peak hour operations without the need for additional through lanes. This is due to additional turn lanes at the intersections, which provide additional capacity that are not considered along the roadway segment.

Table 1.2-5

ADT-Based Roadway Segment Analysis for Exisitng and E+P Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	Existing 2016	V/C[2]	LOS[3]	E+P Phase 1	V/C[2]	LOS[3]	E+P Phase 2	V/C[2]	LOS[3]	E+P Phase 3	V/C[2]	LOS[3]
1	Kimball Av.	Euclid Av. (SR-83) to Mayhew Av.	4D	30,000	18,134	0.60	B	19,734	0.66	B	21,495	0.72	C	24,088	0.80	D
2		Mayhew Av. to Rincon Meadows Av.	3D/**4D**	30,000	19,085	0.80	C	19,351	0.65	D	20,353	0.68	D	22,779	0.76	C
3		Rincon Meadows Av. to Mill Creek Av.	3D	24,000	18,466	0.77	C	18,718	0.78	C	18,996	0.79	C	19,480	0.81	D
4		Mill Creek Av. to Main St.	3D	24,000	16,361	0.68	B	16,597	0.69	B	16,861	0.70	C	17,313	0.72	C
5		Main St. to Flight Av.	3D	24,000	11,843	0.49	A	12,051	0.50	A	12,281	0.51	A	12,671	0.53	A
6		Flight Av. to Hellman Av.	3D	24,000	14,530	0.61	B	14,618	0.61	B	14,716	0.61	B	14,900	0.62	B

[1] These maximum roadway capacities have been obtained from the City of Chino's General Plan (Table TRA-3).

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

Table 1.2-6

ADT-Based Roadway Segment Analysis for Opening Year Cumulative Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	2018 NP	V/C[2]	LOS[3]	2018 WP	V/C[2]	LOS[3]	2019 NP	V/C[2]	LOS[3]	2019 WP	V/C[2]	LOS[3]	2020 NP	V/C[2]	LOS[3]	2020 WP	V/C[2]	LOS[3]
1	Kimball Av.	Euclid Av. (SR-83) to Mayhew Av.	4D	30,000	**30,456**	**1.02**	**F**	**32,056**	**1.07**	**F**	**30,833**	**1.03**	**F**	**34,194**	**1.14**	**F**	**31,218**	**1.04**	**F**	**37,172**	**1.24**	**F**
2		Mayhew Av. to Rincon Meadows Av.	3D/**4D**	30,000	**31,236**	**1.04**	**F**	**31,502**	**1.05**	**F**	**31,633**	**1.05**	**F**	**32,901**	**1.10**	**F**	**32,038**	**1.07**	**F**	**35,732**	**1.19**	**F**
3		Rincon Meadows Av. to Mill Creek Av.	3D	24,000	**30,208**	**1.26**	**F**	**30,460**	**1.27**	**F**	**30,592**	**1.27**	**F**	**31,122**	**1.30**	**F**	**30,984**	**1.29**	**F**	**31,998**	**1.33**	**F**
4		Mill Creek Av. to Main St.	3D	24,000	**28,220**	**1.18**	**F**	**28,456**	**1.19**	**F**	**28,560**	**1.19**	**F**	**29,060**	**1.21**	**F**	**28,908**	**1.20**	**F**	**29,860**	**1.24**	**F**
5		Main St. to Flight Av.	3D	24,000	**23,445**	**0.98**	**E**	**23,653**	**0.99**	**E**	**23,692**	**0.99**	**F**	**24,130**	**1.01**	**F**	**23,943**	**1.00**	**E**	**24,771**	**1.03**	**F**
6		Flight Av. to Hellman Av.	3D	24,000	21,174	0.88	D	21,262	0.89	D	21,476	0.89	D	**21,662**	**0.90**	**E**	**21,785**	**0.91**	**E**	**22,155**	**0.92**	**E**

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] These maximum roadway capacities have been obtained from the City of Chino's General Plan (Table TRA-3).

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

Table 1.2-7

ADT-Based Roadway Segment Analysis for Horizon Year Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	2040 NP w/o Limonite	V/C[2]	LOS[3]	2040 WP w/o Limonite	V/C[2]	LOS[3]	2040 NP w/ Limonite	V/C[2]	LOS[3]	2040 WP w/ Limonite	V/C[2]	LOS[3]
1	Kimball Av.	Euclid Av. (SR-83) to Mayhew Av.	4D	30,000	21,690	0.72	C	**27,652**	**0.92**	**E**	21,690	0.72	C	**27,346**	**0.91**	**E**
2		Mayhew Av. to Rincon Meadows Av.	3D/**4D**	30,000	22,571	0.75	C	26,263	0.88	D	22,571	0.75	C	26,269	0.88	D
3		Rincon Meadows Av. to Mill Creek Av.	3D	24,000	**26,102**	**1.09**	**F**	**27,116**	**1.13**	**F**	**27,062**	**1.13**	**F**	**28,372**	**1.18**	**F**
			4D	30,000		0.87	D		**0.90**	**E**		**0.90**	**E**		**0.95**	**E**
4		Mill Creek Av. to Main St.	3D	24,000	**28,233**	**1.18**	**F**	**29,185**	**1.22**	**F**	**33,035**	**1.38**	**F**	**34,283**	**1.43**	**F**
			4D	30,000		**0.94**	**E**		**0.97**	**E**		**1.10**	**F**		**1.14**	**F**
5		Main St. to Flight Av.	3D	24,000	**40,615**	**1.69**	**F**	**41,443**	**1.73**	**F**	**45,417**	**1.89**	**F**	**46,603**	**1.94**	**F**
			4D	30,000		**1.35**	**F**		**1.38**	**F**		**1.51**	**F**		**1.55**	**F**
6		Flight Av. to Hellman Av.	3D	24,000	14,827	0.62	B	15,197	0.63	B	**24,431**	**1.02**	**F**	**25,283**	**1.05**	**F**
			4D	30,000		0.49	A		0.51	A		0.81	D		0.84	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS). **4D** = Improvement

[1] These maximum roadway capacities have been obtained from the City of Chino's General Plan (Table TRA-3).

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

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APPENDIX 1.3:

SITE ADJACENT QUEUES

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Intersection: 28: Bickmore Av. & Dwy. 1

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	22
Link Distance (ft)	278
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 29: Bickmore Av. & Dwy. 2

Movement	WB	SB
Directions Served	TR	R
Maximum Queue (ft)	6	30
Average Queue (ft)	0	3
95th Queue (ft)	4	18
Link Distance (ft)	275	144
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: Mayhew Av. & Kimball Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	174	170	63	56	144	144	64	25
Average Queue (ft)	80	77	33	16	64	61	21	2
95th Queue (ft)	136	137	55	44	122	126	52	11
Link Distance (ft)	1227	1227			292	292		139
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			300	300			200	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 31: Mayhew Av. & Dwy. 3

Movement	EB
Directions Served	R
Maximum Queue (ft)	28
Average Queue (ft)	3
95th Queue (ft)	18
Link Distance (ft)	69
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 32: Mayhew Av. & Dwy. 4

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	34	24
Average Queue (ft)	10	1
95th Queue (ft)	33	11
Link Distance (ft)	76	65
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 33: Mayhew Av. & Dwy. 5

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	27	6
Average Queue (ft)	3	0
95th Queue (ft)	18	4
Link Distance (ft)	100	30
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 34: Mayhew Av. & Dwy. 6

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	28	25
Average Queue (ft)	4	2
95th Queue (ft)	21	13
Link Distance (ft)	55	268
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 35: Mayhew Av. & Dwy. 7

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	19	12
Average Queue (ft)	1	0
95th Queue (ft)	9	6
Link Distance (ft)	299	268
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 36: Mayhew Av. & Dwy. 8

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	31	31
Average Queue (ft)	7	8
95th Queue (ft)	28	29
Link Distance (ft)	348	25
Upstream Blk Time (%)		1
Queuing Penalty (veh)		1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 37: Mayhew Av. & Dwy. 9

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	31	31
Average Queue (ft)	8	2
95th Queue (ft)	30	14
Link Distance (ft)	278	335
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 38: Mayhew Av. & Dwy. 10

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	36	12
Average Queue (ft)	7	1
95th Queue (ft)	28	9
Link Distance (ft)	532	268
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 39: Mayhew Av. & Dwy. 11

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	31	6
Average Queue (ft)	3	0
95th Queue (ft)	19	4
Link Distance (ft)	500	12
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: Mayhew Av. & Dwy. 12

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	30	39	11
Average Queue (ft)	7	3	0
95th Queue (ft)	29	18	8
Link Distance (ft)	302	119	12
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 41: Mayhew Av. & Dwy. 13

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	31	16
Average Queue (ft)	5	1
95th Queue (ft)	22	11
Link Distance (ft)	264	117
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 42: Bickmore Av. & Mayhew Av.

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	112	17	25	37
Average Queue (ft)	54	1	4	11
95th Queue (ft)	95	6	19	29
Link Distance (ft)				117
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300	300	100	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 43: Dwy. 14 & Kimball Av.

Movement	NB
Directions Served	R
Maximum Queue (ft)	22
Average Queue (ft)	3
95th Queue (ft)	16
Link Distance (ft)	96
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 44: Street B/Firehouse Dwy. & Kimball Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	T	LTR	LTR
Maximum Queue (ft)	24	195	195	149	75	201	161	79	4
Average Queue (ft)	2	81	79	45	29	63	47	36	0
95th Queue (ft)	13	167	164	97	67	145	120	71	3
Link Distance (ft)		352	352			472	472	99	175
Upstream Blk Time (%)								0	
Queuing Penalty (veh)								0	
Storage Bay Dist (ft)	125			150	300				
Storage Blk Time (%)		3	2						
Queuing Penalty (veh)		0	4						

Intersection: 45: Street B & Dwy. 15

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	30	28	6	18
Average Queue (ft)	7	6	0	1
95th Queue (ft)	27	24	5	11
Link Distance (ft)	193	59	62	99
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 46: Street B & Dwy. 16

Movement	EB
Directions Served	LR
Maximum Queue (ft)	18
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	344
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 47: Dwy. 17/Street B & Dwy. 18

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	39	30
Average Queue (ft)	20	2
95th Queue (ft)	44	15
Link Distance (ft)	116	175
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 48: Dwy. 19 & Kimball Av.

Movement	NB
Directions Served	R
Maximum Queue (ft)	27
Average Queue (ft)	3
95th Queue (ft)	15
Link Distance (ft)	234
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 5

Intersection: 28: Bickmore Av. & Dwy. 1

Movement	SB
Directions Served	R
Maximum Queue (ft)	49
Average Queue (ft)	17
95th Queue (ft)	44
Link Distance (ft)	278
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 29: Bickmore Av. & Dwy. 2

Movement	SB
Directions Served	R
Maximum Queue (ft)	40
Average Queue (ft)	17
95th Queue (ft)	43
Link Distance (ft)	144
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 30: Mayhew Av. & Kimball Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	224	201	35	31	261	263	131	102
Average Queue (ft)	111	90	10	5	108	117	79	13
95th Queue (ft)	191	173	31	22	214	211	122	54
Link Distance (ft)	1227	1227			292	292		139
Upstream Blk Time (%)					0	0	1	0
Queuing Penalty (veh)					0	1	0	0
Storage Bay Dist (ft)			300	300			200	
Storage Blk Time (%)					0		1	0
Queuing Penalty (veh)					0		0	0

Intersection: 31: Mayhew Av. & Dwy. 3

Movement	EB	NB
Directions Served	R	T
Maximum Queue (ft)	43	10
Average Queue (ft)	18	0
95th Queue (ft)	42	7
Link Distance (ft)	69	65
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 32: Mayhew Av. & Dwy. 4

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	69	18	31
Average Queue (ft)	29	1	3
95th Queue (ft)	54	8	17
Link Distance (ft)	76	30	65
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 33: Mayhew Av. & Dwy. 5

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	32	6
Average Queue (ft)	15	0
95th Queue (ft)	38	4
Link Distance (ft)	100	30
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 34: Mayhew Av. & Dwy. 6

Movement	EB
Directions Served	LR
Maximum Queue (ft)	37
Average Queue (ft)	13
95th Queue (ft)	37
Link Distance (ft)	55
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 35: Mayhew Av. & Dwy. 7

Movement	WB
Directions Served	LR
Maximum Queue (ft)	24
Average Queue (ft)	7
95th Queue (ft)	24
Link Distance (ft)	299
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 36: Mayhew Av. & Dwy. 8

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	53	6
Average Queue (ft)	23	0
95th Queue (ft)	48	4
Link Distance (ft)	348	25
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 37: Mayhew Av. & Dwy. 9

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	43	18
Average Queue (ft)	24	1
95th Queue (ft)	46	8
Link Distance (ft)	278	335
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 38: Mayhew Av. & Dwy. 10

Movement	EB
Directions Served	LR
Maximum Queue (ft)	44
Average Queue (ft)	20
95th Queue (ft)	45
Link Distance (ft)	532
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 39: Mayhew Av. & Dwy. 11

Movement	EB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	15
95th Queue (ft)	40
Link Distance (ft)	500
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: Mayhew Av. & Dwy. 12

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	49	19	6
Average Queue (ft)	24	1	0
95th Queue (ft)	47	12	4
Link Distance (ft)	302	119	12
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 41: Mayhew Av. & Dwy. 13

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	35	25
Average Queue (ft)	15	1
95th Queue (ft)	40	10
Link Distance (ft)	264	117
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 42: Bickmore Av. & Mayhew Av.

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	49	29	48
Average Queue (ft)	9	15	23
95th Queue (ft)	34	35	38
Link Distance (ft)			117
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	300	100	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 43: Dwy. 14 & Kimball Av.

Movement	EB	EB	WB	WB	NB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	84	89	47	50	44
Average Queue (ft)	6	6	2	2	16
95th Queue (ft)	48	49	20	20	38
Link Distance (ft)	292	292	352	352	96
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 44: Street B/Firehouse Dwy. & Kimball Av.

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	T	T	R	L	T	T	LTR
Maximum Queue (ft)	355	365	228	54	291	276	114
Average Queue (ft)	171	172	37	9	118	100	98
95th Queue (ft)	336	330	142	31	227	208	130
Link Distance (ft)	352	352			472	472	99
Upstream Blk Time (%)	1	1					14
Queuing Penalty (veh)	8	8					46
Storage Bay Dist (ft)			150	300			
Storage Blk Time (%)	14	11			0	0	
Queuing Penalty (veh)	0	8			0	0	

Intersection: 45: Street B & Dwy. 15

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	67	57	74	35
Average Queue (ft)	26	25	23	4
95th Queue (ft)	54	50	68	20
Link Distance (ft)	193	59	62	99
Upstream Blk Time (%)		0	2	
Queuing Penalty (veh)		0	4	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 46: Street B & Dwy. 16

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	31	73
Average Queue (ft)	3	6
95th Queue (ft)	19	37
Link Distance (ft)	344	175
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 47: Dwy. 17/Street B & Dwy. 18

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	72	31
Average Queue (ft)	39	2
95th Queue (ft)	61	15
Link Distance (ft)	116	175
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 48: Dwy. 19 & Kimball Av.

Movement	NB
Directions Served	R
Maximum Queue (ft)	44
Average Queue (ft)	13
95th Queue (ft)	37
Link Distance (ft)	234
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 76

APPENDIX 3.1:

EXISTING TRAFFIC COUNTS – MAY 2016

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INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

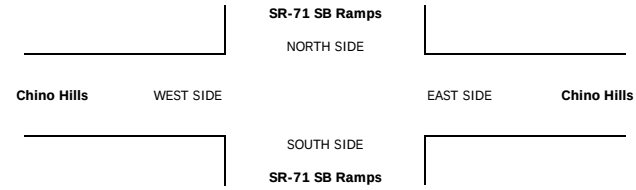
DATE:	LOCATION:	Chino	PROJECT #:	SC0952
Wed, May 18, 16	NORTH & SOUTH:	SR-71 SB Ramps	LOCATION #:	1
	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

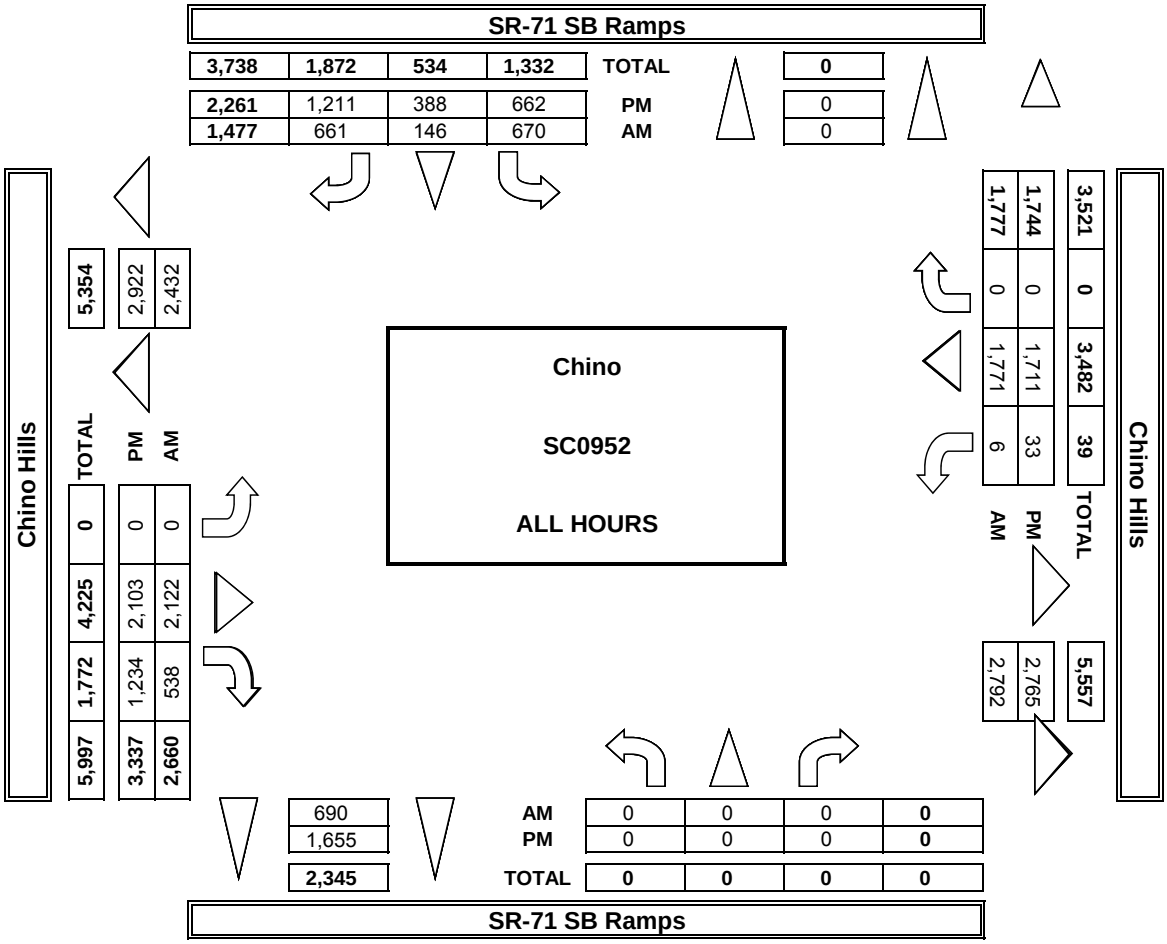
		NORTHBOUND (SR-71 SB Ramps)			SOUTHBOUND (SR-71 SB Ramps)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)				U-TURNS					RTOR			
	LANES:	NL X	NT X	NR X	SL 1.5	ST 0.5	SR 1	EL X	ET 4	ER 1	WL 1	WT 2	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	0	0	59	15	62	0	235	63	0	210	0	644	0	0	0	0	0	0	50	12	0
	7:15 AM	0	0	0	73	20	90	0	276	54	0	251	0	764	0	0	0	0	0	0	75	13	0
	7:30 AM	0	0	0	70	17	74	0	273	52	1	220	0	707	0	0	0	0	0	0	57	9	0
	7:45 AM	0	0	0	129	25	85	0	267	77	3	211	0	797	0	0	0	0	0	0	66	18	0
	8:00 AM	0	0	0	98	16	98	0	287	66	1	205	0	771	0	0	0	0	0	0	72	16	0
	8:15 AM	0	0	0	78	17	87	0	301	82	1	234	0	800	0	0	0	0	0	0	72	19	0
	8:30 AM	0	0	0	90	17	85	0	232	71	0	231	0	726	0	0	0	0	0	0	68	15	0
	8:45 AM	0	0	0	73	19	80	0	251	73	0	209	0	705	0	0	0	0	0	0	66	12	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	670	146	661	0	2,122	538	6	1,771	0	5,914	0	0	0	0	0	0	526	114	0
	APPROACH %	0%	0%	0%	45%	10%	45%	0%	80%	20%	0%	100%	0%										
	APP/DEPART	0	/	0	1,477	/	690	2,660	/	2,792	1,777	/	2,432	0									
	BEGIN PEAK HR		7:45 AM																				
	VOLUMES	0	0	0	395	75	355	0	1,087	296	5	881	0	3,094						0	278	68	0
	APPROACH %	0%	0%	0%	48%	9%	43%	0%	79%	21%	1%	99%	0%										
	PEAK HR FACTOR		0.000			0.863			0.903			0.943		0.967									
	APP/DEPART	0	/	0	825	/	376	1,383	/	1,482	886	/	1,236	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	74	40	138	0	269	152	4	189	0	866	0	0	0	0	0	0	115	21	0
	4:15 PM	0	0	0	68	42	121	0	238	161	4	200	0	834	0	0	0	0	0	0	100	28	0
	4:30 PM	0	0	0	82	43	153	0	242	154	5	193	0	872	0	0	0	0	0	0	121	24	0
	4:45 PM	0	0	0	93	40	143	0	279	125	3	251	0	934	0	0	0	0	0	0	107	16	0
	5:00 PM	0	0	0	83	68	149	0	290	159	3	216	0	968	0	0	0	0	0	0	108	26	0
	5:15 PM	0	0	0	77	51	153	0	256	153	6	216	0	912	0	0	0	0	0	0	122	29	0
	5:30 PM	0	0	0	91	61	170	0	229	164	2	224	0	941	0	0	0	0	0	0	141	31	0
	5:45 PM	0	0	0	94	43	184	0	300	166	6	222	0	1,015	0	0	0	0	0	0	139	34	0
	VOLUMES	0	0	0	662	388	1,211	0	2,103	1,234	33	1,711	0	7,342	0	0	0	0	0	0	953	209	0
	APPROACH %	0%	0%	0%	29%	17%	54%	0%	63%	37%	2%	98%	0%										
	APP/DEPART	0	/	0	2,261	/	1,655	3,337	/	2,765	1,744	/	2,922	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	0	0	0	345	223	656	0	1,075	642	17	878	0	3,836						0	510	120	0
	APPROACH %	0%	0%	0%	28%	18%	54%	0%	63%	37%	2%	98%	0%										
	PEAK HR FACTOR		0.000			0.950			0.921			0.981		0.945									
	APP/DEPART	0	/	0	1,224	/	882	1,717	/	1,420	895	/	1,534	0									

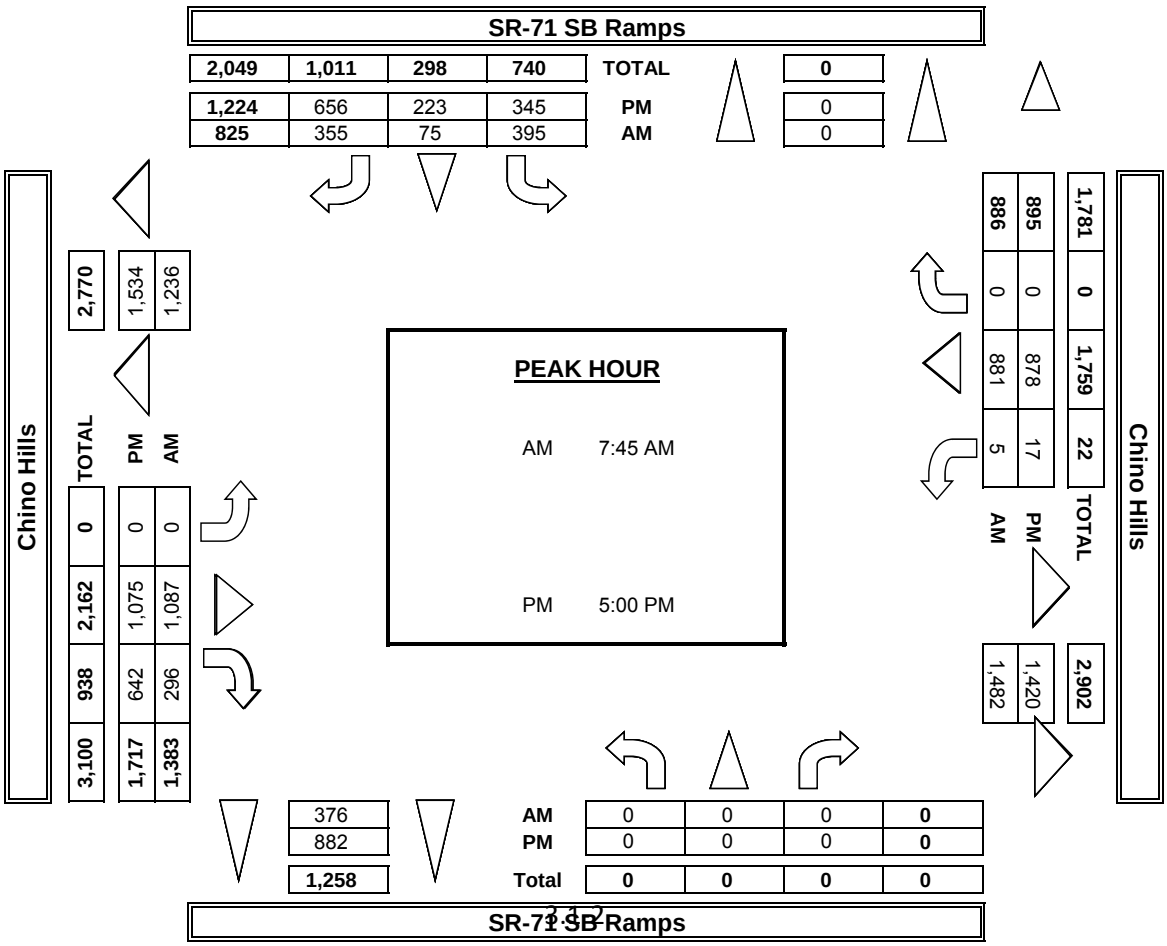


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	7:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	7:30 AM	0	0	1	1	2	0	0	1	1	2	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	4	4	0	0	0	3	3	0	0	0	1	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	3	7	10	0	0	2	5	7	0	0	1	2	3
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	2	4	6	0	0	2	4	6	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	1	1	0	2	0	0	0	0	0	0	1	1	0	2
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	1	2	3	0	0	0	0	0	0	0	1	2	3
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	3	1	4	0	0	2	0	2	0	0	1	1	2
	5:45 PM	0	0	0	3	3	0	0	0	2	2	0	0	0	1	1
	TOTAL	0	1	8	10	19	0	0	4	6	10	0	1	4	4	9

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	SR-71 SB Ramps	LOCATION #:	1
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND SR-71 SB Ramps			SOUTHBOUND SR-71 SB Ramps			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
LANES:	NL X	NT X	NR X	SL 1.5	ST 0.5	SR 1	EL X	ET 4	ER 1	WL 1	WT 2	WR X	TOTAL
7:00 AM	0	0	0	2	0	2	0	7	0	0	10	0	21
7:15 AM	0	0	0	3	0	5	0	2	2	0	12	0	24
7:30 AM	0	0	0	5	0	3	0	3	4	0	7	0	22
7:45 AM	0	0	0	6	0	3	0	4	3	0	13	0	29
8:00 AM	0	0	0	2	2	10	0	6	2	0	7	0	29
8:15 AM	0	0	0	8	1	4	0	8	0	0	5	0	26
8:30 AM	0	0	0	1	3	6	0	7	7	0	11	0	35
8:45 AM	0	0	0	5	3	5	0	8	4	0	10	0	35
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	32	9	38	0	45	22	0	75	0	221
APPROACH %	0%	0%	0%	41%	11%	48%	0%	67%	33%	0%	100%	0%	
APP/DEPART	0	/	0	79	/	31	67	/	77	75	/	113	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	0	0	16	9	25	0	29	13	0	33	0	125
APPROACH %	0%	0%	0%	32%	18%	50%	0%	69%	31%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.893			0.750			0.750		0.893
APP/DEPART	0	/	0	50	/	22	42	/	45	33	/	58	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	4	0	2	0	5	6	0	4	0	21
4:15 PM	0	0	0	7	1	2	0	13	8	0	3	0	34
4:30 PM	0	0	0	0	3	3	0	11	8	0	5	0	30
4:45 PM	0	0	0	4	1	3	0	4	7	0	3	0	22
5:00 PM	0	0	0	2	1	5	0	3	5	0	6	0	22
5:15 PM	0	0	0	2	0	5	0	3	5	0	0	0	15
5:30 PM	0	0	0	0	0	2	0	7	6	0	3	0	18
5:45 PM	0	0	0	3	0	4	0	5	1	2	3	0	18
VOLUMES	0	0	0	22	6	26	0	51	46	2	27	0	180
APPROACH %	0%	0%	0%	41%	11%	48%	0%	53%	47%	7%	93%	0%	
APP/DEPART	0	/	0	54	/	54	97	/	73	29	/	53	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	0	0	0	13	6	13	0	31	28	0	17	0	108
APPROACH %	0%	0%	0%	41%	19%	41%	0%	53%	47%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.800			0.702			0.708		0.794
APP/DEPART	0	/	0	32	/	34	59	/	44	17	/	30	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	1	0	0
0	4	0	0
0	2	0	0
0	3	0	0
0	8	0	0
0	3	0	0
0	4	0	0
0	4	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	29	0	0
0	19	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	2	0	0
0	2	0	0
0	2	0	0
0	3	0	0
0	4	0	0
0	3	0	0
0	1	0	0
0	3	0	0
0	20	0	0
0	11	0	0

SR-71 SB Ramps

NORTH SIDE

Chino Hills WEST SIDE EAST SIDE **Chino Hills**

SOUTH SIDE

SR-71 SB Ramps

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	SR-71 SB Ramps	LOCATION #:	1
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

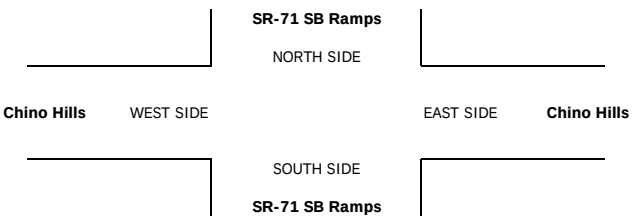
		NORTHBOUND (SR-71 SB Ramps)			SOUTHBOUND (SR-71 SB Ramps)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
	LANES:	NL X	NT X	NR X	SL 1.5	ST 0.5	SR 1	EL X	ET 4	ER 1	WL 1	WT 2	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	1	0	0	0	0	5	0	6
	7:15 AM	0	0	0	1	0	0	0	0	0	0	1	0	2
	7:30 AM	0	0	0	1	1	1	0	0	0	0	1	0	4
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	2
	8:15 AM	0	0	0	2	0	3	0	1	0	0	0	0	6
	8:30 AM	0	0	0	2	1	1	0	0	0	0	1	0	5
	8:45 AM	0	0	0	1	0	0	0	1	0	0	1	0	3
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	8	3	6	0	2	0	0	9	0	28
	APPROACH %	0%	0%	0%	47%	18%	35%	0%	100%	0%	0%	100%	0%	
	APP/DEPART	0	/	0	17	/	3	2	/	10	9	/	15	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	0	0	6	2	4	0	2	0	0	2	0	16
	APPROACH %	0%	0%	0%	50%	17%	33%	0%	100%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.600			0.500			0.500		0.667
	APP/DEPART	0	/	0	12	/	2	2	/	8	2	/	6	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	2	0	0	0	3	0	0	1	0	6
	4:15 PM	0	0	0	0	0	1	0	1	0	0	2	0	4
	4:30 PM	0	0	0	2	0	1	0	0	2	0	3	0	8
	4:45 PM	0	0	0	0	0	0	0	1	1	0	1	0	3
	5:00 PM	0	0	0	1	0	0	0	1	0	0	1	0	3
	5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
	5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
	5:45 PM	0	0	0	0	0	0	0	1	1	0	0	0	2
	VOLUMES	0	0	0	5	0	2	0	7	4	0	11	0	29
	APPROACH %	0%	0%	0%	71%	0%	29%	0%	64%	36%	0%	100%	0%	
	APP/DEPART	0	/	0	7	/	4	11	/	12	11	/	13	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	0	0	4	0	2	0	5	3	0	7	0	21
	APPROACH %	0%	0%	0%	67%	0%	33%	0%	63%	38%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.500			0.667			0.583		0.656
	APP/DEPART	0	/	0	6	/	3	8	/	9	7	/	9	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	3	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	4	0	0
0	3	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	2	0	0
0	2	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	SR-71 SB Ramps	LOCATION #:	1
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND SR-71 SB Ramps			SOUTHBOUND SR-71 SB Ramps			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
	LANES:	NL X	NT X	NR X	SL 1.5	ST 0.5	SR 1	EL X	ET 4	ER 1	WL 1	WT 2	WR X	TOTAL
AM	7:00 AM	0	0	0	4	0	2	0	0	0	0	0	0	6
	7:15 AM	0	0	0	4	0	1	0	0	0	0	1	0	6
	7:30 AM	0	0	0	3	0	2	0	1	0	0	3	0	9
	7:45 AM	0	0	0	4	0	1	0	2	0	0	0	0	7
	8:00 AM	0	0	0	6	0	1	0	3	0	0	0	0	10
	8:15 AM	0	0	0	6	0	2	0	0	1	0	0	0	9
	8:30 AM	0	0	0	2	0	1	0	3	0	0	2	0	8
	8:45 AM	0	0	0	3	0	2	0	0	0	0	0	0	5
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	32	0	12	0	9	1	0	6	0	60
	APPROACH %	0%	0%	0%	73%	0%	27%	0%	90%	10%	0%	100%	0%	
	APP/DEPART	0	/	0	44	/	1	10	/	41	6	/	18	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	0	0	0	19	0	6	0	6	1	0	3	0	35
	APPROACH %	0%	0%	0%	76%	0%	24%	0%	86%	14%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.781			0.583			0.250		0.875
	APP/DEPART	0	/	0	25	/	1	7	/	25	3	/	9	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	2
	4:15 PM	0	0	0	4	0	0	0	1	1	0	0	0	6
	4:30 PM	0	0	0	2	0	0	0	1	0	0	1	0	4
	4:45 PM	0	0	0	1	0	0	0	1	0	0	1	0	3
	5:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
	5:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
	5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
	5:45 PM	0	0	0	1	0	0	0	1	0	0	0	0	2
	VOLUMES	0	0	0	14	0	1	0	4	1	0	2	0	22
	APPROACH %	0%	0%	0%	93%	0%	7%	0%	80%	20%	0%	100%	0%	
	APP/DEPART	0	/	0	15	/	1	5	/	18	2	/	3	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	0	0	8	0	1	0	3	1	0	2	0	15
	APPROACH %	0%	0%	0%	89%	0%	11%	0%	75%	25%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.563			0.500			0.500		0.625
	APP/DEPART	0	/	0	9	/	1	4	/	11	2	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	1	0	0
0	0	0	0
0	2	0	0
0	0	0	0
0	1	0	0
0	1	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	6	0	0
0	4	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
0	0	0	0
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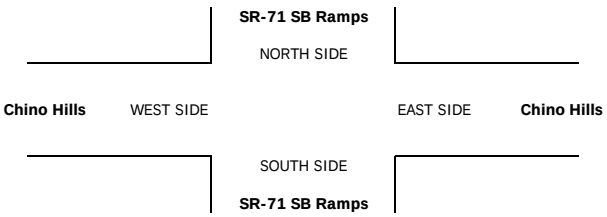
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: SR-71 NB Ramps
EAST & WEST: Chino Hills

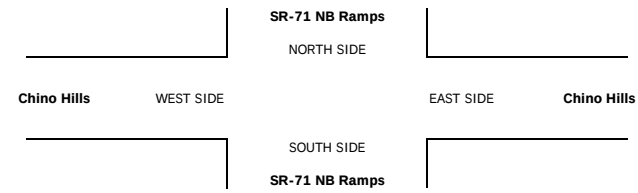
PROJECT #: SC0952
LOCATION #: 2
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — N / W / E / S

Add U-Turns to Left Turns

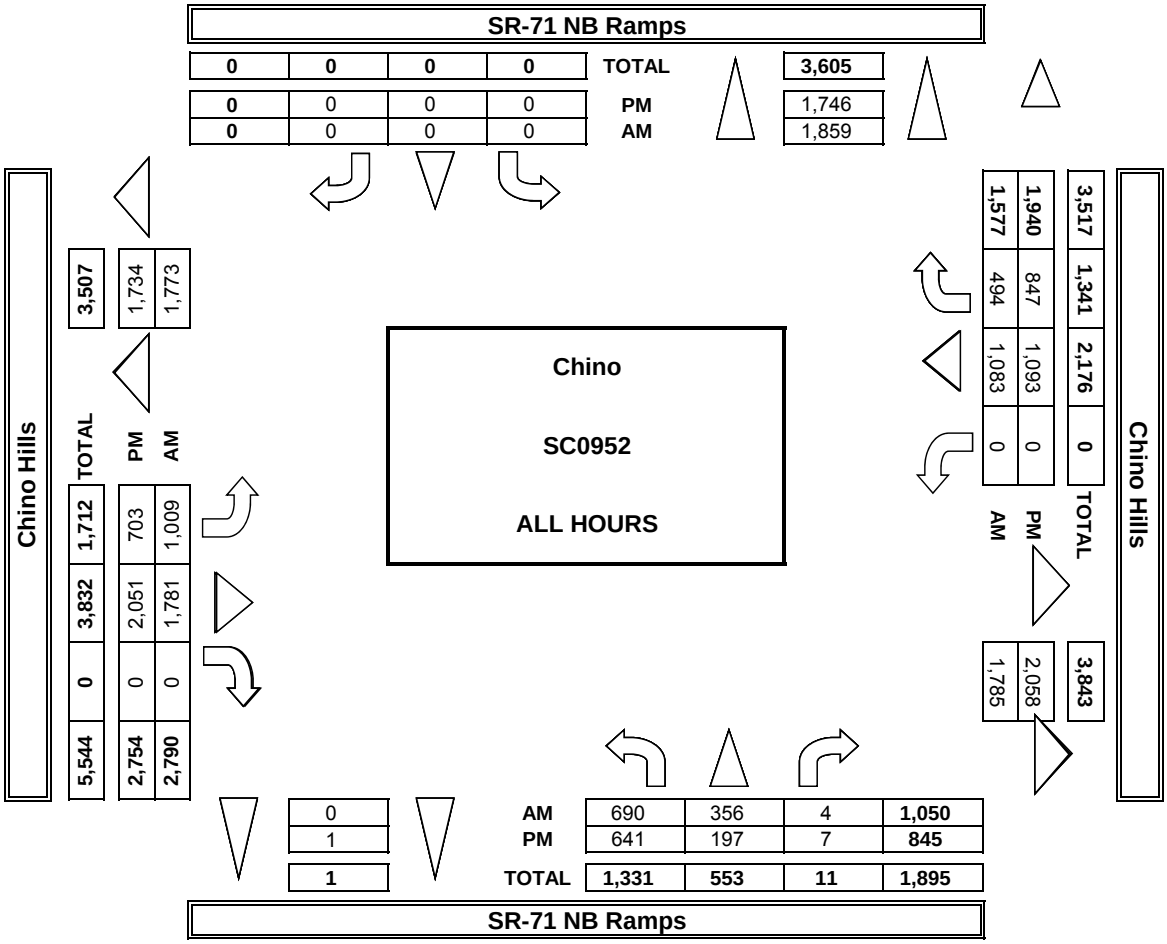
		NORTHBOUND SR-71 NB Ramps			SOUTHBOUND SR-71 NB Ramps			EASTBOUND Chino Hills			WESTBOUND Chino Hills				U-TURNS					RTOR			
	LANES:	NL 1.5	NT 1	NR 0.5	SL X	ST X	SR X	EL 2	ET 2	ER X	WL X	WT 2	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	84	57	1	0	0	0	137	159	0	0	125	70	633	0	0	0	0	0	0	0	0	0
	7:15 AM	92	47	1	0	0	0	146	205	0	0	157	74	722	0	0	0	0	0	1	0	0	1
	7:30 AM	106	48	0	0	0	0	144	196	0	0	115	52	661	0	0	0	0	0	0	0	0	0
	7:45 AM	90	58	0	0	0	0	114	284	0	0	122	74	742	0	0	0	0	0	0	0	0	0
	8:00 AM	61	37	2	0	0	0	111	272	0	0	146	56	685	0	0	0	0	0	2	0	0	0
	8:15 AM	102	36	0	0	0	0	120	259	0	0	134	56	707	0	0	0	0	0	0	0	0	3
	8:30 AM	80	37	0	0	0	0	121	200	0	0	150	51	639	0	0	0	0	0	0	0	0	0
	8:45 AM	75	36	0	0	0	0	116	206	0	0	134	61	628	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	690	356	4	0	0	0	1,009	1,781	0	0	1,083	494	5,417	0	0	0	0	0	3	0	0	4
	APPROACH %	66%	34%	0%	0%	0%	0%	36%	64%	0%	0%	69%	31%										
	APP/DEPART	1,050	/	1,859	0	/	0	2,790	/	1,785	1,577	/	1,773	0									
	BEGIN PEAK HR		7:15 AM																				
	VOLUMES	349	190	3	0	0	0	515	957	0	0	540	256	2,810						3	0	0	1
	APPROACH %	64%	35%	1%	0%	0%	0%	35%	65%	0%	0%	68%	32%										
	PEAK HR FACTOR		0.880			0.000			0.925			0.861		0.947									
	APP/DEPART	542	/	961	0	/	0	1,472	/	960	796	/	889	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	53	19	1	0	0	0	82	259	0	0	137	109	660	0	0	0	0	0	1	0	0	2
	4:15 PM	82	31	0	0	0	0	83	221	0	0	120	82	619	0	0	0	0	0	0	0	0	1
	4:30 PM	71	27	2	0	0	0	94	229	0	0	123	135	681	0	0	1	0	1	2	0	0	0
	4:45 PM	93	26	2	0	0	0	85	283	0	0	160	86	735	0	0	0	0	0	1	0	0	1
	5:00 PM	70	31	1	0	0	0	105	270	0	0	148	143	768	0	0	0	0	0	1	0	0	2
	5:15 PM	93	16	0	0	0	0	92	241	0	0	131	109	682	1	0	0	0	1	0	0	0	0
	5:30 PM	99	24	0	0	0	0	84	236	0	0	127	107	677	0	0	0	0	0	0	0	0	2
	5:45 PM	80	23	1	0	0	0	78	312	0	0	147	76	717	0	0	0	0	0	1	0	0	1
	VOLUMES	641	197	7	0	0	0	703	2,051	0	0	1,093	847	5,539	1	0	1	0	2	6	0	0	9
	APPROACH %	76%	23%	1%	0%	0%	0%	26%	74%	0%	0%	56%	44%										
	APP/DEPART	845	/	1,746	0	/	1	2,754	/	2,058	1,940	/	1,734	0									
	BEGIN PEAK HR		4:30 PM																				
	VOLUMES	327	100	5	0	0	0	376	1,023	0	0	562	473	2,866						4	0	0	3
	APPROACH %	76%	23%	1%	0%	0%	0%	27%	73%	0%	0%	54%	46%										
	PEAK HR FACTOR		0.893			0.000			0.933			0.889		0.933									
	APP/DEPART	432	/	948	0	/	1	1,399	/	1,028	1,035	/	889	0									

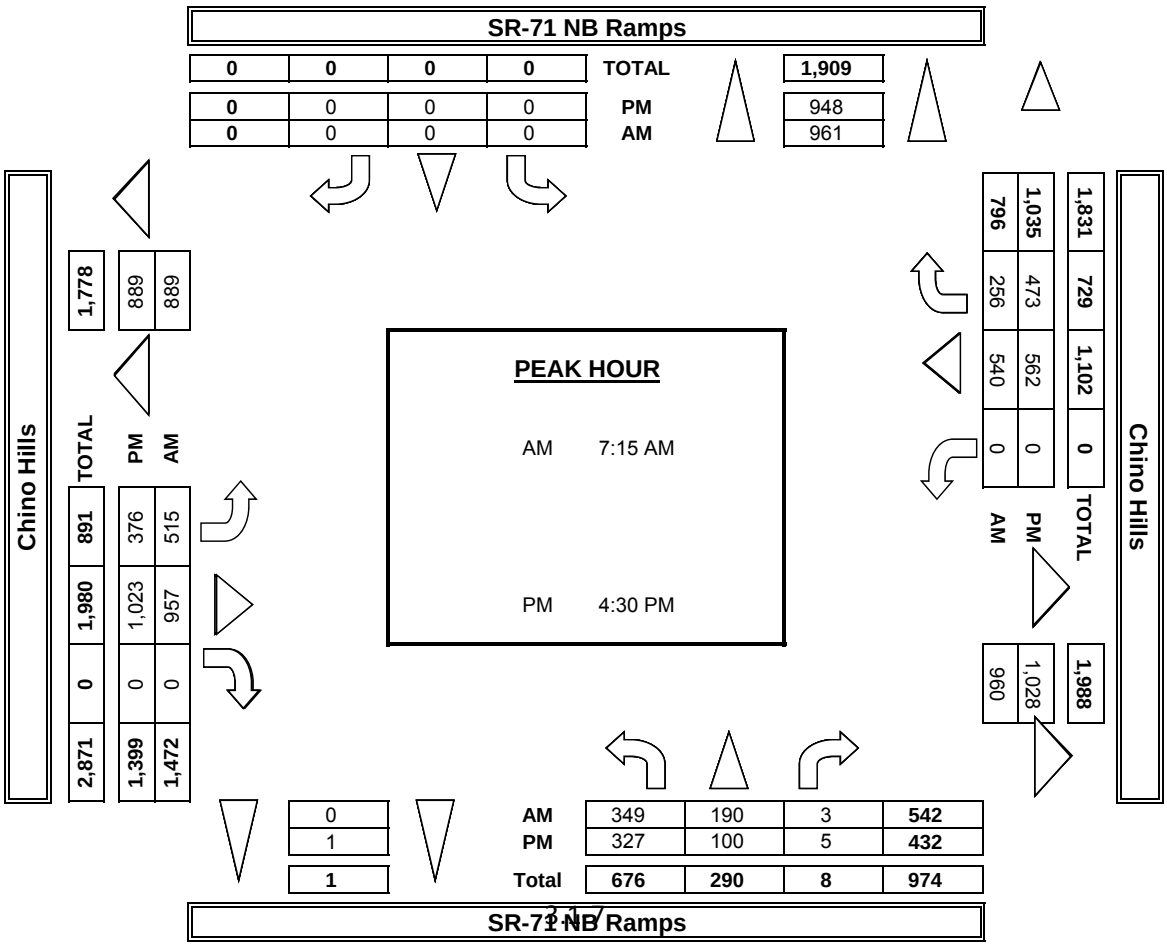


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	7:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	7:30 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	4	4	0	0	0	3	3	0	0	0	1	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	2	7	9	0	0	1	4	5	0	0	1	3	4
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	2	5	7	0	0	2	5	7	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	5:15 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	5:30 PM	0	0	1	1	2	0	0	1	0	1	0	0	0	1	1
	5:45 PM	0	0	0	2	2	0	0	0	1	1	0	0	0	1	1
	TOTAL	0	0	4	11	15	0	0	3	8	11	0	0	1	3	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	SR-71 NB Ramps	LOCATION #:	2
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 2:	NOTES:	AM / PM / MD / OTHER / OTHER
2-AXLE WORK VEHICLES/ TRUCKS		▲ N ◄ W E ► S ▼

	NORTHBOUND SR-71 NB Ramps			SOUTHBOUND SR-71 NB Ramps			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
LANES:	NL 1.5	NT 1	NR 0.5	SL X	ST X	SR X	EL 2	ET 2	ER X	WL X	WT 2	WR 1	TOTAL
7:00 AM	1	0	0	0	0	0	3	6	0	0	9	9	28
7:15 AM	4	2	0	0	0	0	0	5	0	0	8	4	23
7:30 AM	3	0	0	0	0	0	3	5	0	0	4	2	17
7:45 AM	4	2	0	0	0	0	1	9	0	0	9	4	29
8:00 AM	2	2	0	0	0	0	4	7	0	0	5	2	22
8:15 AM	3	2	0	0	0	0	3	9	0	0	2	4	23
8:30 AM	3	0	0	0	0	0	2	6	0	0	8	4	23
8:45 AM	4	1	0	0	0	0	3	10	0	0	6	4	28
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	24	9	0	0	0	0	19	57	0	0	51	33	193
APPROACH %	73%	27%	0%	0%	0%	0%	25%	75%	0%	0%	61%	39%	
APP/DEPART	33	/	61	0	/	0	76	/	57	84	/	75	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	12	4	0	0	0	0	7	25	0	0	30	19	97
APPROACH %	75%	25%	0%	0%	0%	0%	22%	78%	0%	0%	61%	39%	
PEAK HR FACTOR		0.667			0.000			0.667			0.681		0.836
APP/DEPART	16	/	30	0	/	0	32	/	25	49	/	42	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	0	0	0	0	0	9	0	0	3	3	16
4:15 PM	1	1	0	0	0	0	2	18	0	0	2	1	25
4:30 PM	4	0	0	0	0	0	2	9	0	0	1	2	18
4:45 PM	1	1	0	0	0	0	1	7	0	0	2	0	12
5:00 PM	3	3	0	0	0	0	1	4	0	0	3	1	15
5:15 PM	0	0	0	0	0	0	2	3	0	0	0	3	8
5:30 PM	3	0	0	0	0	0	3	4	0	0	0	1	11
5:45 PM	2	0	0	0	0	0	0	8	0	0	3	2	15
VOLUMES	15	5	0	0	0	0	11	62	0	0	14	13	120
APPROACH %	75%	25%	0%	0%	0%	0%	15%	85%	0%	0%	52%	48%	
APP/DEPART	20	/	29	0	/	0	73	/	62	27	/	29	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	7	2	0	0	0	0	5	43	0	0	8	6	71
APPROACH %	78%	22%	0%	0%	0%	0%	10%	90%	0%	0%	57%	43%	
PEAK HR FACTOR		0.563			0.000			0.600			0.583		0.710
APP/DEPART	9	/	13	0	/	0	48	/	43	14	/	15	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
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0	0	0	0	0
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0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
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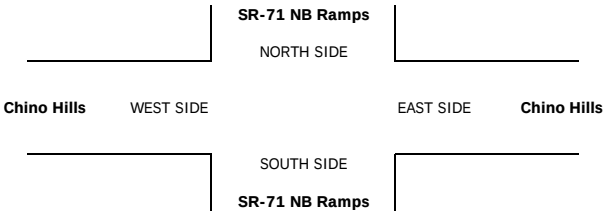
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	SR-71 NB Ramps	LOCATION #:	2
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

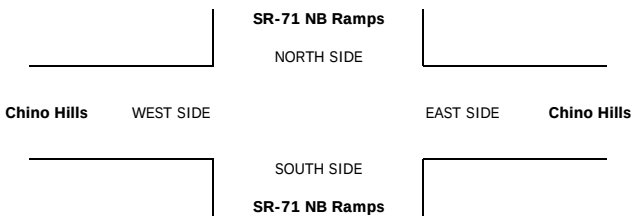
	NORTHBOUND (SR-71 NB Ramps)			SOUTHBOUND (SR-71 NB Ramps)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
LANES:	NL 1.5	NT 1	NR 0.5	SL X	ST X	SR X	EL 2	ET 2	ER X	WL X	WT 2	WR 1	TOTAL
7:00 AM	3	0	0	0	0	0	0	0	0	0	2	0	5
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	2
7:30 AM	1	0	0	0	0	0	0	1	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	2	2	0	0	0	1	5
8:00 AM	0	0	0	0	0	0	1	0	0	0	0	1	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
8:30 AM	1	0	0	0	0	0	2	0	0	0	0	2	5
8:45 AM	0	1	0	0	0	0	1	1	0	0	1	0	4
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	5	1	0	0	0	0	6	4	0	0	4	6	26
APPROACH %	83%	17%	0%	0%	0%	0%	60%	40%	0%	0%	40%	60%	
APP/DEPART	6	/	13	0	/	0	10	/	4	10	/	9	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	4	0	0	0	0	0	2	3	0	0	3	2	14
APPROACH %	100%	0%	0%	0%	0%	0%	40%	60%	0%	0%	60%	40%	
PEAK HR FACTOR		0.333			0.000			0.313			0.625		0.700
APP/DEPART	4	/	4	0	/	0	5	/	3	5	/	7	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	1	0	0	0	0	3	2	0	0	0	0	7
4:15 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
5:15 PM	0	0	0	0	0	0	1	0	0	0	1	0	2
5:30 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
VOLUMES	1	1	0	0	0	0	4	8	0	0	10	0	24
APPROACH %	50%	50%	0%	0%	0%	0%	33%	67%	0%	0%	100%	0%	
APP/DEPART	2	/	5	0	/	0	12	/	8	10	/	11	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	1	0	0	0	0	3	3	0	0	6	0	14
APPROACH %	50%	50%	0%	0%	0%	0%	50%	50%	0%	0%	100%	0%	
PEAK HR FACTOR		0.250			0.000			0.300			0.500		0.500
APP/DEPART	2	/	4	0	/	0	6	/	3	6	/	7	0

U-TURNS

AM NB	AM SB	AM EB	AM WB	AM TTL	PM NB	PM SB	PM EB	PM WB	PM TTL
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

RTOR

AM NRR	AM SRR	AM ERR	AM WRR	PM NRR	PM SRR	PM ERR	PM WRR
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	SR-71 NB Ramps	LOCATION #:	2
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND SR-71 NB Ramps			SOUTHBOUND SR-71 NB Ramps			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
LANES:	NL 1.5	NT 1	NR 0.5	SL X	ST X	SR X	EL 2	ET 2	ER X	WL X	WT 2	WR 1	TOTAL
7:00 AM	0	0	0	0	0	0	0	3	0	0	0	3	6
7:15 AM	0	1	0	0	0	0	0	4	0	0	1	2	8
7:30 AM	0	0	0	0	0	0	0	4	0	0	2	3	9
7:45 AM	0	0	0	0	0	0	1	5	0	0	0	4	10
8:00 AM	0	0	0	0	0	0	2	7	0	0	0	3	12
8:15 AM	0	0	0	0	0	0	1	5	0	0	0	3	9
8:30 AM	1	0	0	0	0	0	1	4	0	0	1	3	10
8:45 AM	0	0	0	0	0	0	0	3	0	0	0	4	7
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	1	0	0	0	0	5	35	0	0	4	25	71
APPROACH %	50%	50%	0%	0%	0%	0%	13%	88%	0%	0%	14%	86%	
APP/DEPART	2	/	31	0	/	0	40	/	35	29	/	5	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	1	0	0	0	0	0	5	21	0	0	1	13	41
APPROACH %	100%	0%	0%	0%	0%	0%	19%	81%	0%	0%	7%	93%	
PEAK HR FACTOR		0.250			0.000			0.722			0.875		0.854
APP/DEPART	1	/	18	0	/	0	26	/	21	14	/	2	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	3	4
4:15 PM	0	0	0	0	0	0	1	4	0	0	0	4	9
4:30 PM	1	0	0	0	0	0	1	2	0	0	0	2	6
4:45 PM	1	0	0	0	0	0	1	1	0	0	0	5	8
5:00 PM	0	0	0	0	0	0	0	2	0	0	0	6	8
5:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	3	4
5:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
VOLUMES	2	0	0	0	0	0	3	15	0	0	0	23	43
APPROACH %	100%	0%	0%	0%	0%	0%	17%	83%	0%	0%	0%	100%	
APP/DEPART	2	/	26	0	/	0	18	/	15	23	/	2	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	2	0	0	0	0	0	3	9	0	0	0	17	31
APPROACH %	100%	0%	0%	0%	0%	0%	25%	75%	0%	0%	0%	100%	
PEAK HR FACTOR		0.500			0.000			0.600			0.708		0.861
APP/DEPART	2	/	20	0	/	0	12	/	9	17	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
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0	0	0	0	0
0	0	0	0	0
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0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

SR-71 NB Ramps

NORTH SIDE

Chino Hills WEST SIDE EAST SIDE **Chino Hills**

SOUTH SIDE

SR-71 NB Ramps

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: Ramona
EAST & WEST: Chino Hills

PROJECT #: SC0952
LOCATION #: 3
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — N / W / E / S

Add U-Turns to Left Turns

		NORTHBOUND (Ramona)			SOUTHBOUND (Ramona)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 2.5	ER 0.5	WL 1	WT 2	WR 1	TOTAL
AM	7:00 AM	13	67	25	16	35	49	51	107	1	8	133	14	519
	7:15 AM	3	85	27	22	25	52	62	144	1	10	175	27	633
	7:30 AM	4	61	25	18	37	44	59	136	0	12	121	14	531
	7:45 AM	11	93	38	13	38	51	80	203	0	20	130	21	698
	8:00 AM	4	96	41	15	38	47	66	208	1	17	153	19	705
	8:15 AM	9	100	34	19	39	55	85	172	2	13	128	17	673
	8:30 AM	1	81	25	21	42	51	76	125	0	13	145	27	607
	8:45 AM	4	91	31	24	37	58	78	126	0	17	129	28	623
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	49	674	246	148	291	407	557	1,221	5	110	1,114	167	4,989
	APPROACH %	5%	70%	25%	17%	34%	48%	31%	68%	0%	8%	80%	12%	
	APP/DEPART	969	/	1,398	846	/	406	1,783	/	1,615	1,391	/	1,570	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	25	370	138	68	157	204	307	708	3	63	556	84	2,683
	APPROACH %	5%	69%	26%	16%	37%	48%	30%	70%	0%	9%	79%	12%	
	PEAK HR FACTOR		0.932			0.941			0.899			0.930		0.951
	APP/DEPART	533	/	761	429	/	223	1,018	/	914	703	/	785	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	10	55	40	42	96	82	71	186	0	29	153	42	806
	4:15 PM	9	73	29	34	95	61	48	173	0	38	133	37	730
	4:30 PM	4	77	39	37	106	95	56	176	0	34	158	38	820
	4:45 PM	5	72	38	39	96	75	70	212	0	25	167	25	824
	5:00 PM	6	55	28	39	120	113	50	219	1	44	171	32	878
	5:15 PM	6	72	27	31	109	93	49	193	1	30	141	25	777
	5:30 PM	6	76	38	47	101	99	56	178	2	16	128	30	777
	5:45 PM	12	86	39	38	72	73	78	228	4	37	137	31	835
	VOLUMES	58	566	278	307	795	691	478	1,565	8	253	1,188	260	6,447
	APPROACH %	6%	63%	31%	17%	44%	39%	23%	76%	0%	15%	70%	15%	
	APP/DEPART	902	/	1,304	1,793	/	1,049	2,051	/	2,157	1,701	/	1,937	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	21	276	132	146	431	376	225	800	2	133	637	120	3,299
	APPROACH %	5%	64%	31%	15%	45%	39%	22%	78%	0%	15%	72%	13%	
	PEAK HR FACTOR		0.894			0.876			0.910			0.901		0.939
	APP/DEPART	429	/	621	953	/	563	1,027	/	1,081	890	/	1,034	0

U-TURNS

	NB X	SB X	EB X	WB X	TTL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
AM VOLUMES	0	0	0	0	0
03:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	0	0	0	2	2
4:15 PM	0	0	0	1	1
4:30 PM	0	0	0	0	0
5:00 PM	0	0	0	2	2
5:15 PM	0	0	0	1	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	1	1
PM VOLUMES	0	0	0	7	7

RTOR

	NRR 0	SRR 0	ERR 0	WRR 0
7:00 AM	12	16	0	2
7:15 AM	13	13	0	5
7:30 AM	11	13	0	8
7:45 AM	16	19	0	3
8:00 AM	17	24	1	4
8:15 AM	21	28	0	3
8:30 AM	11	20	0	6
8:45 AM	13	25	0	6
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
AM VOLUMES	114	158	1	37
AM PEAK HR VOLUMES	65	91	1	16
03:00 PM	0	0	0	0
3:15 PM	0	0	0	0
3:30 PM	0	0	0	0
3:45 PM	0	0	0	0
4:00 PM	29	31	0	10
4:15 PM	8	23	0	14
4:30 PM	14	25	0	12
4:45 PM	22	24	0	9
5:00 PM	13	28	0	12
5:15 PM	3	26	0	9
5:30 PM	12	21	0	10
5:45 PM	22	23	3	9
PM VOLUMES	123	201	3	85
PM PEAK HR VOLUMES	52	103	0	42

Ramona

NORTH SIDE

Chino Hills — WEST SIDE — EAST SIDE — Chino Hills

SOUTH SIDE

Ramona

ALL PED AND BIKE

	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
7:00 AM	1	0	0	0	1
7:15 AM	0	0	0	0	0
7:30 AM	1	1	0	1	3
7:45 AM	0	0	0	0	0
8:00 AM	2	3	3	2	10
8:15 AM	1	0	0	1	2
8:30 AM	0	3	1	0	4
8:45 AM	1	0	1	0	2
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
AM TOTAL	6	7	5	4	22
3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	1	4	5	1	11
4:15 PM	1	4	3	1	9
4:30 PM	1	0	0	0	1
4:45 PM	0	4	4	0	8
5:00 PM	2	0	0	2	4
5:15 PM	1	0	0	0	1
5:30 PM	0	1	0	0	1
5:45 PM	0	1	1	1	3
PM TOTAL	6	14	13	5	38

PEDESTRIAN CROSSINGS

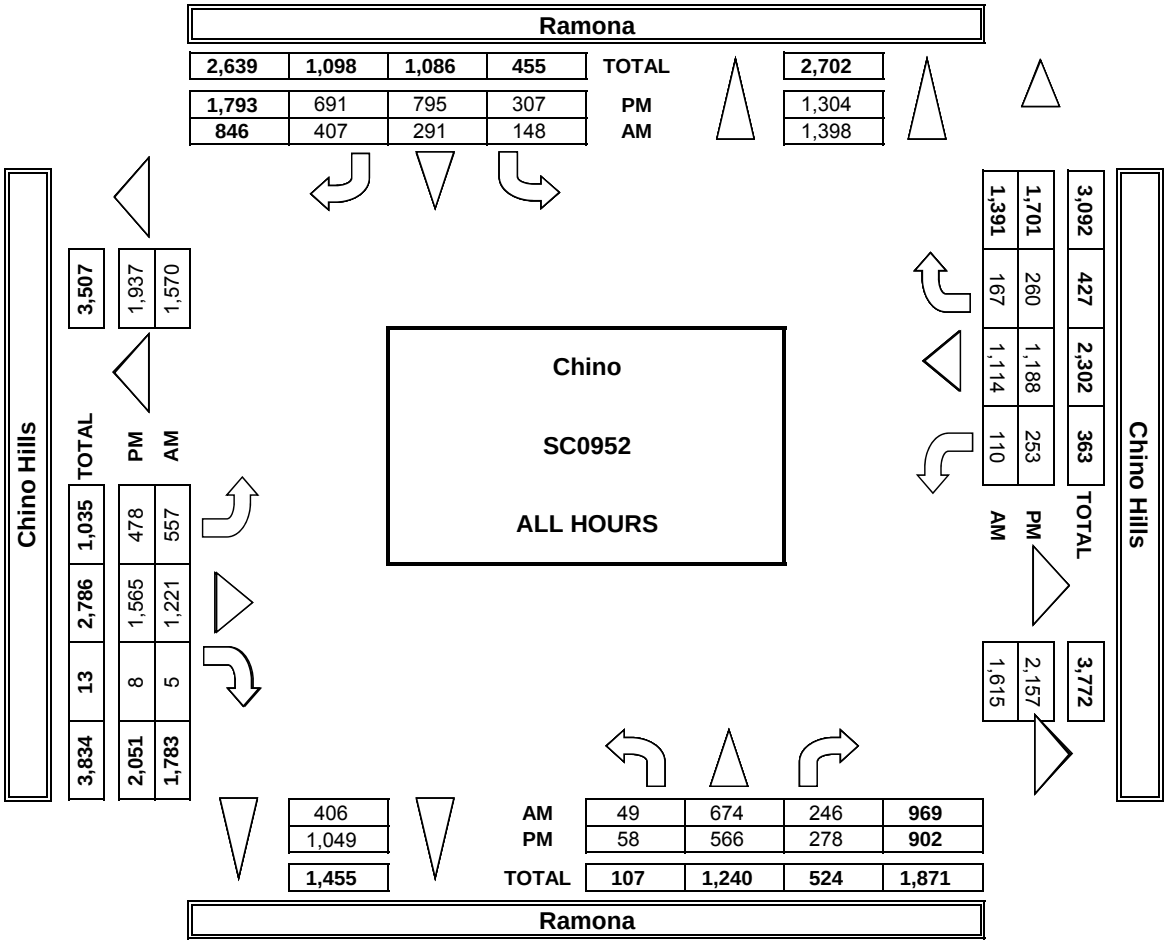
	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	1	0	0	1	2
7:45 AM	0	0	0	0	0
8:00 AM	2	1	1	2	6
8:15 AM	0	0	0	0	0
8:30 AM	0	3	1	0	4
8:45 AM	0	0	0	0	0
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
AM TOTAL	3	4	2	3	12
3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	1	4	5	1	11
4:15 PM	0	4	3	0	7
4:30 PM	1	0	0	0	1
4:45 PM	0	3	3	0	6
5:00 PM	1	0	0	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	1	1
PM TOTAL	3	11	11	2	27

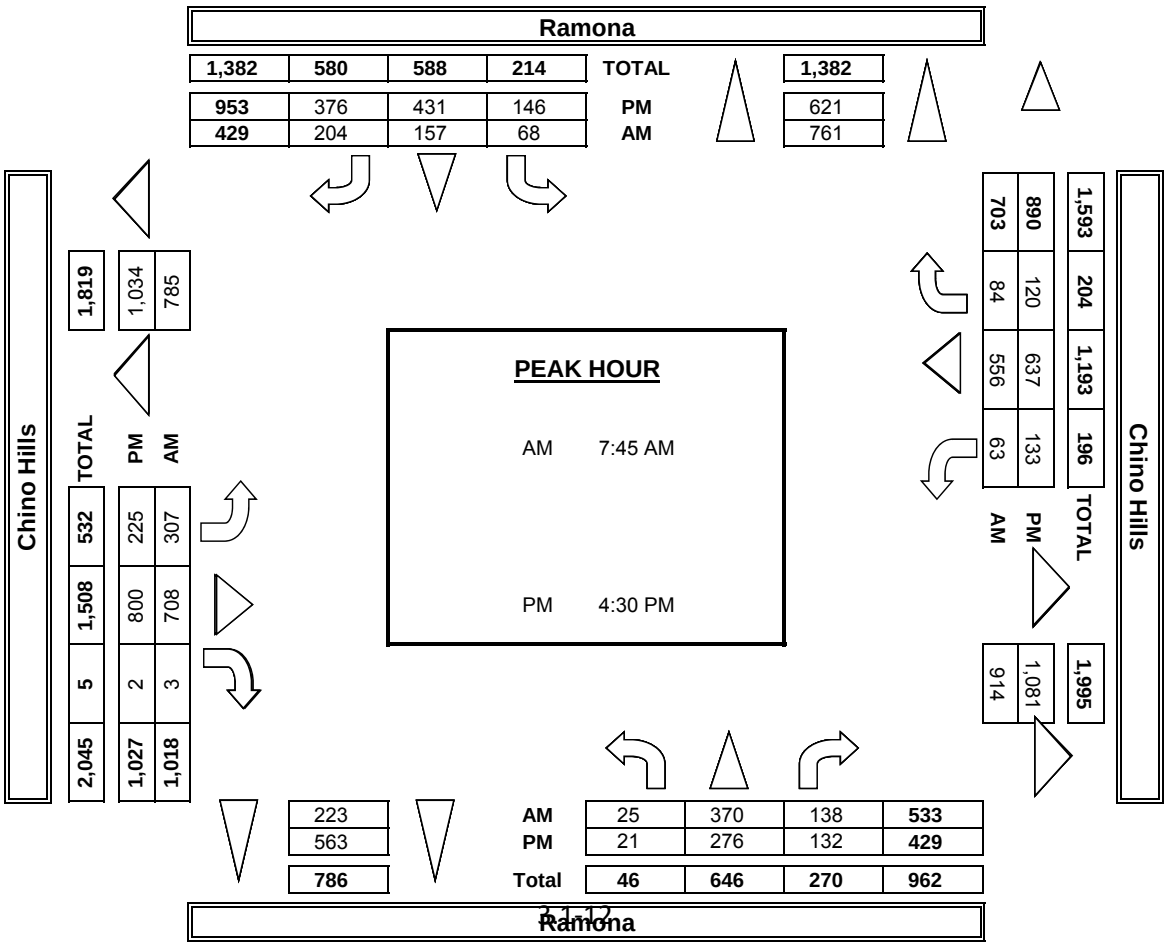
BICYCLE CROSSINGS

	ES	WS	SS	NS	TOTAL
7:00 AM	1	0	0	0	1
7:15 AM	0	0	0	0	0
7:30 AM	0	1	0	0	1
7:45 AM	0	0	0	0	0
8:00 AM	0	2	2	0	4
8:15 AM	1	0	0	1	2
8:30 AM	0	0	0	0	0
8:45 AM	1	0	1	0	2
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
AM TOTAL	3	3	3	1	10
3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	0	0	0	0	0
4:15 PM	1	0	0	1	2
4:30 PM	0	0	0	0	0
4:45 PM	0	1	1	0	2
5:00 PM	1	0	0	2	3
5:15 PM	1	0	0	0	1
5:30 PM	0	1	0	0	1
5:45 PM	0	1	1	0	2
PM TOTAL	3	3	2	3	11

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Ramona	LOCATION #:	3
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

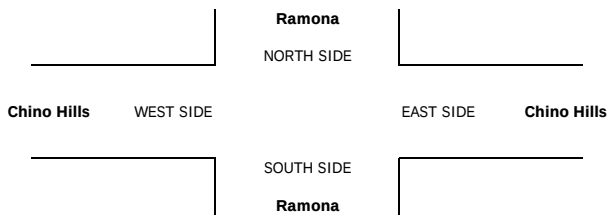
	NORTHBOUND (Ramona)			SOUTHBOUND (Ramona)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 2.5	ER 0.5	WL 1	WT 2	WR 1	TOTAL
7:00 AM	0	4	1	2	5	5	2	4	0	0	13	0	36
7:15 AM	0	3	0	1	1	5	2	3	0	1	7	2	25
7:30 AM	0	2	2	0	9	3	2	3	0	0	3	1	25
7:45 AM	0	2	1	1	0	7	5	4	0	0	6	1	27
8:00 AM	0	5	2	3	5	5	5	2	0	1	2	3	33
8:15 AM	0	3	1	2	2	3	3	9	1	1	3	0	28
8:30 AM	0	4	3	2	5	3	1	5	0	0	9	1	33
8:45 AM	0	3	0	1	5	4	7	3	0	1	6	0	30
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	26	10	12	32	35	27	33	1	4	49	8	237
APPROACH %	0%	72%	28%	15%	41%	44%	44%	54%	2%	7%	80%	13%	
APP/DEPART	36	/	61	79	/	37	61	/	55	61	/	84	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	15	6	8	17	15	16	19	1	3	20	4	124
APPROACH %	0%	71%	29%	20%	43%	38%	44%	53%	3%	11%	74%	15%	
PEAK HR FACTOR		0.750			0.769			0.692			0.675		0.939
APP/DEPART	21	/	35	40	/	21	36	/	33	27	/	35	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	2	4	2	7	0	1	2	1	19
4:15 PM	0	0	0	0	3	0	8	13	0	1	3	1	29
4:30 PM	0	1	0	0	1	1	2	7	0	0	2	1	15
4:45 PM	0	2	1	1	2	1	2	5	0	2	1	0	17
5:00 PM	0	1	2	0	0	1	1	3	0	2	3	1	14
5:15 PM	0	3	0	0	1	0	0	3	0	1	1	1	10
5:30 PM	1	3	0	2	1	0	2	2	0	1	0	0	12
5:45 PM	0	1	0	0	1	2	2	6	0	0	3	0	15
VOLUMES	1	11	3	3	11	9	19	46	0	8	15	5	131
APPROACH %	7%	73%	20%	13%	48%	39%	29%	71%	0%	29%	54%	18%	
APP/DEPART	15	/	35	23	/	19	65	/	52	28	/	25	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	3	1	1	8	6	14	32	0	4	8	3	80
APPROACH %	0%	75%	25%	7%	53%	40%	30%	70%	0%	27%	53%	20%	
PEAK HR FACTOR		0.333			0.625			0.548			0.750		0.690
APP/DEPART	4	/	20	15	/	12	46	/	34	15	/	14	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
1	1	0	0
0	3	0	0
1	1	0	1
0	2	0	0
0	2	0	1
1	3	0	0
0	2	0	0
0	3	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
3	17	0	2
1	10	0	1
0	0	0	0
0	1	0	1
0	0	0	0
0	0	0	0
0	1	0	1
1	1	0	0
1	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
2	4	0	2
1	3	0	2



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Ramona	LOCATION #:	3
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Ramona)			SOUTHBOUND (Ramona)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 2.5	ER 0.5	WL 1	WT 2	WR 1	TOTAL
AM	7:00 AM	0	1	1	0	0	0	0	0	0	0	2	1	5
	7:15 AM	0	0	0	0	0	1	1	0	0	0	1	0	3
	7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
	7:45 AM	0	0	0	0	1	0	1	0	0	0	1	0	3
	8:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
	8:15 AM	0	1	0	0	1	0	0	0	0	0	1	0	3
	8:30 AM	0	3	0	0	0	0	0	0	0	0	2	2	7
	8:45 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	5	2	0	2	1	2	2	0	0	8	3	25
	APPROACH %	0%	71%	29%	0%	67%	33%	50%	50%	0%	0%	73%	27%	
	APP/DEPART	7	/	10	3	/	2	4	/	4	11	/	9	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	0	4	1	0	2	0	1	0	0	0	4	2	14
	APPROACH %	0%	80%	20%	0%	100%	0%	100%	0%	0%	0%	67%	33%	
	PEAK HR FACTOR		0.417			0.500			0.250			0.375		0.500
	APP/DEPART	5	/	7	2	/	2	1	/	1	6	/	4	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	1	0	0	1	1	0	0	0	0	3
	4:15 PM	0	0	0	0	0	1	0	1	0	0	1	0	3
	4:30 PM	0	0	1	0	0	1	1	1	0	0	2	0	6
	4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
	5:00 PM	0	0	0	0	0	1	1	1	0	0	0	0	3
	5:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
	5:30 PM	0	0	0	0	1	1	0	0	0	0	1	0	3
	5:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	2
	VOLUMES	0	0	1	1	2	6	3	5	0	0	4	0	22
	APPROACH %	0%	0%	100%	11%	22%	67%	38%	63%	0%	0%	100%	0%	
	APP/DEPART	1	/	3	9	/	2	8	/	7	4	/	10	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	0	1	1	0	3	2	3	0	0	3	0	13
	APPROACH %	0%	0%	100%	25%	0%	75%	40%	60%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.250			1.000			0.625			0.375		0.542
	APP/DEPART	1	/	2	4	/	0	5	/	5	3	/	6	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

1	0	0	0

0	0	0	0

Ramona

NORTH SIDE

Chino Hills WEST SIDE EAST SIDE **Chino Hills**

SOUTH SIDE

Ramona

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Ramona	LOCATION #:	3
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND (Ramona)			SOUTHBOUND (Ramona)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 2.5	ER 0.5	WL 1	WT 2	WR 1	TOTAL
7:00 AM	0	0	0	0	1	3	2	1	0	0	0	0	7
7:15 AM	0	1	0	0	1	1	3	1	0	0	0	0	7
7:30 AM	0	0	1	1	2	4	1	3	0	0	2	0	14
7:45 AM	0	0	0	0	0	2	1	2	0	0	1	1	7
8:00 AM	0	1	0	1	0	3	3	3	0	0	0	0	11
8:15 AM	0	0	0	0	1	2	5	3	0	0	2	0	13
8:30 AM	0	0	0	0	1	2	2	2	0	1	2	1	11
8:45 AM	0	3	0	0	0	3	0	3	0	0	1	0	10
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	5	1	2	6	20	17	18	0	1	8	2	80
APPROACH %	0%	83%	17%	7%	21%	71%	49%	51%	0%	9%	73%	18%	
APP/DEPART	6	/	24	28	/	7	35	/	21	11	/	28	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	0	1	1	2	3	11	10	11	0	0	5	1	45
APPROACH %	0%	50%	50%	13%	19%	69%	48%	52%	0%	0%	83%	17%	
PEAK HR FACTOR		0.167			0.571			0.656			0.375		0.804
APP/DEPART	2	/	12	16	/	3	21	/	14	6	/	16	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	2	0	1	3	0	1	0	0	1	1	0	9
4:15 PM	0	0	0	0	0	2	2	2	0	0	2	0	8
4:30 PM	0	1	0	0	0	2	1	1	0	0	1	1	7
4:45 PM	0	0	0	0	2	1	0	1	0	0	1	0	5
5:00 PM	0	0	0	0	0	0	0	2	0	1	6	0	9
5:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
5:30 PM	0	1	0	0	0	1	0	1	0	0	3	0	6
5:45 PM	0	1	0	0	0	0	1	1	0	0	0	0	3
VOLUMES	0	5	0	1	5	6	5	10	0	2	14	1	49
APPROACH %	0%	100%	0%	8%	42%	50%	33%	67%	0%	12%	82%	6%	
APP/DEPART	5	/	11	12	/	7	15	/	11	17	/	20	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	3	0	1	5	5	4	4	0	1	5	1	29
APPROACH %	0%	100%	0%	9%	45%	45%	50%	50%	0%	14%	71%	14%	
PEAK HR FACTOR		0.375			0.688			0.500			0.250		0.806
APP/DEPART	3	/	8	11	/	6	8	/	5	7	/	10	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	1	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	1	0	0
0	1	0	0
0	1	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	5	0	0
0	3	0	0
0	0	0	0
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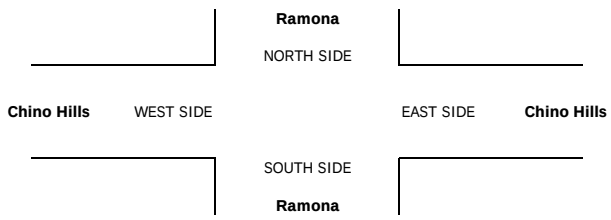
0	1	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16	LOCATION:	Chino	PROJECT #: SC0952
	NORTH & SOUTH:	Monte Vista	LOCATION #: 4
	EAST & WEST:	Chino Hills	CONTROL: STOP N

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

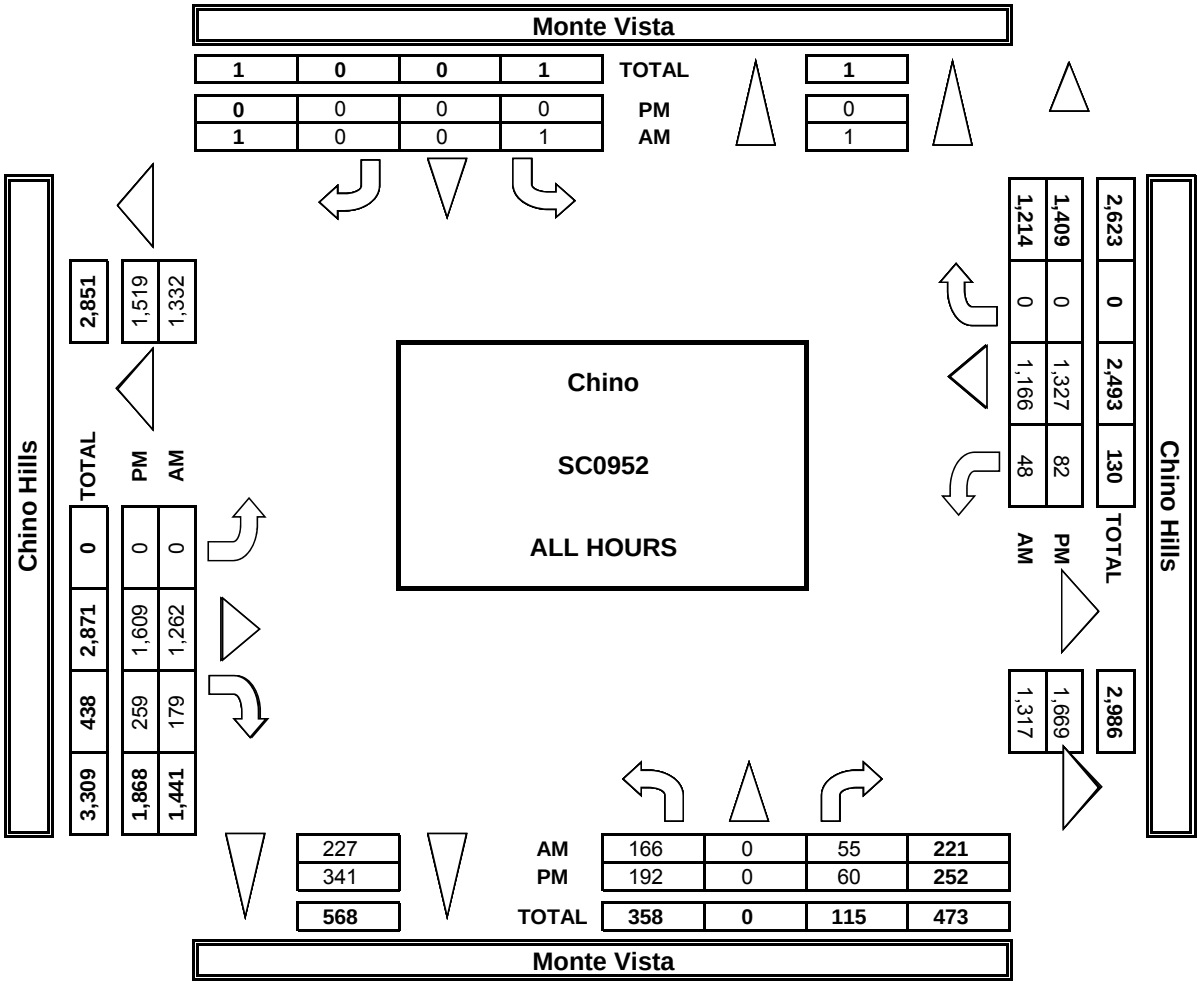
Add U-Turns to Left Turns

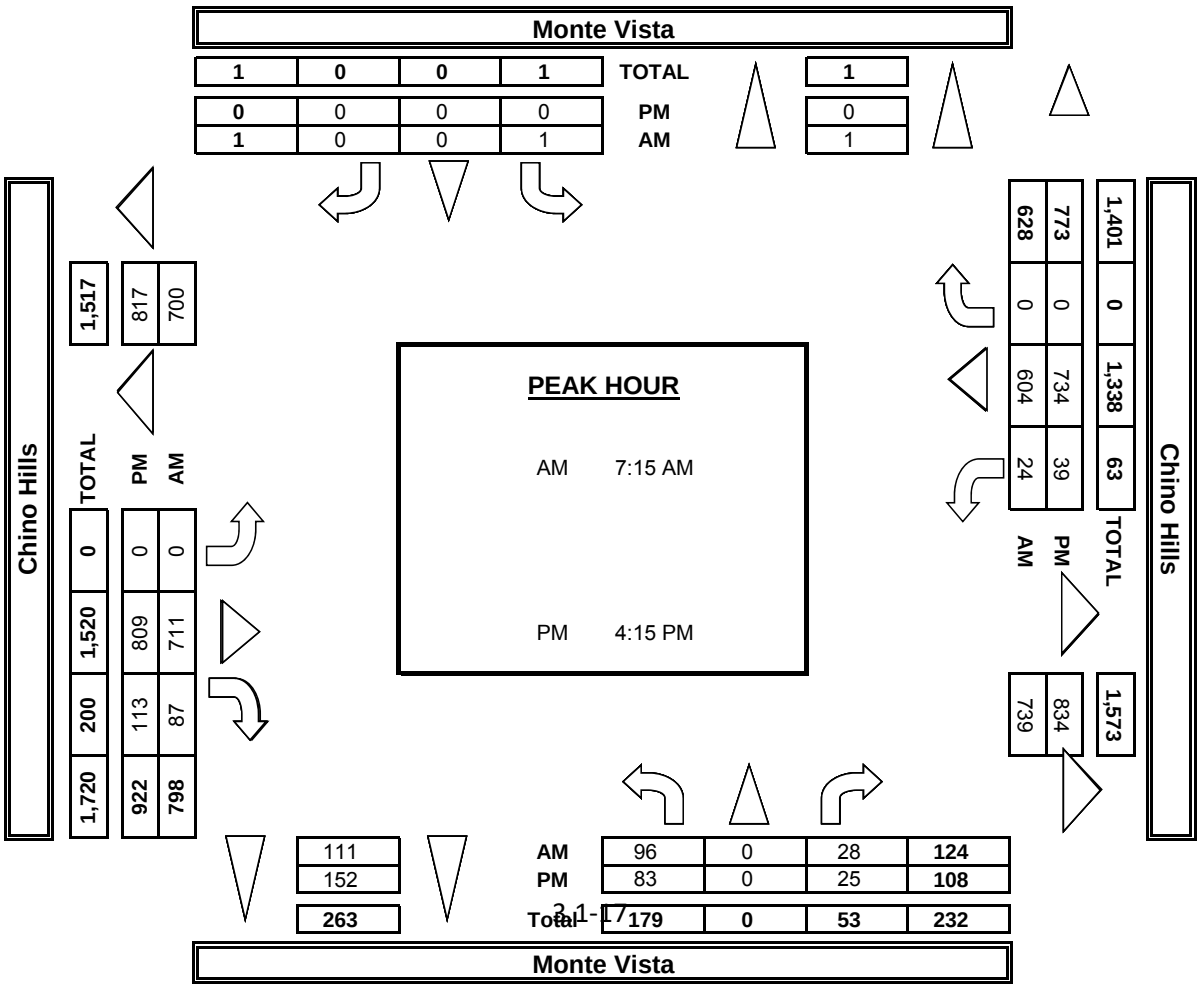
		NORTHBOUND Monte Vista			SOUTHBOUND Monte Vista			EASTBOUND Chino Hills			WESTBOUND Chino Hills				U-TURNS					RTOR			
	LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 1	WL 1	WT 2	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	20	0	8	0	0	0	0	137	11	9	122	0	307	0	0	0	0	0	7	0	10	0
	7:15 AM	24	0	8	0	0	0	0	150	20	12	174	0	388	0	0	0	0	0	5	0	17	0
	7:30 AM	24	0	7	0	0	0	0	137	23	4	125	0	320	0	0	0	0	0	6	0	20	0
	7:45 AM	23	0	6	1	0	0	0	211	21	4	149	0	415	0	1	0	0	1	6	0	20	0
	8:00 AM	25	0	7	0	0	0	0	213	23	4	156	0	428	0	0	0	0	0	6	0	19	0
	8:15 AM	19	0	7	0	0	0	0	169	29	3	135	0	362	0	0	0	0	0	5	0	28	0
	8:30 AM	16	0	6	0	0	0	0	131	28	6	159	0	346	0	0	0	0	0	3	0	23	0
	8:45 AM	15	0	6	0	0	0	0	114	24	6	146	0	311	0	0	0	0	0	6	0	24	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	166	0	55	1	0	0	0	1,262	179	48	1,166	0	2,877	0	1	0	0	1	44	0	161	0
	APPROACH %	75%	0%	25%	100%	0%	0%	0%	88%	12%	4%	96%	0%										
	APP/DEPART	221	/	1	1	/	227	1,441	/	1,317	1,214	/	1,332	0									
	BEGIN PEAK HR		7:15 AM																				
	VOLUMES	96	0	28	1	0	0	0	711	87	24	604	0	1,551						23	0	76	0
	APPROACH %	77%	0%	23%	100%	0%	0%	0%	89%	11%	4%	96%	0%										
	PEAK HR FACTOR		0.969			0.250			0.845			0.844		0.906									
	APP/DEPART	124	/	1	1	/	111	798	/	739	628	/	700	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	25	0	8	0	0	0	0	183	41	5	178	0	440	0	0	0	0	0	7	0	41	0
	4:15 PM	19	0	5	0	0	0	0	211	26	10	156	0	427	0	0	0	0	0	4	0	24	0
	4:30 PM	21	0	6	0	0	0	0	198	28	5	195	0	453	0	0	0	0	0	4	0	28	0
	4:45 PM	20	0	3	0	0	0	0	187	29	13	170	0	422	0	0	0	0	0	3	0	26	0
	5:00 PM	23	0	11	0	0	0	0	213	30	11	213	0	501	0	0	0	0	0	11	0	30	0
	5:15 PM	23	0	7	0	0	0	0	205	32	15	135	0	417	0	0	0	0	0	7	0	32	0
	5:30 PM	28	0	8	0	0	0	0	188	37	13	142	0	416	0	0	0	0	0	8	0	37	0
	5:45 PM	33	0	12	0	0	0	0	224	36	10	138	0	453	0	0	0	0	0	12	0	36	0
	VOLUMES	192	0	60	0	0	0	0	1,609	259	82	1,327	0	3,529	0	0	0	0	0	56	0	254	0
	APPROACH %	76%	0%	24%	0%	0%	0%	0%	86%	14%	6%	94%	0%										
	APP/DEPART	252	/	0	0	/	341	1,868	/	1,669	1,409	/	1,519	0									
	BEGIN PEAK HR		4:15 PM																				
	VOLUMES	83	0	25	0	0	0	0	809	113	39	734	0	1,803						22	0	108	0
	APPROACH %	77%	0%	23%	0%	0%	0%	0%	88%	12%	5%	95%	0%										
	PEAK HR FACTOR		0.794			0.000			0.949			0.863		0.900									
	APP/DEPART	108	/	0	0	/	152	922	/	834	773	/	817	0									

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	4	0	4	0	0	0	0	0	0	0	4	0	4
	8:45 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	5	0	5	0	0	1	0	1	0	0	4	0	4
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	1	3	0	4	0	0	3	0	3	0	1	0	0	1
	4:15 PM	0	0	2	0	2	0	0	1	0	1	0	0	1	0	1
	4:30 PM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	1	8	1	10	0	0	6	0	6	0	1	2	1	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Monte Vista	LOCATION #:	4
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	STOP N

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Monte Vista			SOUTHBOUND Monte Vista			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 1	WL 1	WT 2	WR X	TOTAL
7:00 AM	3	0	1	0	0	0	0	1	0	0	1	0	6
7:15 AM	6	0	1	0	0	0	0	0	4	1	2	0	14
7:30 AM	4	0	0	0	0	0	0	1	1	1	0	0	7
7:45 AM	3	0	1	0	0	0	0	0	3	0	2	0	9
8:00 AM	2	0	1	0	0	0	0	2	4	3	1	0	13
8:15 AM	4	0	0	0	0	0	0	2	3	0	1	0	10
8:30 AM	1	0	0	0	0	0	0	1	2	1	1	0	6
8:45 AM	3	0	0	0	0	0	0	0	3	1	2	0	9
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	26	0	4	0	0	0	0	7	20	7	10	0	74
APPROACH %	87%	0%	13%	0%	0%	0%	0%	26%	74%	41%	59%	0%	
APP/DEPART	30	/	0	0	/	27	27	/	11	17	/	36	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	15	0	3	0	0	0	0	3	12	5	5	0	43
APPROACH %	83%	0%	17%	0%	0%	0%	0%	20%	80%	50%	50%	0%	
PEAK HR FACTOR		0.643			0.000			0.625			0.625		0.768
APP/DEPART	18	/	0	0	/	17	15	/	6	10	/	20	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	5	0	1	0	0	0	0	0	3	0	0	0	9
4:15 PM	2	0	0	0	0	0	0	1	2	2	2	0	9
4:30 PM	0	0	0	0	0	0	0	2	1	3	0	0	6
4:45 PM	1	0	1	0	0	0	0	1	6	2	0	0	11
5:00 PM	2	0	3	0	0	0	0	2	2	1	0	0	10
5:15 PM	3	0	0	0	0	0	0	2	4	2	1	0	12
5:30 PM	1	0	0	0	0	0	0	1	1	4	0	0	7
5:45 PM	2	0	1	0	0	0	0	0	2	0	2	0	7
VOLUMES	16	0	6	0	0	0	0	9	21	14	5	0	71
APPROACH %	73%	0%	27%	0%	0%	0%	0%	30%	70%	74%	26%	0%	
APP/DEPART	22	/	0	0	/	35	30	/	15	19	/	21	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	7	0	4	0	0	0	0	6	13	9	1	0	40
APPROACH %	64%	0%	36%	0%	0%	0%	0%	32%	68%	90%	10%	0%	
PEAK HR FACTOR		0.550			0.000			0.679			0.625		0.833
APP/DEPART	11	/	0	0	/	22	19	/	10	10	/	8	0

U-TURNS

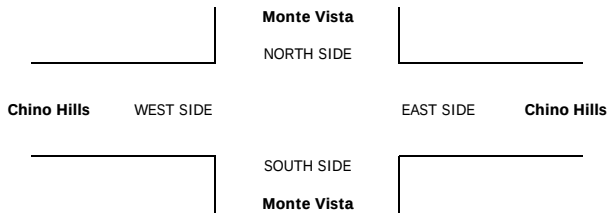
NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
1	0	0	0
1	0	3	0
0	0	1	0
1	0	3	0
1	0	3	0
0	0	3	0
0	0	1	0
0	0	3	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
4	0	17	0
3	0	10	0

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	3	0
0	0	2	0
0	0	1	0
1	0	6	0
3	0	2	0
0	0	4	0
0	0	1	0
1	0	2	0
6	0	21	0
4	0	13	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Monte Vista	LOCATION #:	4
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	STOP N

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Monte Vista)			SOUTHBOUND (Monte Vista)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 1	WL 1	WT 2	WR X	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:00 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:30 AM	1	0	0	0	0	0	0	1	0	0	3	0	5
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	0	0	0	0	0	0	3	0	0	10	0	14
APPROACH %	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	1	/	0	0	/	0	3	/	3	10	/	11	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	1	0	0	0	0	0	0	2	0	0	7	0	10
APPROACH %	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.250			0.000			0.500			0.583		0.500
APP/DEPART	1	/	0	0	/	0	2	/	2	7	/	8	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	2	0	0	3	0	5
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
VOLUMES	0	0	0	0	0	0	0	5	0	0	3	0	8
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	0	5	/	5	3	/	3	0
BEGIN PEAK HR		3:45 PM											
VOLUMES	0	0	0	0	0	0	0	3	0	0	3	0	6
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.375			0.250		0.300
APP/DEPART	0	/	0	0	/	0	3	/	3	3	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Monte Vista NORTH SIDE

Chino Hills WEST SIDE EAST SIDE **Chino Hills**

SOUTH SIDE **Monte Vista**

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Monte Vista	LOCATION #:	4
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	STOP N

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Monte Vista			SOUTHBOUND Monte Vista			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
	LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 1	WL 1	WT 2	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	2
	7:15 AM	0	0	0	0	0	0	0	1	0	1	2	0	4
	7:30 AM	0	0	0	0	0	0	0	3	0	0	1	0	4
	7:45 AM	0	0	0	0	0	0	0	4	0	0	2	0	6
	8:00 AM	0	0	0	0	0	0	0	4	0	0	1	0	5
	8:15 AM	0	0	0	0	0	0	0	3	0	0	2	0	5
	8:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
	8:45 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	20	0	1	11	0	32
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	8%	92%	0%	
	APP/DEPART	0	/	0	0	/	1	20	/	20	12	/	11	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	0	0	0	0	0	0	0	14	0	0	6	0	20
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.000			0.875			0.750		0.833
	APP/DEPART	0	/	0	0	/	0	14	/	14	6	/	6	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
	4:15 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
	4:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
	4:45 PM	0	0	0	0	0	0	0	1	0	0	3	0	4
	5:00 PM	0	0	0	0	0	0	0	2	0	0	3	0	5
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	1	0	0	4	0	5
	5:45 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
	VOLUMES	0	0	0	0	0	0	0	9	0	0	15	0	24
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	APP/DEPART	0	/	0	0	/	0	9	/	9	15	/	15	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	0	0	0	0	0	0	0	6	0	0	10	0	16
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.000			0.750			0.833		0.800
	APP/DEPART	0	/	0	0	/	0	6	/	6	10	/	10	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
Wed, May 18, 16	NORTH & SOUTH:	Monte Vista	LOCATION #:	5
	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

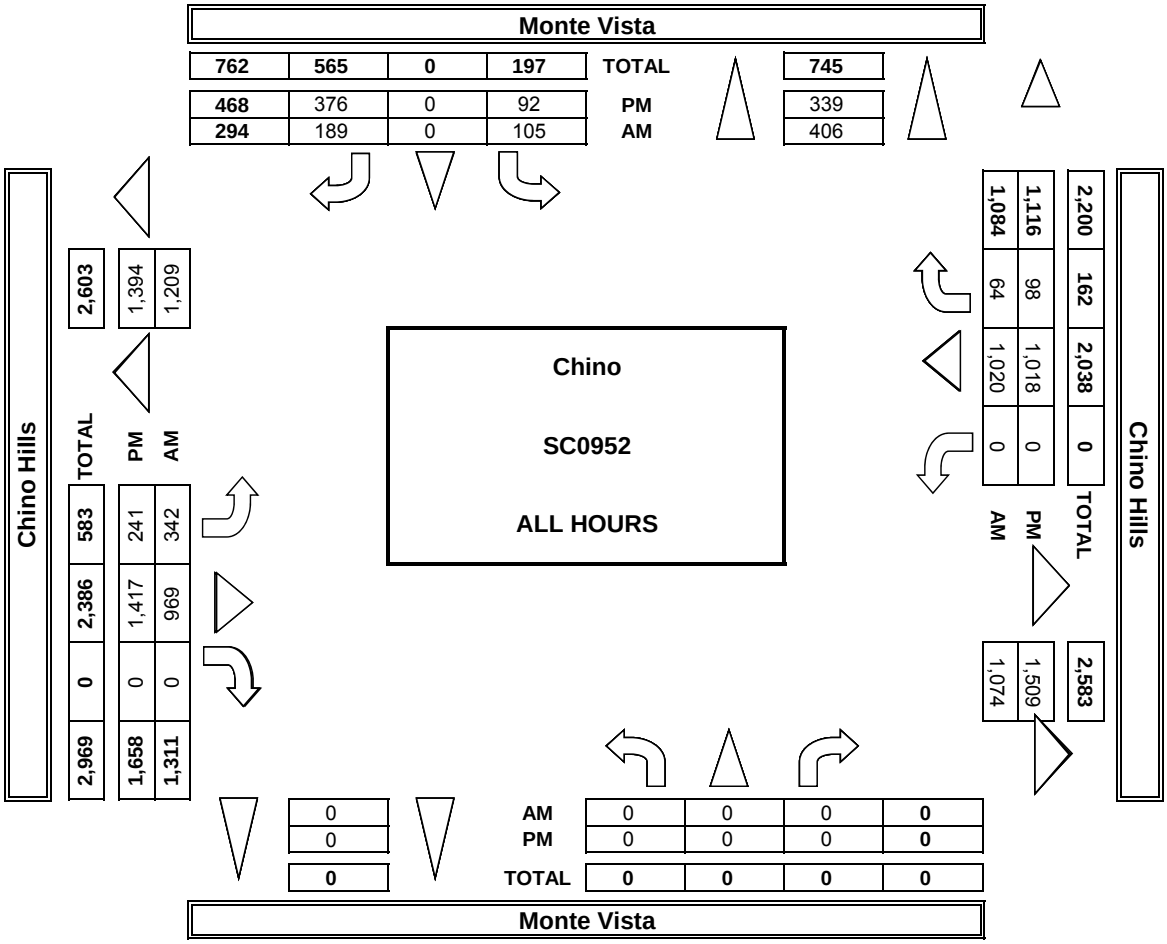
Add U-Turns to Left Turns

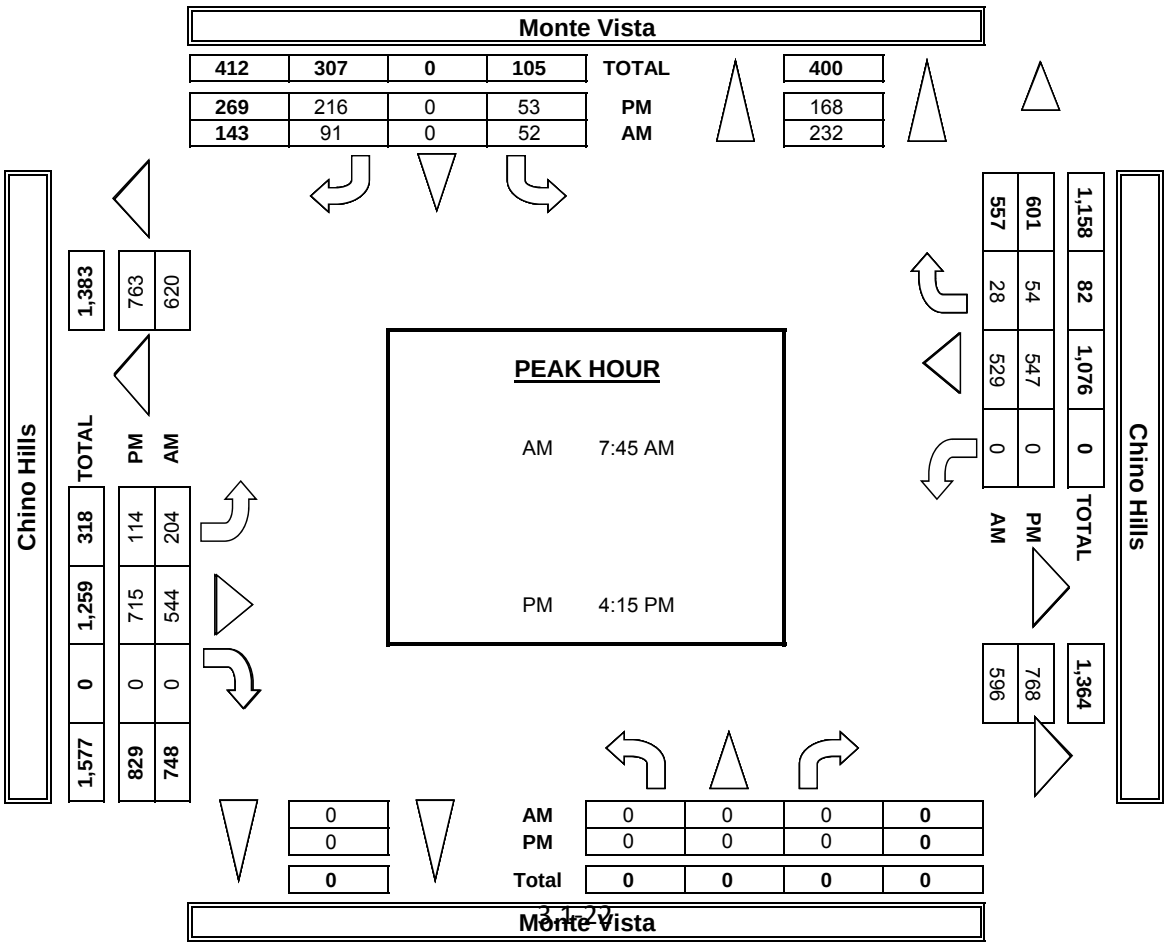
		NORTHBOUND (Monte Vista)			SOUTHBOUND (Monte Vista)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)				U-TURNS					RTOR			
	LANES:	NL X	NT X	NR X	SL 2	ST X	SR 1	EL 1	ET 2	ER X	WL X	WT 2	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	0	0	13	0	23	34	111	0	0	113	7	301	0	0	0	0	0	0	18	0	0
	7:15 AM	0	0	0	16	0	28	34	124	0	0	152	9	363	0	0	0	0	0	0	21	0	0
	7:30 AM	0	0	0	12	0	21	39	105	0	0	109	10	296	0	0	0	0	0	0	20	0	0
	7:45 AM	0	0	0	20	0	24	58	156	0	0	129	4	391	0	0	0	0	0	0	17	0	0
	8:00 AM	0	0	0	11	0	21	59	162	0	0	133	7	393	0	0	0	0	0	0	21	0	0
	8:15 AM	0	0	0	10	0	23	49	127	0	0	119	10	338	0	0	0	0	0	0	20	0	0
	8:30 AM	0	0	0	11	0	23	38	99	0	0	148	7	326	0	0	0	0	0	0	11	0	0
	8:45 AM	0	0	0	12	0	26	31	85	0	0	117	10	281	0	0	0	0	0	0	22	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	105	0	189	342	969	0	0	1,020	64	2,689	0	0	0	0	0	0	150	0	1
	APPROACH %	0%	0%	0%	36%	0%	64%	26%	74%	0%	0%	94%	6%										
	APP/DEPART	0	/	406	294	/	0	1,311	/	1,074	1,084	/	1,209	0									
	BEGIN PEAK HR		7:45 AM																				
	VOLUMES	0	0	0	52	0	91	204	544	0	0	529	28	1,448						0	69	0	0
	APPROACH %	0%	0%	0%	36%	0%	64%	27%	73%	0%	0%	95%	5%										
	PEAK HR FACTOR		0.000			0.813			0.846			0.898		0.921									
	APP/DEPART	0	/	232	143	/	0	748	/	596	557	/	620	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	9	0	40	31	159	0	0	150	21	410	0	0	0	0	0	0	40	0	0
	4:15 PM	0	0	0	13	0	44	30	185	0	0	119	14	405	0	0	0	0	0	0	40	0	0
	4:30 PM	0	0	0	21	0	40	27	174	0	0	157	20	439	0	0	0	0	0	0	24	0	1
	4:45 PM	0	0	0	7	0	60	29	159	0	0	127	11	393	0	0	0	0	0	0	49	0	1
	5:00 PM	0	0	0	12	0	72	28	197	0	0	144	9	462	0	0	0	0	0	0	58	0	0
	5:15 PM	0	0	0	7	0	40	33	176	0	0	104	12	372	0	0	0	0	0	0	38	0	1
	5:30 PM	0	0	0	14	0	44	32	164	0	0	110	6	370	0	0	0	0	0	0	35	0	0
	5:45 PM	0	0	0	9	0	36	31	203	0	0	107	5	391	0	0	0	0	0	0	29	0	0
	VOLUMES	0	0	0	92	0	376	241	1,417	0	0	1,018	98	3,242	0	0	0	0	0	0	313	0	3
	APPROACH %	0%	0%	0%	20%	0%	80%	15%	85%	0%	0%	91%	9%										
	APP/DEPART	0	/	339	468	/	0	1,658	/	1,509	1,116	/	1,394	0									
	BEGIN PEAK HR		4:15 PM																				
	VOLUMES	0	0	0	53	0	216	114	715	0	0	547	54	1,699						0	171	0	2
	APPROACH %	0%	0%	0%	20%	0%	80%	14%	86%	0%	0%	91%	9%										
	PEAK HR FACTOR		0.000			0.801			0.921			0.849		0.919									
	APP/DEPART	0	/	168	269	/	0	829	/	768	601	/	763	0									

	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4
	8:45 AM	0	1	0	1	2	0	1	0	1	2	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	6	0	1	7	0	2	0	1	3	0	4	0	0	4
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	4:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	4:30 PM	0	1	0	1	2	0	1	0	1	2	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	2	2	2	6	0	2	0	1	3	0	0	2	1	3

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Monte Vista	LOCATION #:	5
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Monte Vista)			SOUTHBOUND (Monte Vista)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
LANES:	NL X	NT X	NR X	SL 2	ST X	SR 1	EL 1	ET 2	ER X	WL X	WT 2	WR 0	TOTAL
7:00 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
7:15 AM	0	0	0	0	0	0	0	1	0	0	3	0	4
7:30 AM	0	0	0	0	0	0	0	1	0	0	1	1	3
7:45 AM	0	0	0	0	0	0	1	0	0	0	2	0	3
8:00 AM	0	0	0	1	0	1	1	0	0	0	1	1	5
8:15 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
8:30 AM	0	0	0	2	0	0	1	0	0	0	2	0	5
8:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	3	0	1	3	6	0	0	14	2	29
APPROACH %	0%	0%	0%	75%	0%	25%	33%	67%	0%	0%	88%	13%	
APP/DEPART	0	/	5	4	/	0	9	/	9	16	/	15	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	0	0	0	3	0	1	3	2	0	0	6	1	16
APPROACH %	0%	0%	0%	75%	0%	25%	60%	40%	0%	0%	86%	14%	
PEAK HR FACTOR		0.000			0.500			0.625			0.583		0.800
APP/DEPART	0	/	4	4	/	0	5	/	5	7	/	7	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	1	0	0	4	0	5
4:30 PM	0	0	0	0	0	0	1	1	0	0	2	0	4
4:45 PM	0	0	0	0	0	1	0	2	0	0	3	0	6
5:00 PM	0	0	0	0	0	0	3	2	0	0	2	0	7
5:15 PM	0	0	0	0	0	1	0	2	0	0	3	0	6
5:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	1	0	0	0	2	0	3
VOLUMES	0	0	0	1	0	3	5	9	0	0	16	0	34
APPROACH %	0%	0%	0%	25%	0%	75%	36%	64%	0%	0%	100%	0%	
APP/DEPART	0	/	5	4	/	0	14	/	10	16	/	19	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	0	0	0	0	0	2	4	7	0	0	10	0	23
APPROACH %	0%	0%	0%	0%	0%	100%	36%	64%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.500			0.550			0.833		0.821
APP/DEPART	0	/	4	2	/	0	11	/	7	10	/	12	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

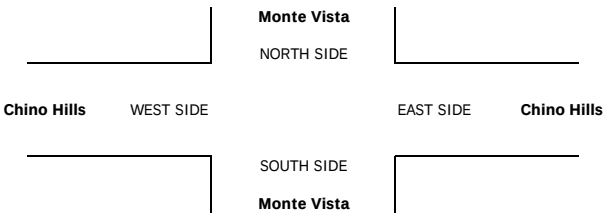
RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0

0	1	0	0

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	1	0	0
0	1	0	0
0	0	0	0
0	3	0	0

0	2	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Monte Vista	LOCATION #:	5
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Monte Vista)			SOUTHBOUND (Monte Vista)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
	LANES:	NL X	NT X	NR X	SL 2	ST X	SR 1	EL 1	ET 2	ER X	WL X	WT 2	WR 0	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	3	0	3
	7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
	7:30 AM	0	0	0	1	0	0	1	0	0	0	0	1	3
	7:45 AM	0	0	0	2	0	0	0	0	0	0	1	0	3
	8:00 AM	0	0	0	0	0	0	0	1	0	0	1	1	3
	8:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
	8:30 AM	0	0	0	0	0	1	0	1	0	0	2	0	4
	8:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	4	0	1	1	2	0	0	10	2	20
	APPROACH %	0%	0%	0%	80%	0%	20%	33%	67%	0%	0%	83%	17%	
	APP/DEPART	0	/	3	5	/	0	3	/	6	12	/	11	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	0	0	0	2	0	1	0	2	0	0	6	1	12
	APPROACH %	0%	0%	0%	67%	0%	33%	0%	100%	0%	0%	86%	14%	
	PEAK HR FACTOR		0.000			0.375			0.500			0.875		0.750
	APP/DEPART	0	/	1	3	/	0	2	/	4	7	/	7	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	2
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	1	0	2	0	2	0	0	1	1	7
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	2
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
	VOLUMES	0	0	0	1	0	2	2	4	0	0	1	2	12
	APPROACH %	0%	0%	0%	33%	0%	67%	33%	67%	0%	0%	33%	67%	
	APP/DEPART	0	/	4	3	/	0	6	/	5	3	/	3	0
	BEGIN PEAK HR		3:45 PM											
	VOLUMES	0	0	0	1	0	2	0	3	0	0	1	2	9
	APPROACH %	0%	0%	0%	33%	0%	67%	0%	100%	0%	0%	33%	67%	
	PEAK HR FACTOR		0.000			0.250			0.375			0.375		0.321
	APP/DEPART	0	/	2	3	/	0	3	/	4	3	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Monte Vista	LOCATION #:	5
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Monte Vista			SOUTHBOUND Monte Vista			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
LANES:	NL X	NT X	NR X	SL 2	ST X	SR 1	EL 1	ET 2	ER X	WL X	WT 2	WR 0	TOTAL
7:00 AM	0	0	0	2	0	0	1	1	0	0	0	0	4
7:15 AM	0	0	0	3	0	0	0	1	0	0	3	0	7
7:30 AM	0	0	0	1	0	0	1	2	0	0	1	0	5
7:45 AM	0	0	0	0	0	0	0	4	0	0	2	0	6
8:00 AM	0	0	0	0	0	0	2	3	0	0	2	0	7
8:15 AM	0	0	0	0	0	0	3	0	0	0	2	0	5
8:30 AM	0	0	0	0	0	0	0	1	0	0	2	1	4
8:45 AM	0	0	0	0	0	1	1	1	0	0	0	1	4
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	6	0	1	8	13	0	0	12	2	42
APPROACH %	0%	0%	0%	86%	0%	14%	38%	62%	0%	0%	86%	14%	
APP/DEPART	0	/	10	7	/	0	21	/	19	14	/	13	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	0	0	0	4	0	0	3	10	0	0	8	0	25
APPROACH %	0%	0%	0%	100%	0%	0%	23%	77%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.333			0.650			0.667		0.893
APP/DEPART	0	/	3	4	/	0	13	/	14	8	/	8	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	2	3
4:15 PM	0	0	0	1	0	2	1	1	0	0	0	2	7
4:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
4:45 PM	0	0	0	0	0	2	0	1	0	0	1	0	4
5:00 PM	0	0	0	1	0	1	0	2	0	0	4	0	8
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
5:30 PM	0	0	0	2	0	2	0	1	0	0	2	0	7
5:45 PM	0	0	0	1	0	1	0	1	0	0	0	0	3
VOLUMES	0	0	0	5	0	8	1	8	0	0	9	5	36
APPROACH %	0%	0%	0%	38%	0%	62%	11%	89%	0%	0%	64%	36%	
APP/DEPART	0	/	6	13	/	0	9	/	13	14	/	17	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	0	0	0	2	0	5	1	5	0	0	7	2	22
APPROACH %	0%	0%	0%	29%	0%	71%	17%	83%	0%	0%	78%	22%	
PEAK HR FACTOR		0.000			0.583			0.750			0.563		0.688
APP/DEPART	0	/	3	7	/	0	6	/	7	9	/	12	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0

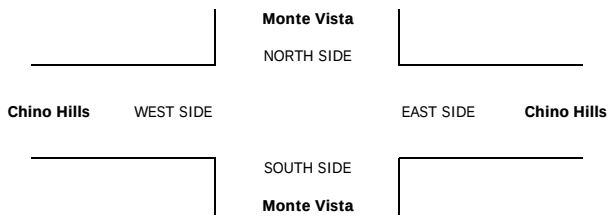
0	0	0	0

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	2	0	0
0	0	0	0
0	2	0	0
0	1	0	0
0	0	0	0
0	2	0	0
0	0	0	0
0	7	0	0

0	5	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: Central
EAST & WEST: Chino Hills

PROJECT #: SC0952
LOCATION #: 6
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND Central			SOUTHBOUND Central			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1.5	ET 0.5	ER 1	WL 1	WT 1	WR 1	TOTAL
AM	7:00 AM	57	148	10	15	222	52	40	17	52	1	1	6	621
	7:15 AM	93	198	10	17	179	69	65	10	38	0	1	0	680
	7:30 AM	66	194	11	20	128	51	64	12	34	1	1	3	585
	7:45 AM	69	177	14	15	139	55	61	17	54	0	0	3	604
	8:00 AM	73	188	8	10	140	62	95	11	46	1	1	1	636
	8:15 AM	76	195	4	2	140	42	88	6	43	1	0	2	599
	8:30 AM	69	186	2	2	137	81	61	7	28	1	0	0	574
	8:45 AM	66	175	4	1	146	54	58	3	36	7	1	4	555
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	569	1,461	63	82	1,231	466	532	83	331	12	5	19	4,854
	APPROACH %	27%	70%	3%	5%	69%	26%	56%	9%	35%	33%	14%	53%	
	APP/DEPART	2,093	/	2,013	1,779	/	1,574	946	/	227	36	/	1,040	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	301	757	43	62	586	237	285	50	172	2	3	7	2,505
	APPROACH %	27%	69%	4%	7%	66%	27%	56%	10%	34%	17%	25%	58%	
	PEAK HR FACTOR		0.914			0.835			0.834			0.600		0.921
	APP/DEPART	1,101	/	1,049	885	/	760	507	/	155	12	/	541	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	60	166	5	0	177	47	102	3	62	6	14	13	655
	4:15 PM	53	134	0	2	148	56	113	1	85	4	9	9	614
	4:30 PM	67	174	0	1	203	49	132	1	101	4	18	11	761
	4:45 PM	58	171	1	3	161	56	105	0	78	4	9	9	655
	5:00 PM	49	165	0	5	227	55	116	0	84	3	7	5	716
	5:15 PM	45	165	0	1	181	56	109	1	87	0	6	6	657
	5:30 PM	53	151	0	1	198	50	104	1	85	1	1	4	649
	5:45 PM	57	164	2	1	165	56	111	0	74	1	1	3	635
	VOLUMES	442	1,290	8	14	1,460	425	892	7	656	23	65	60	5,342
	APPROACH %	25%	74%	0%	1%	77%	22%	57%	0%	42%	16%	44%	41%	
	APP/DEPART	1,740	/	2,243	1,899	/	2,139	1,555	/	28	148	/	932	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	219	675	1	10	772	216	462	2	350	11	40	31	2,789
	APPROACH %	24%	75%	0%	1%	77%	22%	57%	0%	43%	13%	49%	38%	
	PEAK HR FACTOR		0.928			0.869			0.870			0.621		0.916
	APP/DEPART	895	/	1,168	998	/	1,133	814	/	13	82	/	475	0

U-TURNS					
	NB X	SB X	EB X	WB X	TTL
AM	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	1	0	0	1
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	1	0	0	1
PM	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	1	0	0	1

RTOR			
NRR 0	SRR 0	ERR 0	WRR 0
2	4	21	1
5	17	25	0
4	8	17	1
1	12	27	3
1	14	19	1
2	7	33	0
0	11	11	0
2	8	17	2
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
17	81	170	8
11	51	88	5
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	12	26	3
0	14	31	3
0	18	33	7
0	21	20	3
0	5	27	2
0	20	38	4
0	16	43	2
2	16	35	0
3	122	253	24
0	64	118	16

Central

NORTH SIDE

Chino Hills WEST SIDE EAST SIDE **Chino Hills**

SOUTH SIDE

Central

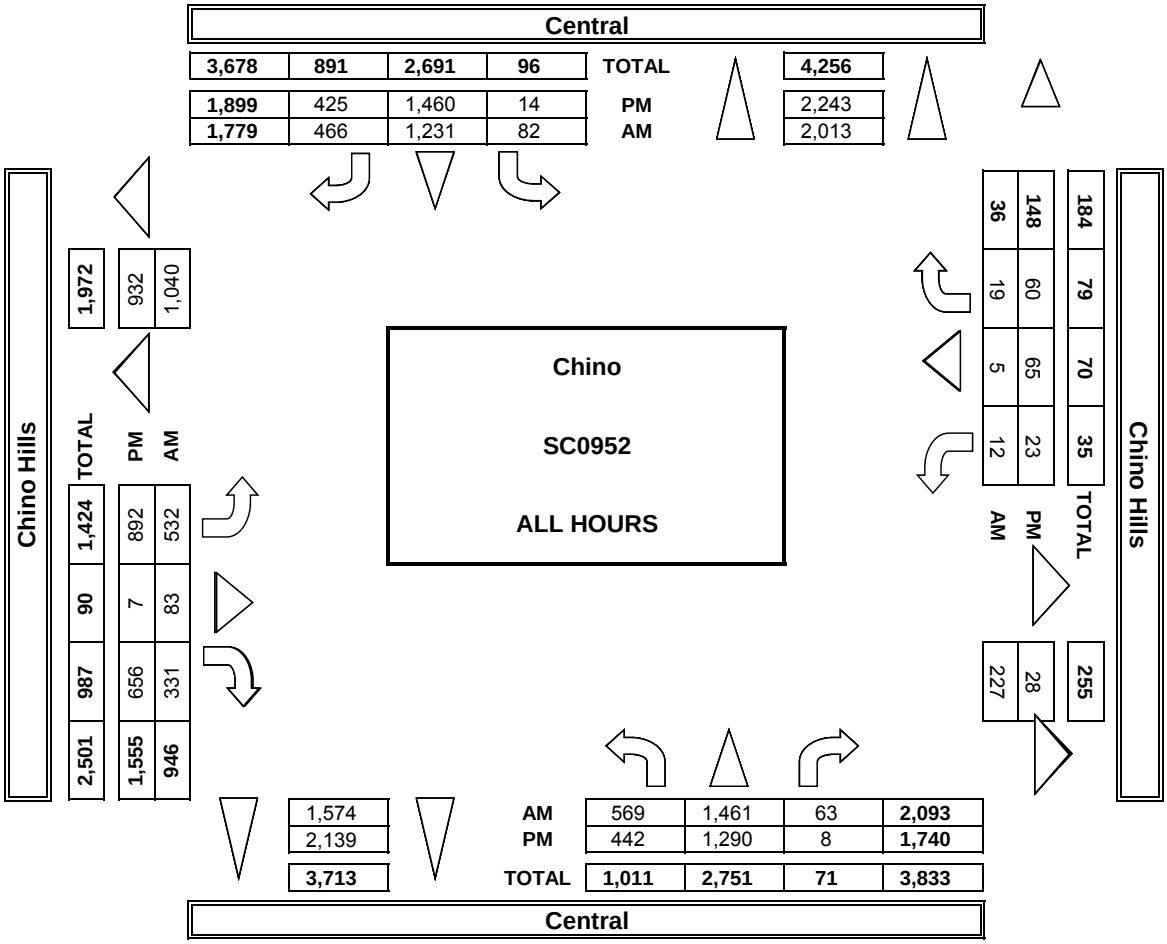
	ALL PED AND BIKE				
	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
AM 7:00 AM	0	1	0	0	1
7:15 AM	0	0	0	0	0
7:30 AM	1	0	0	0	1
7:45 AM	0	0	0	0	0
8:00 AM	0	1	0	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
TOTAL	1	2	0	0	3
PM 3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	0	0	1	0	1
4:15 PM	1	1	0	0	2
4:30 PM	1	0	0	1	2
4:45 PM	0	1	0	1	2
5:00 PM	0	1	0	0	1
5:15 PM	0	0	0	0	0
5:30 PM	1	2	0	0	3
5:45 PM	0	1	0	0	1
TOTAL	3	6	1	2	12

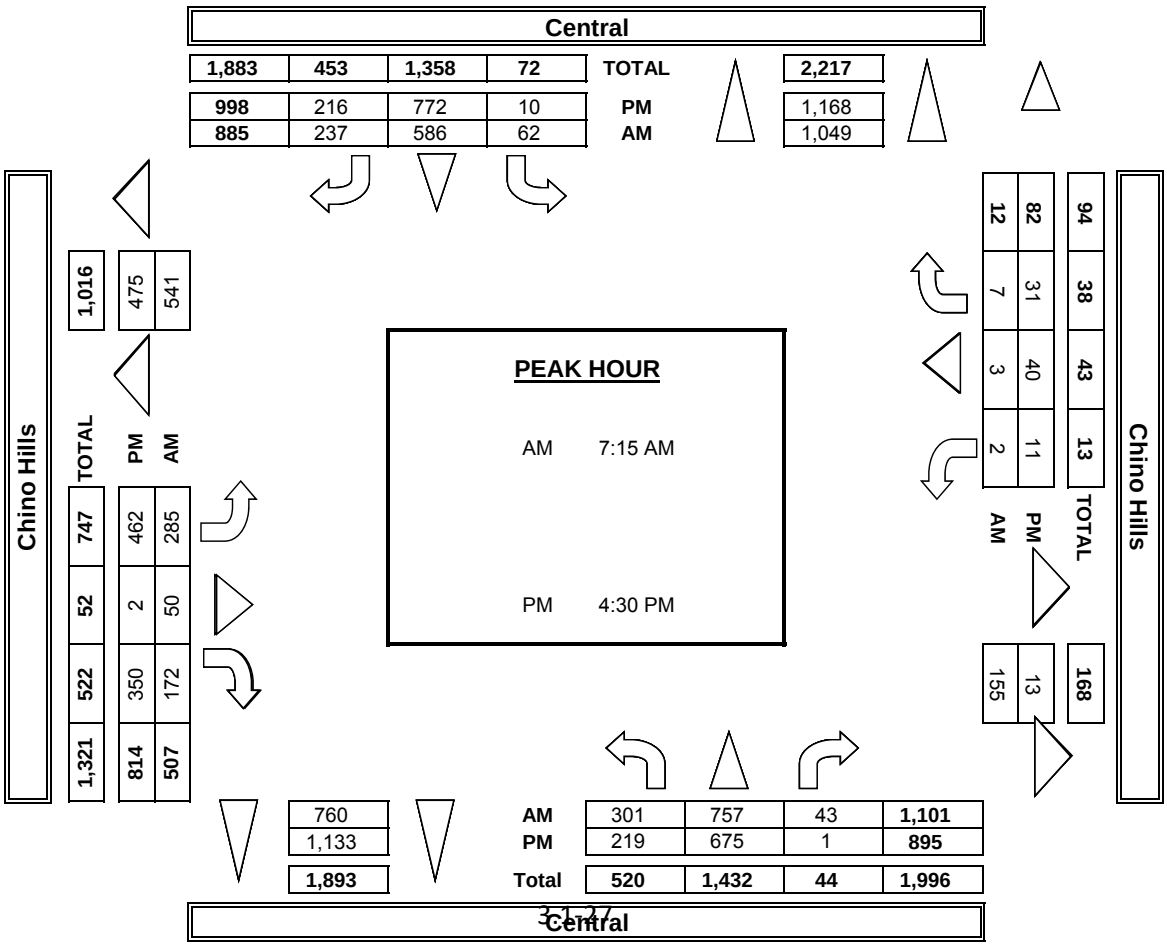
PEDESTRIAN CROSSINGS				
E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	1	0	2	4

BICYCLE CROSSINGS				
ES	WS	SS	NS	TOTAL
0	1	0	0	1
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	2	0	0	3
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
1	1	0	0	2
0	0	0	0	0
0	1	0	0	1
0	1	0	0	1
0	0	0	0	0
1	2	0	0	3
0	0	0	0	0
2	5	1	0	8

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	6
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Central)			SOUTHBOUND (Central)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1.5	ET 0.5	ER 1	WL 1	WT 1	WR 1	TOTAL
7:00 AM	0	9	0	0	7	2	1	0	0	0	0	1	20
7:15 AM	1	5	0	0	7	0	0	0	0	0	0	0	13
7:30 AM	0	5	0	0	11	0	0	0	0	0	0	0	16
7:45 AM	0	8	0	0	12	0	2	0	0	0	0	0	22
8:00 AM	1	8	0	0	12	1	1	0	1	0	0	0	24
8:15 AM	1	3	0	0	10	0	0	0	3	0	0	0	17
8:30 AM	1	4	0	0	12	0	4	0	0	0	0	0	21
8:45 AM	0	5	0	0	11	2	0	0	1	0	0	0	19
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	4	47	0	0	82	5	8	0	5	0	0	1	152
APPROACH %	8%	92%	0%	0%	94%	6%	62%	0%	38%	0%	0%	100%	
APP/DEPART	51	/	56	87	/	87	13	/	0	1	/	9	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	3	23	0	0	46	1	7	0	4	0	0	0	84
APPROACH %	12%	88%	0%	0%	98%	2%	64%	0%	36%	0%	0%	0%	
PEAK HR FACTOR		0.722			0.904			0.688			0.000		0.875
APP/DEPART	26	/	30	47	/	50	11	/	0	0	/	4	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	6	0	0	0	0	2	0	0	0	0	0	8
4:15 PM	1	7	0	0	7	1	0	0	2	0	0	0	18
4:30 PM	1	6	0	0	2	1	1	0	0	0	0	0	11
4:45 PM	1	7	0	0	6	0	2	0	2	0	0	0	18
5:00 PM	1	1	0	0	4	0	0	0	0	0	0	0	6
5:15 PM	1	2	0	0	3	0	0	0	1	0	0	0	7
5:30 PM	0	1	0	0	3	0	1	0	1	0	0	0	6
5:45 PM	2	4	0	0	0	0	4	0	0	0	0	0	10
VOLUMES	7	34	0	0	25	2	10	0	6	0	0	0	84
APPROACH %	17%	83%	0%	0%	93%	7%	63%	0%	38%	0%	0%	0%	
APP/DEPART	41	/	44	27	/	31	16	/	0	0	/	9	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	3	26	0	0	15	2	5	0	4	0	0	0	55
APPROACH %	10%	90%	0%	0%	88%	12%	56%	0%	44%	0%	0%	0%	
PEAK HR FACTOR		0.906			0.531			0.563			0.000		0.764
APP/DEPART	29	/	31	17	/	19	9	/	0	0	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	6
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Central)			SOUTHBOUND (Central)			EASTBOUND (Chino Hills)			WESTBOUND (Chino Hills)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1.5	ET 0.5	ER 1	WL 1	WT 1	WR 1	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	1	0	0	0	0	0	1	0	0	0	0	0	2
	7:30 AM	0	0	0	0	2	0	2	0	0	0	0	0	4
	7:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
	8:00 AM	1	1	0	0	1	0	0	0	2	0	0	0	5
	8:15 AM	0	1	0	0	0	2	2	0	0	0	0	0	5
	8:30 AM	0	1	0	0	2	1	0	0	1	0	0	0	5
	8:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	2	3	0	0	6	3	5	0	4	0	0	0	23
	APPROACH %	40%	60%	0%	0%	67%	33%	56%	0%	44%	0%	0%	0%	
	APP/DEPART	5	/	8	9	/	10	9	/	0	0	/	5	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	1	3	0	0	4	3	2	0	3	0	0	0	16
	APPROACH %	25%	75%	0%	0%	57%	43%	40%	0%	60%	0%	0%	0%	
	PEAK HR FACTOR		0.500			0.583			0.625			0.000		0.800
	APP/DEPART	4	/	5	7	/	7	5	/	0	0	/	4	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	2	0	0	0	1	0	0	0	0	0	0	3
	4:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	2
	4:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	2	0	0	1	0	0	0	0	0	0	0	3
	5:15 PM	0	1	0	0	0	0	0	0	1	0	0	0	2
	5:30 PM	0	0	0	0	2	1	1	0	1	0	0	0	5
	5:45 PM	0	1	0	0	0	0	1	0	0	0	0	1	3
	VOLUMES	0	7	0	0	4	2	2	0	3	0	0	1	19
	APPROACH %	0%	100%	0%	0%	67%	33%	40%	0%	60%	0%	0%	100%	
	APP/DEPART	7	/	10	6	/	7	5	/	0	1	/	2	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	0	4	0	0	3	1	2	0	2	0	0	1	13
	APPROACH %	0%	100%	0%	0%	75%	25%	50%	0%	50%	0%	0%	100%	
	PEAK HR FACTOR		0.500			0.333			0.500			0.250		0.650
	APP/DEPART	4	/	7	4	/	5	4	/	0	1	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	6
WEDNESDAY	EAST & WEST:	Chino Hills	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Central			SOUTHBOUND Central			EASTBOUND Chino Hills			WESTBOUND Chino Hills			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1.5	ET 0.5	ER 1	WL 1	WT 1	WR 1	TOTAL
AM	7:00 AM	2	1	0	0	0	0	0	0	2	0	0	0	5
	7:15 AM	2	3	0	0	6	1	0	0	1	0	0	0	13
	7:30 AM	1	2	0	0	1	1	1	0	1	0	0	0	7
	7:45 AM	1	2	0	0	4	0	0	0	3	0	0	0	10
	8:00 AM	1	2	0	0	2	0	1	0	2	0	0	0	8
	8:15 AM	1	2	0	0	1	0	0	0	1	0	0	0	5
	8:30 AM	0	4	0	0	1	0	1	0	2	0	0	0	8
	8:45 AM	3	2	0	0	4	0	1	0	0	0	0	0	10
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	11	18	0	0	19	2	4	0	12	0	0	0	66
	APPROACH %	38%	62%	0%	0%	90%	10%	25%	0%	75%	0%	0%	0%	
	APP/DEPART	29	/	22	21	/	31	16	/	0	0	/	13	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	5	9	0	0	13	2	2	0	7	0	0	0	38
	APPROACH %	36%	64%	0%	0%	87%	13%	22%	0%	78%	0%	0%	0%	
	PEAK HR FACTOR		0.700			0.536			0.750			0.000		0.731
	APP/DEPART	14	/	11	15	/	20	9	/	0	0	/	7	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	2	0	0	7	0	0	0	0	0	0	0	10
	4:15 PM	1	1	0	0	1	1	1	0	1	0	0	0	6
	4:30 PM	1	2	0	0	2	1	2	0	0	0	0	0	8
	4:45 PM	2	0	0	0	0	0	1	0	0	0	0	0	3
	5:00 PM	3	0	0	0	1	0	1	0	1	0	0	0	6
	5:15 PM	1	1	0	0	1	1	1	0	0	0	0	0	5
	5:30 PM	2	0	0	0	0	0	2	0	3	0	0	0	7
	5:45 PM	0	2	0	0	2	0	0	0	1	0	0	0	5
	VOLUMES	11	8	0	0	14	3	8	0	6	0	0	0	50
	APPROACH %	58%	42%	0%	0%	82%	18%	57%	0%	43%	0%	0%	0%	
	APP/DEPART	19	/	16	17	/	20	14	/	0	0	/	14	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	5	5	0	0	10	2	4	0	1	0	0	0	27
	APPROACH %	50%	50%	0%	0%	83%	17%	80%	0%	20%	0%	0%	0%	
	PEAK HR FACTOR		0.833			0.429			0.625			0.000		0.675
	APP/DEPART	10	/	9	12	/	11	5	/	0	0	/	7	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

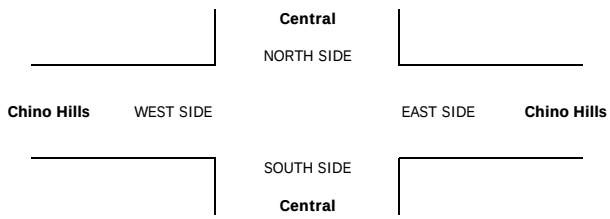
RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	1	1	0
0	0	1	0
0	0	0	0
0	0	1	0
0	0	1	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	5	0

NRR	SRR	ERR	WRR
0	1	3	0

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	2	0

NRR	SRR	ERR	WRR
0	0	1	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: Central
EAST & WEST: El Prado

PROJECT #: SC0952
LOCATION #: 7
CONTROL: SIGNAL

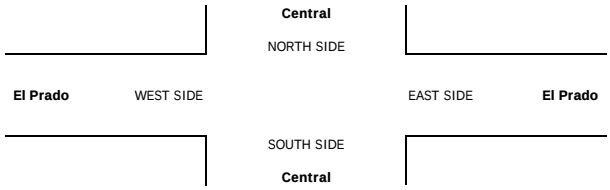
NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

Add U-Turns to Left Turns

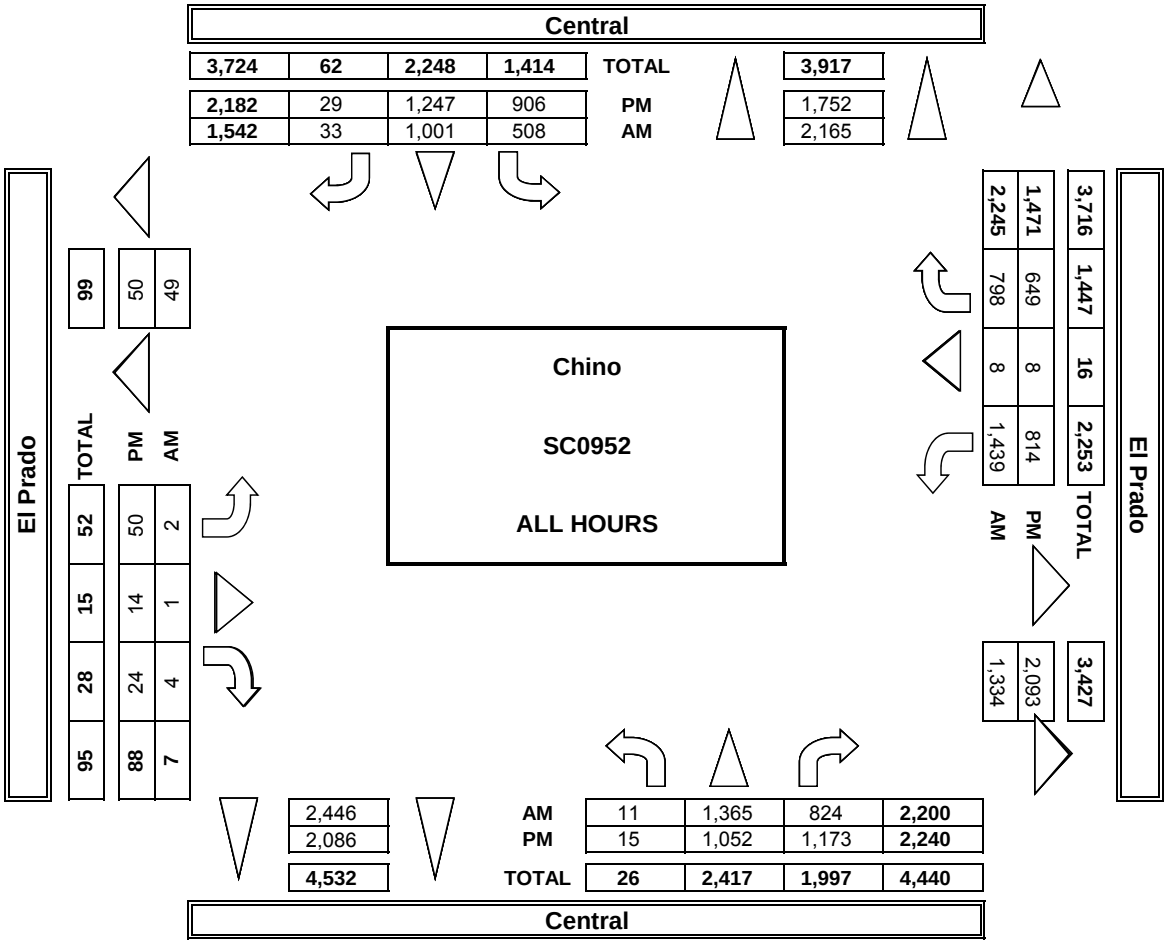
		NORTHBOUND Central			SOUTHBOUND Central			EASTBOUND El Prado			WESTBOUND El Prado				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 3	SR 0	EL 1	ET 1	ER 0	WL 1.5	WT 0.5	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	131	100	62	231	1	0	0	0	228	1	100	854	0	0	0	0	0	40	0	0	43
	7:15 AM	0	217	115	74	137	2	1	0	0	258	0	105	909	0	0	0	0	0	56	0	0	25
	7:30 AM	1	201	108	45	101	3	0	1	1	177	1	85	724	0	0	0	1	1	21	1	0	26
	7:45 AM	1	163	128	95	101	3	0	0	0	168	1	115	775	0	0	0	0	0	35	1	0	35
	8:00 AM	1	192	95	60	101	2	0	0	0	149	1	91	692	0	0	0	0	0	13	1	0	37
	8:15 AM	2	154	105	71	105	5	0	0	2	199	0	113	756	1	0	0	0	1	30	3	0	40
	8:30 AM	5	162	84	43	120	2	0	0	0	156	3	96	671	2	0	0	0	2	36	2	0	14
	8:45 AM	1	145	89	58	105	15	1	0	1	104	1	93	613	0	0	0	0	0	17	2	0	43
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	11	1,365	824	508	1,001	33	2	1	4	1,439	8	798	5,994	3	0	0	1	4	248	10	0	263
	APPROACH %	1%	62%	37%	33%	65%	2%	29%	14%	57%	64%	0%	36%										
	APP/DEPART	2,200	/	2,165	1,542	/	2,446	7	/	1,334	2,245	/	49	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	2	712	451	276	570	9	1	1	1	831	3	405	3,262						152	2	0	129
	APPROACH %	0%	61%	39%	32%	67%	1%	33%	33%	33%	67%	0%	33%										
	PEAK HR FACTOR		0.877			0.727			0.375			0.853		0.897									
	APP/DEPART	1,165	/	1,118	855	/	1,401	3	/	729	1,239	/	14	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	3	127	121	114	136	0	9	3	1	101	0	87	702	0	1	0	0	1	43	0	0	36
	4:15 PM	0	144	128	103	128	6	2	2	0	91	0	76	680	0	0	0	0	0	25	1	0	32
	4:30 PM	2	112	130	141	182	3	5	0	1	107	1	112	796	0	0	0	0	0	34	2	0	61
	4:45 PM	3	142	138	101	148	8	10	1	7	90	1	89	738	1	0	0	0	1	40	1	4	27
	5:00 PM	3	119	161	111	190	4	7	2	7	126	2	82	814	1	0	0	1	2	60	1	1	34
	5:15 PM	0	149	166	115	151	2	3	2	4	127	0	46	765	0	0	0	0	0	35	0	4	23
	5:30 PM	0	105	152	118	165	1	9	3	3	123	4	77	760	0	0	0	0	0	32	1	3	35
	5:45 PM	4	154	177	103	147	5	5	1	1	49	0	80	726	0	0	0	0	0	26	0	1	44
	VOLUMES	15	1,052	1,173	906	1,247	29	50	14	24	814	8	649	5,981	2	1	0	1	4	295	6	13	292
	APPROACH %	1%	47%	52%	42%	57%	1%	57%	16%	27%	55%	1%	44%										
	APP/DEPART	2,240	/	1,752	2,182	/	2,086	88	/	2,093	1,471	/	50	0									
	BEGIN PEAK HR		4:30 PM																				
	VOLUMES	8	522	595	468	671	17	25	5	19	450	4	329	3,113						169	4	9	145
	APPROACH %	1%	46%	53%	40%	58%	1%	51%	10%	39%	57%	1%	42%										
	PEAK HR FACTOR		0.893			0.887			0.681			0.890		0.956									
	APP/DEPART	1,125	/	876	1,156	/	1,141	49	/	1,069	783	/	27	0									

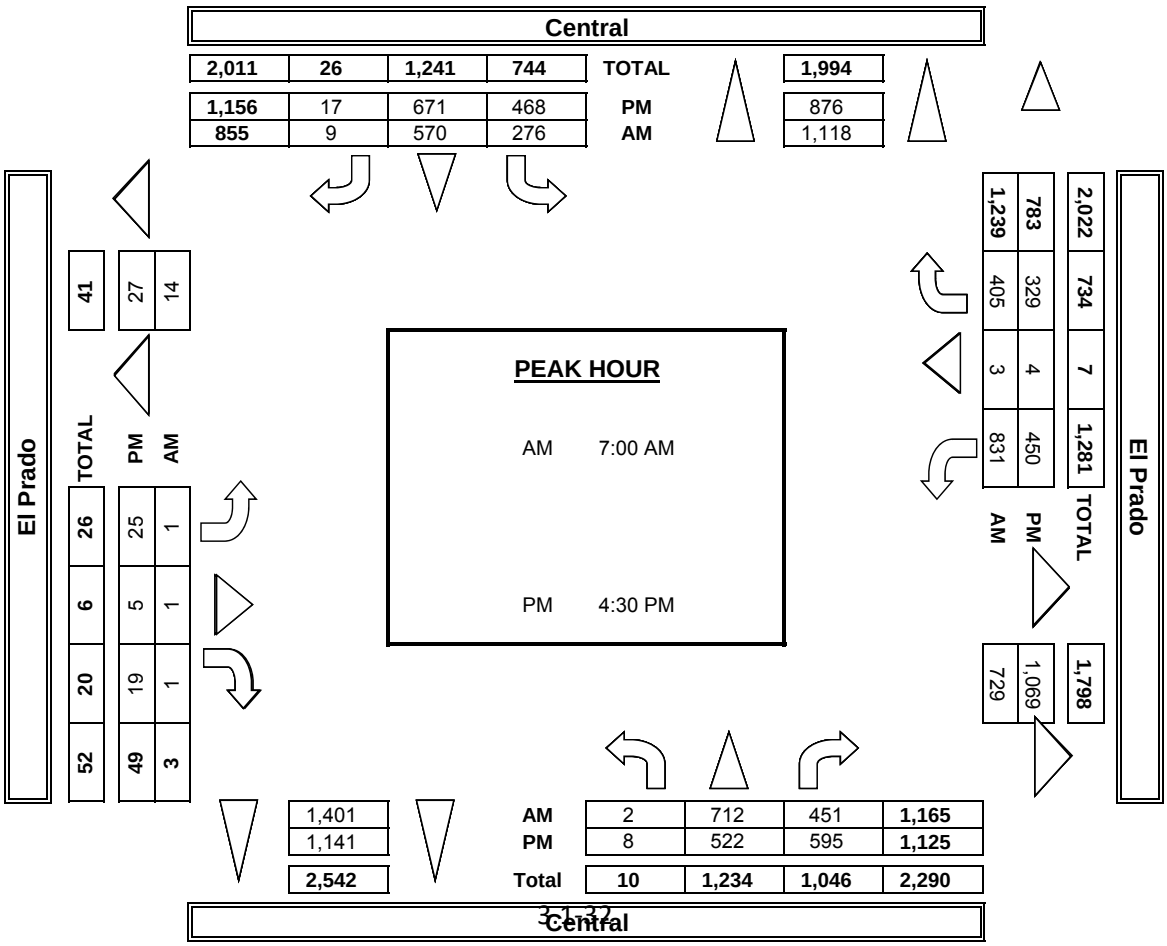


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	3	1	0	0	4	2	1	0	0	3	1	0	0	0	1
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:15 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	4:30 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	1	1	0	0	2	1	0	0	0	1	0	1	0	0	1
	5:30 PM	3	0	0	1	4	0	0	0	0	0	3	0	0	1	4
	5:45 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	TOTAL	7	2	0	1	10	2	1	0	0	3	5	1	0	1	7

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	7
WEDNESDAY	EAST & WEST:	El Prado	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

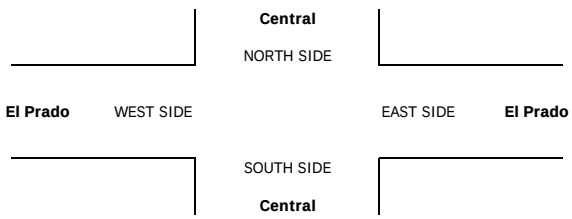
	NORTHBOUND Central			SOUTHBOUND Central			EASTBOUND El Prado			WESTBOUND El Prado			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 3	SR 0	EL 1	ET 1	ER 0	WL 1.5	WT 0.5	WR 1	TOTAL
7:00 AM	0	2	3	2	8	0	0	0	0	10	0	5	30
7:15 AM	0	5	3	2	7	0	0	0	0	4	0	3	24
7:30 AM	0	3	3	1	8	0	0	0	0	4	0	2	21
7:45 AM	0	3	1	3	11	0	0	0	0	4	0	3	25
8:00 AM	0	5	2	4	15	0	0	0	0	4	0	3	33
8:15 AM	0	4	1	4	6	0	0	0	0	4	0	1	20
8:30 AM	0	5	2	3	11	0	0	0	0	5	0	6	32
8:45 AM	0	6	0	8	6	0	0	0	0	3	0	2	25
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	33	15	27	72	0	0	0	0	38	0	25	210
APPROACH %	0%	69%	31%	27%	73%	0%	0%	0%	0%	60%	0%	40%	
APP/DEPART	48	/	58	99	/	110	0	/	42	63	/	0	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	0	17	6	14	43	0	0	0	0	17	0	13	110
APPROACH %	0%	74%	26%	25%	75%	0%	0%	0%	0%	57%	0%	43%	
PEAK HR FACTOR		0.821			0.750			0.000			0.682		0.833
APP/DEPART	23	/	30	57	/	60	0	/	20	30	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	7	3	3	2	0	0	0	0	6	0	1	22
4:15 PM	0	9	1	7	1	0	0	0	0	3	0	2	23
4:30 PM	0	3	3	1	0	0	0	0	0	0	0	1	8
4:45 PM	1	8	1	3	6	0	0	0	1	2	0	3	25
5:00 PM	0	4	2	1	6	0	0	1	0	0	0	2	16
5:15 PM	0	5	1	2	5	0	0	0	0	0	0	1	14
5:30 PM	0	4	0	2	2	0	0	0	0	3	0	0	11
5:45 PM	0	6	2	0	0	0	1	0	0	0	0	2	11
VOLUMES	1	46	13	19	22	0	1	1	1	14	0	12	130
APPROACH %	2%	77%	22%	46%	54%	0%	33%	33%	33%	54%	0%	46%	
APP/DEPART	60	/	59	41	/	37	3	/	33	26	/	1	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	27	8	14	9	0	0	0	1	11	0	7	78
APPROACH %	3%	75%	22%	61%	39%	0%	0%	0%	100%	61%	0%	39%	
PEAK HR FACTOR		0.900			0.639			0.250			0.643		0.780
APP/DEPART	36	/	34	23	/	21	1	/	22	18	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
1	0	0	4
2	0	0	1
0	0	0	1
1	0	0	0
0	0	0	2
1	0	0	0
1	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
6	0	0	9
2	0	0	3
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	2
4	0	1	4
2	0	1	1



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	7
WEDNESDAY	EAST & WEST:	El Prado	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Central)			SOUTHBOUND (Central)			EASTBOUND (El Prado)			WESTBOUND (El Prado)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 3	SR 0	EL 1	ET 1	ER 0	WL 1.5	WT 0.5	WR 1	TOTAL
AM	7:00 AM	0	0	0	0	1	0	0	0	0	2	0	0	3
	7:15 AM	0	0	0	1	0	0	0	0	0	1	0	0	2
	7:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
	8:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	2
	8:30 AM	0	1	0	1	2	0	0	0	0	2	0	1	7
	8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	3	1	3	5	0	0	0	0	5	0	1	18
	APPROACH %	0%	75%	25%	38%	63%	0%	0%	0%	0%	83%	0%	17%	
	APP/DEPART	4	/	4	8	/	10	0	/	4	6	/	0	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	3	1	2	3	0	0	0	0	2	0	1	12
	APPROACH %	0%	75%	25%	40%	60%	0%	0%	0%	0%	67%	0%	33%	
	PEAK HR FACTOR		0.500			0.417			0.000			0.250		0.429
	APP/DEPART	4	/	4	5	/	5	0	/	3	3	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	2	0	0	1	0	0	0	0	0	0	0	3
	4:30 PM	0	2	0	1	0	0	0	0	0	0	0	0	3
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	1	2	1	0	0	0	0	0	2	0	0	6
	5:15 PM	0	1	1	1	0	0	0	0	0	3	0	0	6
	5:30 PM	0	0	0	0	2	0	0	0	0	2	0	0	4
	5:45 PM	0	2	1	0	0	0	0	0	0	0	0	0	3
	VOLUMES	0	8	4	3	3	0	0	0	0	7	0	0	25
	APPROACH %	0%	67%	33%	50%	50%	0%	0%	0%	0%	100%	0%	0%	
	APP/DEPART	12	/	8	6	/	10	0	/	7	7	/	0	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	0	4	4	2	2	0	0	0	0	7	0	0	19
	APPROACH %	0%	50%	50%	50%	50%	0%	0%	0%	0%	100%	0%	0%	
	PEAK HR FACTOR		0.667			0.500			0.000			0.583		0.792
	APP/DEPART	8	/	4	4	/	9	0	/	6	7	/	0	0

U-TURNS

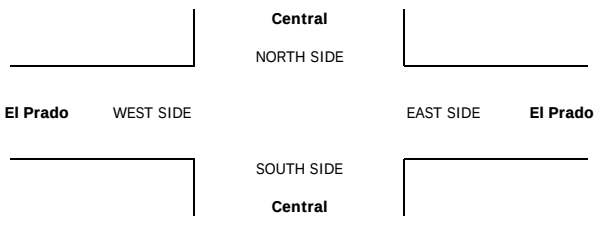
NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0

1	0	0	0

1	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	7
WEDNESDAY	EAST & WEST:	El Prado	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND (Central)			SOUTHBOUND (Central)			EASTBOUND (El Prado)			WESTBOUND (El Prado)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 3	SR 0	EL 1	ET 1	ER 0	WL 1.5	WT 0.5	WR 1	TOTAL
AM	7:00 AM	0	1	7	2	0	0	0	0	0	3	0	0	13
	7:15 AM	0	2	2	4	2	0	0	0	0	5	0	0	15
	7:30 AM	0	1	6	1	0	0	0	0	0	7	0	1	16
	7:45 AM	0	0	7	5	2	0	0	0	0	4	0	3	21
	8:00 AM	0	0	7	4	0	0	0	0	0	7	0	3	21
	8:15 AM	0	3	7	0	1	0	0	0	0	9	0	1	21
	8:30 AM	0	4	8	2	1	0	0	0	0	4	0	4	23
	8:45 AM	0	0	7	5	1	0	0	0	0	4	0	3	20
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	11	51	23	7	0	0	0	0	43	0	15	150
	APPROACH %	0%	18%	82%	77%	23%	0%	0%	0%	0%	74%	0%	26%	
	APP/DEPART	62	/	26	30	/	50	0	/	74	58	/	0	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	0	7	29	11	4	0	0	0	0	24	0	11	86
	APPROACH %	0%	19%	81%	73%	27%	0%	0%	0%	0%	69%	0%	31%	
	PEAK HR FACTOR		0.750			0.536			0.000			0.875		0.935
	APP/DEPART	36	/	18	15	/	28	0	/	40	35	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	2	8	5	2	0	0	0	0	6	0	2	25
	4:15 PM	0	0	8	2	0	0	0	0	0	10	0	3	23
	4:30 PM	0	3	7	2	0	0	0	0	0	7	0	3	22
	4:45 PM	0	0	10	1	0	0	0	0	0	6	0	1	18
	5:00 PM	0	0	5	2	0	0	0	0	0	7	0	1	15
	5:15 PM	0	0	2	1	0	0	0	0	0	1	0	1	5
	5:30 PM	0	0	3	3	0	0	0	0	0	1	0	0	7
	5:45 PM	0	2	1	0	3	0	0	0	0	4	0	0	10
	VOLUMES	0	7	44	16	5	0	0	0	0	42	0	11	125
	APPROACH %	0%	14%	86%	76%	24%	0%	0%	0%	0%	79%	0%	21%	
	APP/DEPART	51	/	18	21	/	47	0	/	60	53	/	0	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	5	33	10	2	0	0	0	0	29	0	9	88
	APPROACH %	0%	13%	87%	83%	17%	0%	0%	0%	0%	76%	0%	24%	
	PEAK HR FACTOR		0.950			0.429			0.000			0.731		0.880
	APP/DEPART	38	/	14	12	/	31	0	/	43	38	/	0	0

U-TURNS					
	NB	SB	EB	WB	TTL
AM	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
PM	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0

RTOR			
NRR 0	SRR 0	ERR 0	WRR 0
1	0	0	0
2	0	0	0
0	0	0	0
1	0	0	2
1	0	0	0
3	0	0	0
1	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
9	0	0	3
6	0	0	2
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
2	0	0	0
4	0	0	1
3	0	0	0
0	0	0	1
1	0	0	0
1	0	0	0
1	0	0	0
13	0	0	2
10	0	0	1

Central (NORTH SIDE)

El Prado WEST SIDE — EAST SIDE **El Prado**

SOUTH SIDE **Central**

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

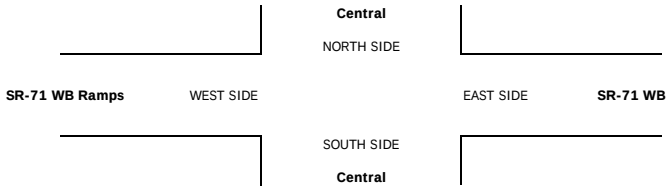
DATE:	LOCATION:	Chino	PROJECT #:	SC0952
Wed, May 18, 16	NORTH & SOUTH:	Central	LOCATION #:	8
	EAST & WEST:	SR-71 WB Ramps	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

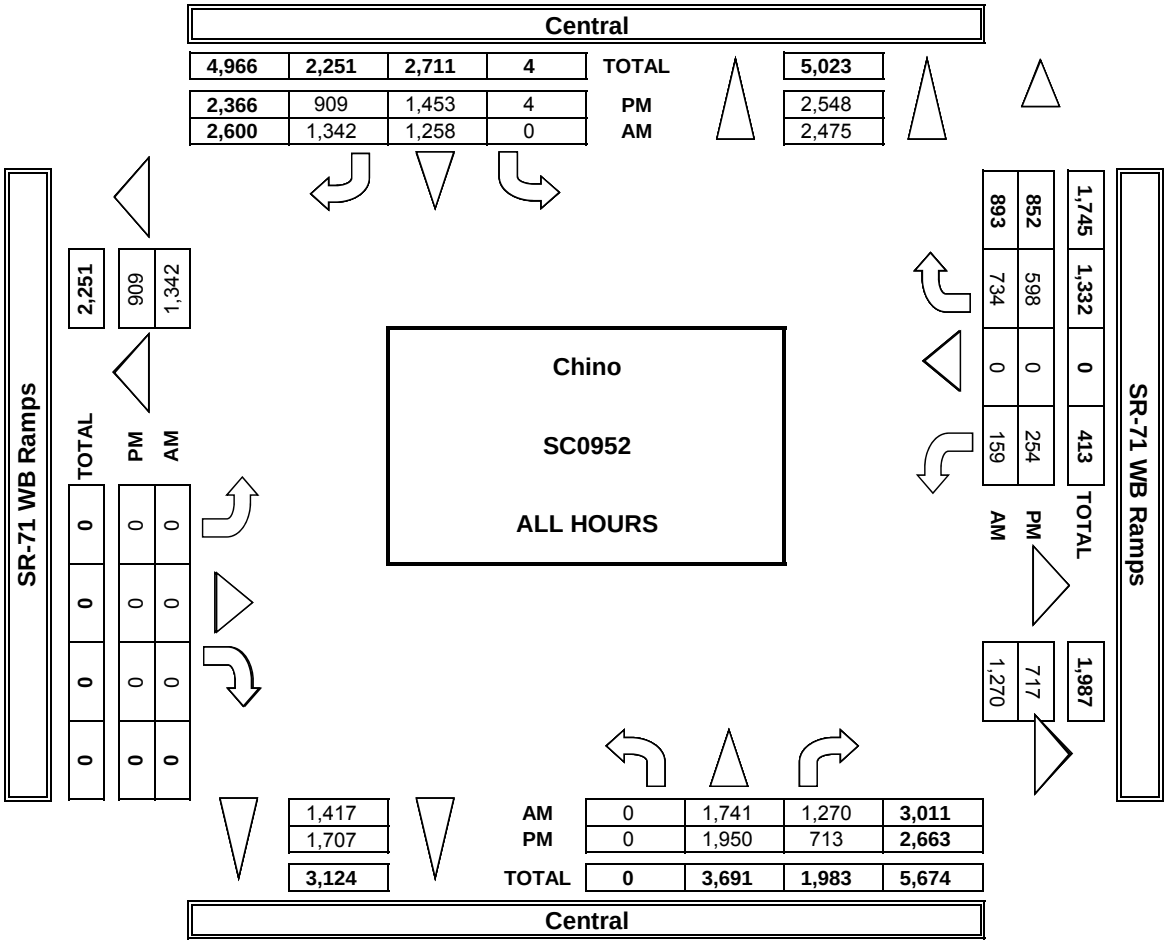
		NORTHBOUND (Central)			SOUTHBOUND (Central)			EASTBOUND (SR-71 WB Ramps)			WESTBOUND (SR-71 WB Ramps)				U-TURNS					RTOR			
	LANES:	NL X	NT 3	NR 2	SL X	ST 3	SR 1	EL X	ET X	ER X	WL 1.5	WT X	WR 0.5	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	208	205	0	308	146	0	0	0	31	0	57	955	0	0	0	0	0	0	0	0	37
	7:15 AM	0	302	245	0	218	206	0	0	0	20	0	90	1,081	0	0	0	0	0	0	0	0	39
	7:30 AM	0	200	138	0	109	212	0	0	0	19	0	105	783	0	0	0	0	0	0	0	0	43
	7:45 AM	0	207	162	0	131	162	0	0	0	18	0	97	777	0	0	0	0	0	0	0	0	41
	8:00 AM	0	226	121	0	124	173	0	0	0	17	0	97	758	0	0	0	0	0	0	0	0	34
	8:15 AM	0	215	141	0	147	146	0	0	0	26	0	102	777	0	0	0	0	0	0	0	0	29
	8:30 AM	0	198	140	0	118	147	0	0	0	12	0	105	720	0	0	0	0	0	0	0	0	42
	8:45 AM	0	185	118	0	103	150	0	0	0	16	0	81	653	0	0	0	0	0	0	0	0	34
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	1,741	1,270	0	1,258	1,342	0	0	0	159	0	734	6,504	0	0	0	0	0	0	0	0	299
	APPROACH %	0%	58%	42%	0%	48%	52%	0%	0%	0%	18%	0%	82%										
	APP/DEPART	3,011	/	2,475	2,600	/	1,417	0	/	1,270	893	/	1,342	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	0	917	750	0	766	726	0	0	0	88	0	349	3,596						0	0	0	160
	APPROACH %	0%	55%	45%	0%	51%	49%	0%	0%	0%	20%	0%	80%										
	PEAK HR FACTOR		0.762			0.822			0.000			0.881		0.832									
	APP/DEPART	1,667	/	1,266	1,492	/	854	0	/	750	437	/	726	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	231	90	0	167	102	0	0	0	26	0	68	684	0	0	0	0	0	0	0	0	33
	4:15 PM	0	203	80	0	151	97	0	0	0	23	0	75	629	0	0	0	0	0	0	0	0	31
	4:30 PM	0	218	92	0	158	117	0	0	0	34	0	76	695	0	0	0	0	0	0	0	0	30
	4:45 PM	0	263	88	0	158	98	0	0	0	26	0	73	706	0	0	0	0	0	0	0	0	35
	5:00 PM	0	241	82	0	252	149	0	0	0	33	0	81	838	0	0	0	0	0	0	0	0	45
	5:15 PM	0	264	94	0	204	121	0	0	0	37	0	69	789	0	0	0	0	0	0	0	0	36
	5:30 PM	0	264	79	4	204	120	0	0	0	31	0	75	777	0	0	0	0	0	0	0	0	38
	5:45 PM	0	266	108	0	159	105	0	0	0	44	0	81	763	0	0	0	0	0	0	0	0	34
	VOLUMES	0	1,950	713	4	1,453	909	0	0	0	254	0	598	5,881	0	0	0	0	0	0	0	0	282
	APPROACH %	0%	73%	27%	0%	61%	38%	0%	0%	0%	30%	0%	70%										
	APP/DEPART	2,663	/	2,548	2,366	/	1,707	0	/	717	852	/	909	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	0	1,035	363	4	819	495	0	0	0	145	0	306	3,167						0	0	0	153
	APPROACH %	0%	74%	26%	0%	62%	38%	0%	0%	0%	32%	0%	68%										
	PEAK HR FACTOR		0.934			0.822			0.000			0.902		0.945									
	APP/DEPART	1,398	/	1,341	1,318	/	964	0	/	367	451	/	495	0									

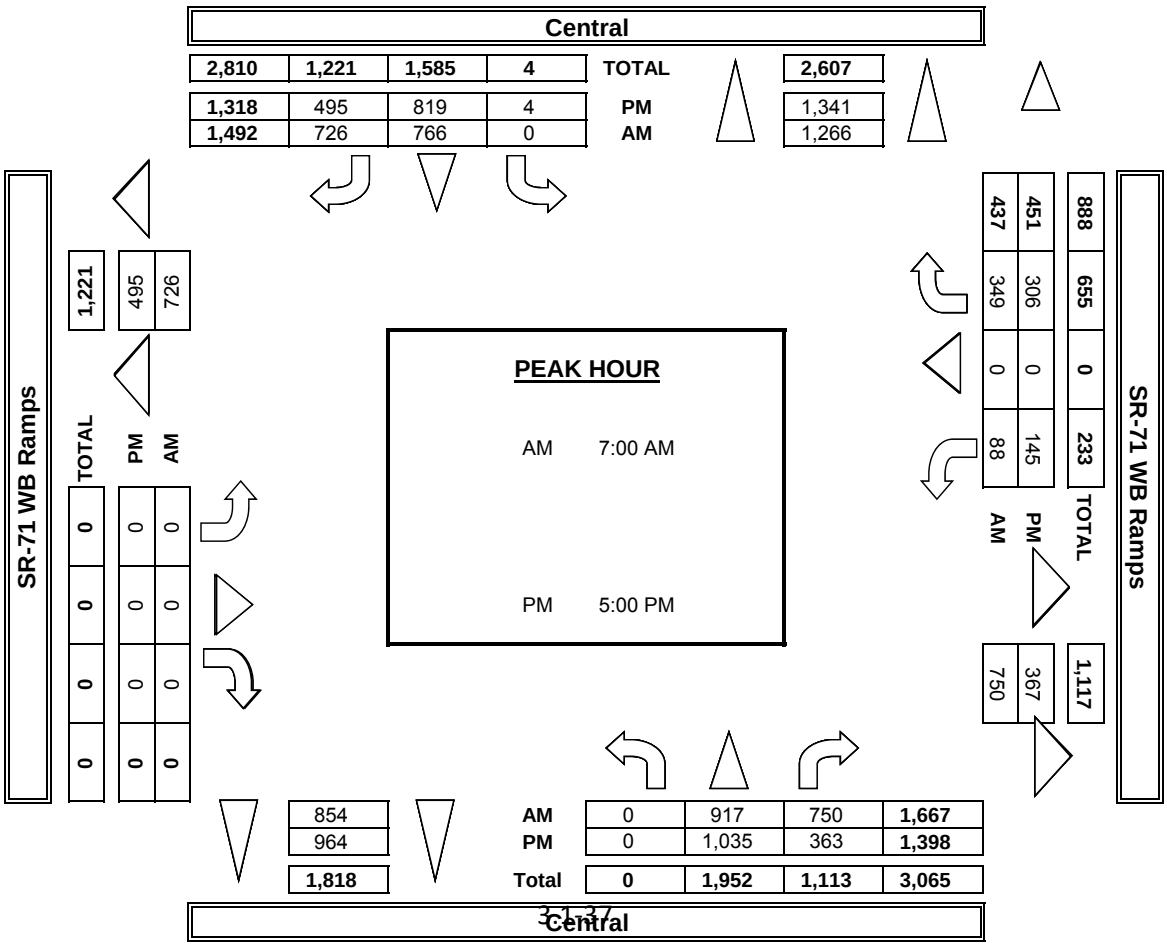


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	3	2	0	0	5	0	0	0	0	0	3	2	0	0	5
	7:15 AM	2	0	0	0	2	0	0	0	0	0	2	0	0	0	2
	7:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	7:45 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	8:00 AM	0	3	0	0	3	0	2	0	0	2	0	1	0	0	1
	8:15 AM	3	0	0	0	3	2	0	0	0	2	1	0	0	0	1
	8:30 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	8:45 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	10	7	0	0	17	3	3	0	0	6	7	4	0	0	11
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	2	1	0	0	3	0	1	0	0	1	2	0	0	0	2
	4:15 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	4:30 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	5:30 PM	2	1	0	0	3	0	1	0	0	1	2	0	0	0	2
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	6	3	0	0	9	1	2	0	0	3	5	1	0	0	6

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	8
WEDNESDAY	EAST & WEST:	SR-71 WB Ramps	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

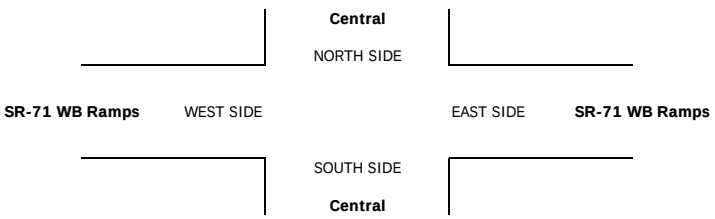
		NORTHBOUND (Central)			SOUTHBOUND (Central)			EASTBOUND (SR-71 WB Ramps)			WESTBOUND (SR-71 WB Ramps)			
	LANES:	NL X	NT 3	NR 2	SL X	ST 3	SR 1	EL X	ET X	ER X	WL 1.5	WT X	WR 0.5	TOTAL
AM	7:00 AM	0	1	1	0	4	9	0	0	0	1	0	6	22
	7:15 AM	0	2	2	0	10	9	0	0	0	2	0	6	31
	7:30 AM	0	6	4	0	2	9	0	0	0	3	0	7	31
	7:45 AM	0	2	2	0	4	6	0	0	0	3	0	3	20
	8:00 AM	0	4	3	0	7	5	0	0	0	3	0	1	23
	8:15 AM	0	0	3	0	9	11	0	0	0	1	0	3	27
	8:30 AM	0	3	3	0	14	12	0	0	0	1	0	5	38
	8:45 AM	0	4	0	0	8	7	0	0	0	1	0	6	26
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	22	18	0	58	68	0	0	0	15	0	37	218
	APPROACH %	0%	55%	45%	0%	46%	54%	0%	0%	0%	29%	0%	71%	
	APP/DEPART	40	/	59	126	/	73	0	/	18	52	/	68	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	11	9	0	38	35	0	0	0	6	0	15	114
	APPROACH %	0%	55%	45%	0%	52%	48%	0%	0%	0%	29%	0%	71%	
	PEAK HR FACTOR		0.714			0.702			0.000			0.750		0.750
	APP/DEPART	20	/	26	73	/	44	0	/	9	21	/	35	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	5	3	0	4	5	0	0	0	3	0	5	25
	4:15 PM	0	6	0	0	1	6	0	0	0	1	0	15	29
	4:30 PM	0	4	1	0	1	3	0	0	0	0	0	5	14
	4:45 PM	0	3	2	0	5	6	0	0	0	1	0	5	22
	5:00 PM	0	2	2	0	6	4	0	0	0	1	0	6	21
	5:15 PM	0	1	0	0	1	1	0	0	0	1	0	5	9
	5:30 PM	0	1	1	0	2	4	0	0	0	2	0	0	10
	5:45 PM	0	7	1	0	2	3	0	0	0	1	0	3	17
	VOLUMES	0	29	10	0	22	32	0	0	0	10	0	44	147
	APPROACH %	0%	74%	26%	0%	41%	59%	0%	0%	0%	19%	0%	81%	
	APP/DEPART	39	/	73	54	/	32	0	/	10	54	/	32	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	18	6	0	11	20	0	0	0	5	0	30	90
	APPROACH %	0%	75%	25%	0%	35%	65%	0%	0%	0%	14%	0%	86%	
	PEAK HR FACTOR		0.750			0.705			0.000			0.547		0.776
	APP/DEPART	24	/	48	31	/	16	0	/	6	35	/	20	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	6
0	0	0	1
0	0	0	4
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	2
0	0	0	3
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	17
0	0	0	5
0	0	0	0
0	0	0	0
0	0	0	3
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	2
0	0	0	4
0	0	0	2
0	0	0	3
0	0	0	2
0	0	0	0
0	0	0	0
0	0	0	21
0	0	0	16



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	8
WEDNESDAY	EAST & WEST:	SR-71 WB Ramps	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND Central			SOUTHBOUND Central			EASTBOUND SR-71 WB Ramps			WESTBOUND SR-71 WB Ramps			
	LANES:	NL X	NT 3	NR 2	SL X	ST 3	SR 1	EL X	ET X	ER X	WL 1.5	WT X	WR 0.5	TOTAL
AM	7:00 AM	0	0	0	0	0	1	0	0	0	3	0	0	4
	7:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
	7:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	2
	7:45 AM	0	1	0	0	1	2	0	0	0	0	0	0	4
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
	8:15 AM	0	2	1	0	0	1	0	0	0	0	0	0	4
	8:30 AM	0	2	0	0	3	1	0	0	0	0	0	0	6
	8:45 AM	0	0	0	0	1	1	0	0	0	0	0	1	3
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	5	1	0	6	6	0	0	0	5	0	2	25
	APPROACH %	0%	83%	17%	0%	50%	50%	0%	0%	0%	71%	0%	29%	
	APP/DEPART	6	/	7	12	/	11	0	/	1	7	/	6	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	0	5	1	0	4	4	0	0	0	0	0	1	15
	APPROACH %	0%	83%	17%	0%	50%	50%	0%	0%	0%	0%	0%	100%	
	PEAK HR FACTOR		0.500			0.500			0.000			0.250		0.625
	APP/DEPART	6	/	6	8	/	4	0	/	1	1	/	4	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	2	1	0	0	1	0	0	0	0	0	0	4
	4:15 PM	0	1	0	0	0	3	0	0	0	3	0	1	8
	4:30 PM	0	3	0	0	0	1	0	0	0	0	0	0	4
	4:45 PM	0	2	0	0	0	4	0	0	0	0	0	0	6
	5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
	5:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	2
	5:30 PM	0	1	0	0	0	2	0	0	0	0	0	0	3
	5:45 PM	0	0	1	0	0	2	0	0	0	0	0	1	4
	VOLUMES	0	11	2	0	0	14	0	0	0	3	0	2	32
	APPROACH %	0%	85%	15%	0%	0%	100%	0%	0%	0%	60%	0%	40%	
	APP/DEPART	13	/	13	14	/	3	0	/	2	5	/	14	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	8	1	0	0	9	0	0	0	3	0	1	22
	APPROACH %	0%	89%	11%	0%	0%	100%	0%	0%	0%	75%	0%	25%	
	PEAK HR FACTOR		0.750			0.563			0.000			0.250		0.688
	APP/DEPART	9	/	9	9	/	3	0	/	1	4	/	9	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
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0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
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0	0	0	0
0	0	0	0
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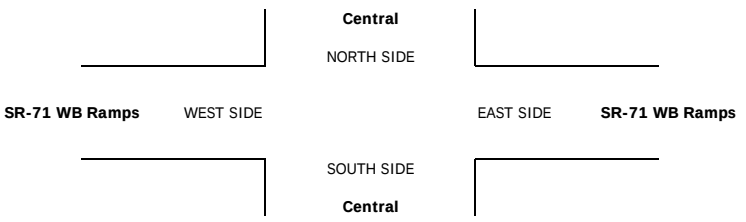
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	8
WEDNESDAY	EAST & WEST:	SR-71 WB Ramps	CONTROL:	SIGNAL

CLASS 4:	NOTES:
4 OR MORE AXLE TRUCKS	

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Central			SOUTHBOUND Central			EASTBOUND SR-71 WB Ramps			WESTBOUND SR-71 WB Ramps			
LANES:	NL X	NT 3	NR 2	SL X	ST 3	SR 1	EL X	ET X	ER X	WL 1.5	WT X	WR 0.5	TOTAL
7:00 AM	0	7	1	0	2	7	0	0	0	0	0	1	18
7:15 AM	0	3	1	0	3	9	0	0	0	0	0	2	18
7:30 AM	0	7	0	0	1	4	0	0	0	0	0	0	12
7:45 AM	0	7	1	0	3	5	0	0	0	1	0	0	17
8:00 AM	0	7	0	0	1	5	0	0	0	2	0	1	16
8:15 AM	0	6	0	0	0	3	0	0	0	0	0	4	13
8:30 AM	0	9	0	0	2	6	0	0	0	0	0	1	18
8:45 AM	0	9	0	0	3	4	0	0	0	1	0	0	17
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	55	3	0	15	43	0	0	0	4	0	9	129
APPROACH %	0%	95%	5%	0%	26%	74%	0%	0%	0%	31%	0%	69%	
APP/DEPART	58	/	64	58	/	19	0	/	3	13	/	43	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	24	3	0	9	25	0	0	0	1	0	3	65
APPROACH %	0%	89%	11%	0%	26%	74%	0%	0%	0%	25%	0%	75%	
PEAK HR FACTOR		0.844			0.708			0.000			0.500		0.903
APP/DEPART	27	/	27	34	/	10	0	/	3	4	/	25	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	10	0	0	1	3	0	0	0	0	0	1	15
4:15 PM	0	6	0	0	1	6	0	0	0	0	0	0	13
4:30 PM	0	7	0	0	1	7	0	0	0	0	0	1	16
4:45 PM	0	8	0	0	0	3	0	0	0	0	0	1	12
5:00 PM	0	4	0	0	0	3	0	0	0	0	0	1	8
5:15 PM	0	4	1	0	0	6	0	0	0	0	0	0	11
5:30 PM	0	4	0	0	1	2	0	0	0	0	0	0	7
5:45 PM	0	1	0	0	3	2	0	0	0	0	0	3	9
VOLUMES	0	44	1	0	7	32	0	0	0	0	0	7	91
APPROACH %	0%	98%	2%	0%	18%	82%	0%	0%	0%	0%	0%	100%	
APP/DEPART	45	/	51	39	/	7	0	/	1	7	/	32	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	31	0	0	3	19	0	0	0	0	0	3	56
APPROACH %	0%	100%	0%	0%	14%	86%	0%	0%	0%	0%	0%	100%	
PEAK HR FACTOR		0.775			0.688			0.000			0.750		0.875
APP/DEPART	31	/	34	22	/	3	0	/	0	3	/	19	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	1
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	4

0	0	0	2

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	3
0	0	0	3

0	0	0	0

Central

NORTH SIDE

SR-71 WB Ramps — WEST SIDE — EAST SIDE — SR-71 WB Ramps

SOUTH SIDE

Central

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: Central
EAST & WEST: SR-71 EB Ramps

PROJECT #: SC0952
LOCATION #: 9
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND Central			SOUTHBOUND Central			EASTBOUND SR-71 EB Ramps			WESTBOUND SR-71 EB Ramps				U-TURNS					RTOR			
	LANES:	NL X	NT 3	NR 1	SL X	ST 3	SR 2	EL 1.5	ET X	ER 0.5	WL X	WT X	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	346	9	0	273	49	70	0	109	0	0	0	856	0	0	0	0	0	0	0	30	0
	7:15 AM	0	451	29	0	216	43	92	0	103	0	0	0	934	0	0	0	0	0	0	0	32	0
	7:30 AM	0	265	11	0	107	42	76	0	57	0	0	0	558	0	0	0	0	0	0	0	27	0
	7:45 AM	0	231	13	0	118	35	130	0	61	0	0	0	588	0	0	0	0	0	0	0	22	0
	8:00 AM	0	241	23	0	92	51	109	0	54	0	0	0	570	0	0	0	0	0	0	0	19	0
	8:15 AM	0	238	22	0	96	59	124	0	74	0	0	0	613	0	0	0	0	0	0	0	22	0
	8:30 AM	0	235	22	0	83	52	107	0	69	0	0	0	568	0	0	0	0	0	0	0	30	0
	8:45 AM	0	219	21	0	70	44	100	0	59	0	0	0	513	0	0	0	0	0	0	0	19	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	2,226	150	0	1,055	375	808	0	586	0	0	0	5,200	0	0	0	0	0	0	0	201	0
	APPROACH %	0%	94%	6%	0%	74%	26%	58%	0%	42%	0%	0%	0%										
	APP/DEPART	2,376	/	3,034	1,430	/	1,641	1,394	/	150	0	/	375	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	0	1,293	62	0	714	169	368	0	330	0	0	0	2,936						0	0	111	0
	APPROACH %	0%	95%	5%	0%	81%	19%	53%	0%	47%	0%	0%	0%										
	PEAK HR FACTOR		0.706			0.686			0.895			0.000		0.786									
	APP/DEPART	1,355	/	1,661	883	/	1,044	698	/	62	0	/	169	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	180	21	0	111	83	143	0	122	0	0	0	660	0	0	0	0	0	0	0	27	0
	4:15 PM	0	156	24	0	109	66	132	0	162	0	0	0	649	0	0	0	0	0	0	0	40	0
	4:30 PM	0	169	21	0	120	72	145	0	147	0	0	0	674	0	0	0	0	0	0	0	26	0
	4:45 PM	0	200	23	0	111	76	155	0	147	0	0	0	712	0	0	0	0	0	0	0	37	0
	5:00 PM	0	146	18	0	180	108	176	0	171	0	0	0	799	0	0	0	0	0	0	0	23	0
	5:15 PM	0	176	20	0	163	77	182	0	192	0	0	0	810	0	0	0	0	0	0	0	40	0
	5:30 PM	0	151	28	0	159	76	191	0	188	0	0	0	793	0	0	0	0	0	0	0	22	0
	5:45 PM	0	192	17	0	142	64	187	0	194	0	0	0	796	0	0	0	0	0	0	0	40	0
	VOLUMES	0	1,370	172	0	1,095	622	1,311	0	1,323	0	0	0	5,893	0	0	0	0	0	0	0	255	0
	APPROACH %	0%	89%	11%	0%	64%	36%	50%	0%	50%	0%	0%	0%										
	APP/DEPART	1,542	/	2,681	1,717	/	2,418	2,634	/	172	0	/	622	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	0	665	83	0	644	325	736	0	745	0	0	0	3,198						0	0	125	0
	APPROACH %	0%	89%	11%	0%	66%	34%	50%	0%	50%	0%	0%	0%										
	PEAK HR FACTOR		0.895			0.841			0.972			0.000		0.987									
	APP/DEPART	748	/	1,401	969	/	1,389	1,481	/	83	0	/	325	0									

Central

NORTH SIDE

SR-71 EB Ramps WEST SIDE EAST SIDE **SR-71 EB Ramps**

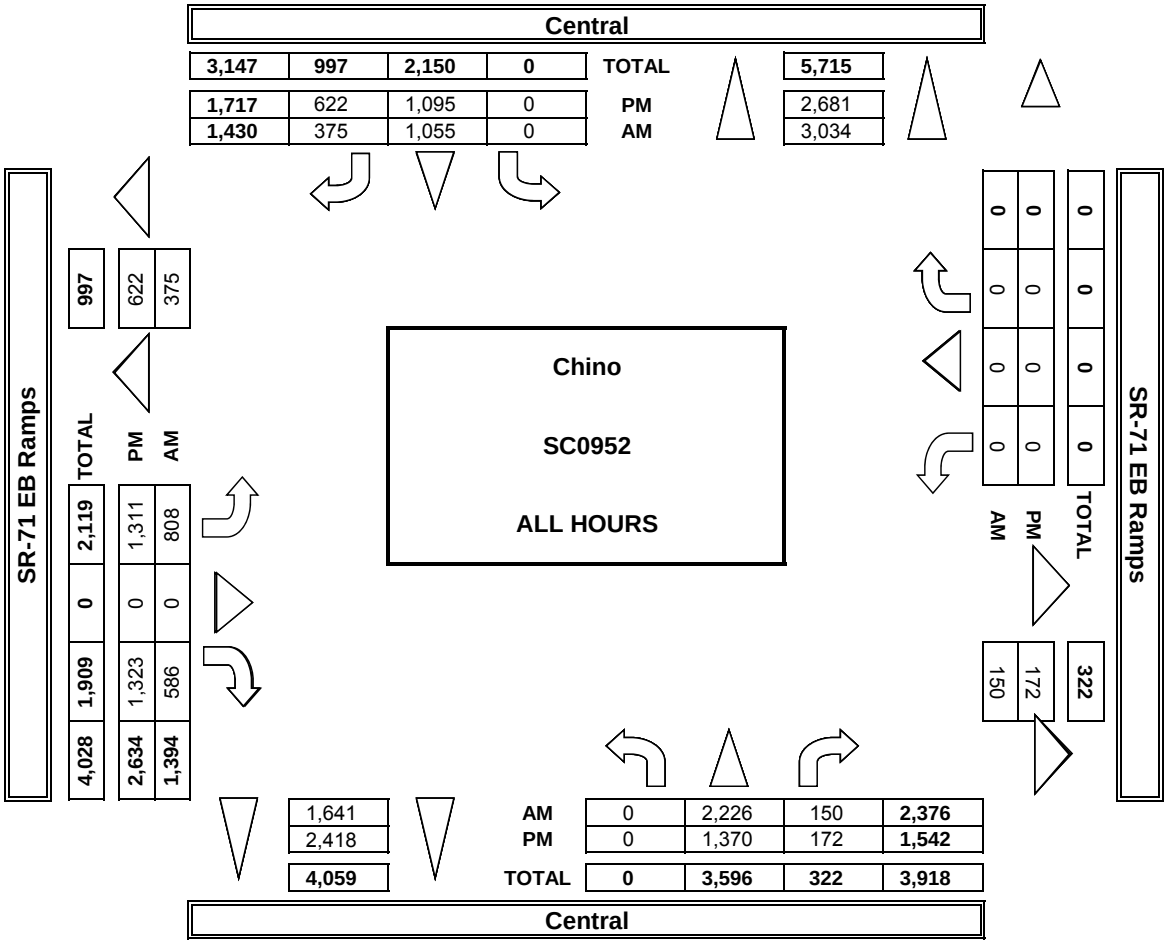
SOUTH SIDE

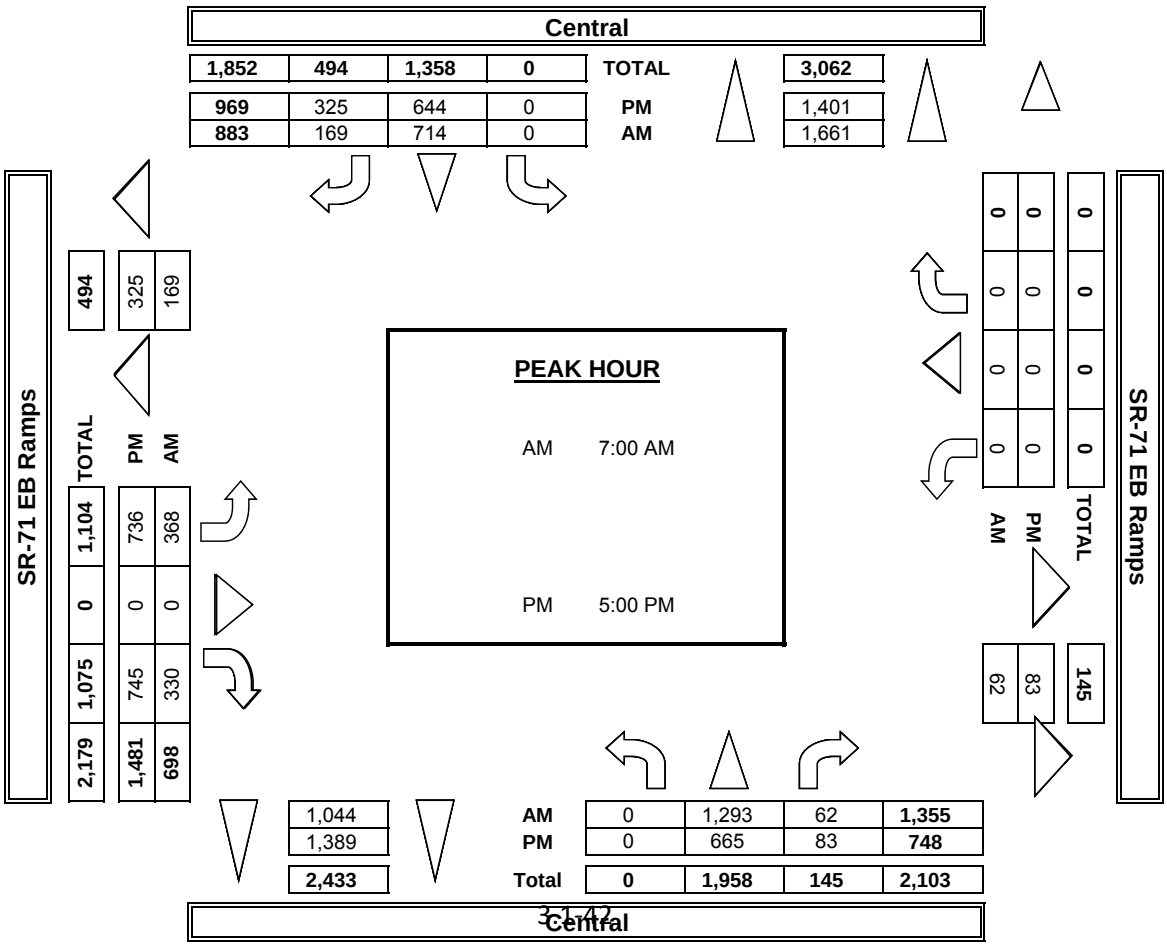
Central

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:15 AM	4	0	0	0	4	0	0	0	0	0	4	0	0	0	4
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	2	0	0	0	2	1	0	0	0	1	1	0	0	0	1
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	3	0	0	0	3	2	0	0	0	2	1	0	0	0	1
	8:30 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	8:45 AM	1	1	0	0	2	0	1	0	0	1	1	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	12	1	0	0	13	4	1	0	0	5	8	0	0	0	8
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	2	0	0	0	2	0	0	0	0	0	2	0	0	0	2
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	2	0	0	0	2	1	0	0	0	1	1	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	1	2	0	0	3	1	1	0	0	2	0	1	0	0	1
	5:30 PM	2	1	0	0	3	0	1	0	0	1	2	0	0	0	2
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	7	3	0	0	10	2	2	0	0	4	5	1	0	0	6

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	9
WEDNESDAY	EAST & WEST:	SR-71 EB Ramps	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS	NOTES:	AM / PM / MD / OTHER / OTHER	▲ N / ◄ W / E ► / S ▼

		NORTHBOUND Central			SOUTHBOUND Central			EASTBOUND SR-71 EB Ramps			WESTBOUND SR-71 EB Ramps			
	LANES:	NL X	NT 3	NR 1	SL X	ST 3	SR 2	EL 1.5	ET X	ER 0.5	WL X	WT X	WR X	TOTAL
AM	7:00 AM	0	1	1	0	2	7	3	0	0	0	0	0	14
	7:15 AM	0	3	0	0	4	6	3	0	0	0	0	0	16
	7:30 AM	0	1	0	0	1	4	4	0	3	0	0	0	13
	7:45 AM	0	3	0	0	0	7	2	0	5	0	0	0	17
	8:00 AM	0	2	0	0	2	8	7	0	2	0	0	0	21
	8:15 AM	0	2	0	0	5	6	1	0	3	0	0	0	17
	8:30 AM	0	1	0	0	6	5	3	0	5	0	0	0	20
	8:45 AM	0	2	2	0	4	3	3	0	7	0	0	0	21
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	15	3	0	24	46	26	0	25	0	0	0	139
	APPROACH %	0%	83%	17%	0%	34%	66%	51%	0%	49%	0%	0%	0%	
	APP/DEPART	18	/	41	70	/	49	51	/	3	0	/	46	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	7	2	0	17	22	14	0	17	0	0	0	79
	APPROACH %	0%	78%	22%	0%	44%	56%	45%	0%	55%	0%	0%	0%	
	PEAK HR FACTOR		0.563			0.886			0.775			0.000		0.940
	APP/DEPART	9	/	21	39	/	34	31	/	2	0	/	22	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	2	0	0	4	3	3	0	3	0	0	0	15
	4:15 PM	0	0	1	0	1	1	5	0	1	0	0	0	9
	4:30 PM	0	1	0	0	2	0	3	0	1	0	0	0	7
	4:45 PM	0	3	0	0	5	2	2	0	3	0	0	0	15
	5:00 PM	0	1	1	0	4	4	3	0	1	0	0	0	14
	5:15 PM	0	0	0	0	1	1	4	0	1	0	0	0	7
	5:30 PM	0	1	0	0	2	1	3	0	1	0	0	0	8
	5:45 PM	0	3	0	0	2	1	5	0	1	0	0	0	12
	VOLUMES	0	11	2	0	21	13	28	0	12	0	0	0	87
	APPROACH %	0%	85%	15%	0%	62%	38%	70%	0%	30%	0%	0%	0%	
	APP/DEPART	13	/	39	34	/	33	40	/	2	0	/	13	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	6	1	0	12	6	13	0	8	0	0	0	46
	APPROACH %	0%	86%	14%	0%	67%	33%	62%	0%	38%	0%	0%	0%	
	PEAK HR FACTOR		0.583			0.643			0.875			0.000		0.767
	APP/DEPART	7	/	19	18	/	20	21	/	1	0	/	6	0

U-TURNS					
NB	SB	EB	WB	TTL	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	9
WEDNESDAY	EAST & WEST:	SR-71 EB Ramps	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Central)			SOUTHBOUND (Central)			EASTBOUND (SR-71 EB Ramps)			WESTBOUND (SR-71 EB Ramps)			
	LANES:	NL X	NT 3	NR 1	SL X	ST 3	SR 2	EL 1.5	ET X	ER 0.5	WL X	WT X	WR X	TOTAL
AM	7:00 AM	0	0	0	0	3	0	0	0	0	0	0	0	3
	7:15 AM	0	0	0	0	1	0	1	0	0	0	0	0	2
	7:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	1
	7:45 AM	0	0	0	0	0	1	1	0	0	0	0	0	2
	8:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
	8:15 AM	0	2	0	0	0	1	0	0	1	0	0	0	4
	8:30 AM	0	0	0	0	3	0	3	0	0	0	0	0	6
	8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	2	0	0	8	3	5	0	2	0	0	0	20
	APPROACH %	0%	100%	0%	0%	73%	27%	71%	0%	29%	0%	0%	0%	
	APP/DEPART	2	/	7	11	/	10	7	/	0	0	/	3	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	0	2	0	0	3	3	4	0	1	0	0	0	13
	APPROACH %	0%	100%	0%	0%	50%	50%	80%	0%	20%	0%	0%	0%	
	PEAK HR FACTOR		0.250			0.500			0.417			0.000		0.542
	APP/DEPART	2	/	6	6	/	4	5	/	0	0	/	3	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	2	0	0	0	0	1	0	0	0	0	0	3
	4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
	4:30 PM	0	0	0	0	0	1	3	0	0	0	0	0	4
	4:45 PM	0	2	1	0	0	0	0	0	0	0	0	0	3
	5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
	5:15 PM	0	1	0	0	0	0	0	0	1	0	0	0	2
	5:30 PM	0	1	1	0	0	0	0	0	0	0	0	0	2
	5:45 PM	0	0	0	0	0	2	1	0	0	0	0	0	3
	VOLUMES	0	8	2	0	0	3	5	0	1	0	0	0	19
	APPROACH %	0%	80%	20%	0%	0%	100%	83%	0%	17%	0%	0%	0%	
	APP/DEPART	10	/	13	3	/	1	6	/	2	0	/	3	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	5	1	0	0	1	4	0	0	0	0	0	11
	APPROACH %	0%	83%	17%	0%	0%	100%	100%	0%	0%	0%	0%	0%	
	PEAK HR FACTOR		0.500			0.250			0.333			0.000		0.688
	APP/DEPART	6	/	9	1	/	0	4	/	1	0	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
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0	0	0	0
0	0	0	0
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0	0	0	0
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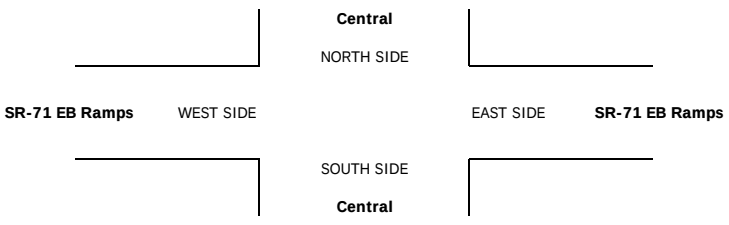
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Central	LOCATION #:	9
WEDNESDAY	EAST & WEST:	SR-71 EB Ramps	CONTROL:	SIGNAL

CLASS 4:	NOTES:
4 OR MORE AXLE TRUCKS	

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND (Central)			SOUTHBOUND (Central)			EASTBOUND (SR-71 EB Ramps)			WESTBOUND (SR-71 EB Ramps)			
LANES:	NL X	NT 3	NR 1	SL X	ST 3	SR 2	EL 1.5	ET X	ER 0.5	WL X	WT X	WR X	TOTAL
7:00 AM	0	1	0	0	0	2	7	0	0	0	0	0	10
7:15 AM	0	2	3	0	0	3	2	0	0	0	0	0	10
7:30 AM	0	1	0	0	0	1	6	0	0	0	0	0	8
7:45 AM	0	2	0	0	2	2	6	0	0	0	0	0	12
8:00 AM	0	0	1	0	3	0	7	0	0	0	0	0	11
8:15 AM	0	0	2	0	0	0	6	0	0	0	0	0	8
8:30 AM	0	2	0	0	1	1	7	0	0	0	0	0	11
8:45 AM	0	0	0	0	1	3	9	0	2	0	0	0	15
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	8	6	0	7	12	50	0	2	0	0	0	85
APPROACH %	0%	57%	43%	0%	37%	63%	96%	0%	4%	0%	0%	0%	
APP/DEPART	14	/	58	19	/	9	52	/	6	0	/	12	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	2	3	0	5	4	29	0	2	0	0	0	45
APPROACH %	0%	40%	60%	0%	56%	44%	94%	0%	6%	0%	0%	0%	
PEAK HR FACTOR		0.625			0.563			0.705			0.000		0.750
APP/DEPART	5	/	31	9	/	7	31	/	3	0	/	4	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	1	0	0	0	1	9	0	0	0	0	0	11
4:15 PM	0	0	0	0	1	0	6	0	0	0	0	0	7
4:30 PM	0	1	0	0	0	1	6	0	1	0	0	0	9
4:45 PM	0	0	0	0	0	0	8	0	0	0	0	0	8
5:00 PM	0	0	0	0	0	0	4	0	0	0	0	0	4
5:15 PM	0	2	0	0	0	0	3	0	0	0	0	0	5
5:30 PM	0	1	0	0	1	0	3	0	0	0	0	0	5
5:45 PM	0	0	0	0	1	2	1	0	0	0	0	0	4
VOLUMES	0	5	0	0	3	4	40	0	1	0	0	0	53
APPROACH %	0%	100%	0%	0%	43%	57%	98%	0%	2%	0%	0%	0%	
APP/DEPART	5	/	45	7	/	4	41	/	0	0	/	4	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	2	0	0	1	2	29	0	1	0	0	0	35
APPROACH %	0%	100%	0%	0%	33%	67%	97%	0%	3%	0%	0%	0%	
PEAK HR FACTOR		0.500			0.750			0.833			0.000		0.795
APP/DEPART	2	/	31	3	/	2	30	/	0	0	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: El Prado
EAST & WEST: Kimball

PROJECT #: SC0952
LOCATION #: 10
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND (El Prado)			SOUTHBOUND (El Prado)			EASTBOUND (Kimball)			WESTBOUND (Kimball)				U-TURNS					RTOR			
	LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 0	EL 1	ET 0.5	ER 0.5	WL 0.5	WT 0.5	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	2	77	1	91	49	10	1	0	0	3	7	256	497	0	0	0	0	0	0	0	0	219
	7:15 AM	0	69	1	93	43	10	3	0	0	4	3	271	497	0	0	0	0	0	0	0	0	225
	7:30 AM	1	57	6	107	44	7	3	0	1	3	6	233	468	0	0	0	0	0	0	0	0	202
	7:45 AM	2	46	4	126	41	14	2	1	1	6	9	234	486	0	0	0	0	0	0	0	1	198
	8:00 AM	0	42	3	108	35	7	13	2	1	7	4	197	419	0	0	0	0	0	0	2	0	141
	8:15 AM	0	37	8	108	46	6	7	2	1	5	1	250	471	0	0	0	0	0	0	0	0	219
	8:30 AM	0	36	2	84	45	2	4	2	1	10	0	214	400	0	0	0	0	0	0	0	0	184
	8:45 AM	0	36	2	86	46	7	2	0	0	12	0	170	361	0	0	0	0	0	0	1	0	121
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	5	400	27	803	349	63	35	7	5	50	30	1,825	3,599	0	0	0	0	0	0	3	1	1,509
	APPROACH %	1%	93%	6%	66%	29%	5%	74%	15%	11%	3%	2%	96%										
	APP/DEPART	432	/	2,260	1,215	/	404	47	/	837	1,905	/	98	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	5	249	12	417	177	41	9	1	2	16	25	994	1,948						0	0	1	844
	APPROACH %	2%	94%	5%	66%	28%	6%	75%	8%	17%	2%	2%	96%										
	PEAK HR FACTOR		0.831			0.877			0.750			0.931		0.980									
	APP/DEPART	266	/	1,252	635	/	195	12	/	430	1,035	/	71	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	47	10	166	62	3	19	14	0	3	1	95	421	0	0	0	0	0	3	0	0	74
	4:15 PM	1	29	8	171	62	1	4	6	0	2	1	114	399	0	0	0	0	0	0	0	0	98
	4:30 PM	1	67	6	156	78	2	13	3	3	1	0	125	455	0	0	0	0	0	0	0	0	106
	4:45 PM	2	41	1	167	68	3	3	0	1	10	1	120	417	0	0	0	0	0	0	0	1	99
	5:00 PM	0	43	6	173	89	6	15	4	2	0	1	132	471	0	0	0	0	0	0	0	0	119
	5:15 PM	0	26	8	203	83	2	2	1	2	6	1	116	450	0	0	0	0	0	1	1	1	104
	5:30 PM	0	39	4	201	80	1	8	6	2	0	1	113	455	0	0	0	0	0	0	0	1	103
	5:45 PM	0	33	3	213	63	2	2	1	1	2	0	91	411	0	0	0	0	0	0	0	1	87
	VOLUMES	5	325	46	1,450	585	20	66	35	11	24	6	906	3,479	0	0	0	0	0	4	1	4	790
	APPROACH %	1%	86%	12%	71%	28%	1%	59%	31%	10%	3%	1%	97%										
	APP/DEPART	376	/	1,297	2,055	/	620	112	/	1,531	936	/	31	0									
	BEGIN PEAK HR		4:30 PM																				
	VOLUMES	3	177	21	699	318	13	33	8	8	17	3	493	1,793						1	1	2	428
	APPROACH %	1%	88%	10%	68%	31%	1%	67%	16%	16%	3%	1%	96%										
	PEAK HR FACTOR		0.679			0.894			0.583			0.964		0.952									
	APP/DEPART	201	/	703	1,030	/	343	49	/	728	513	/	19	0									

El Prado

NORTH SIDE

Kimball WEST SIDE EAST SIDE **Kimball**

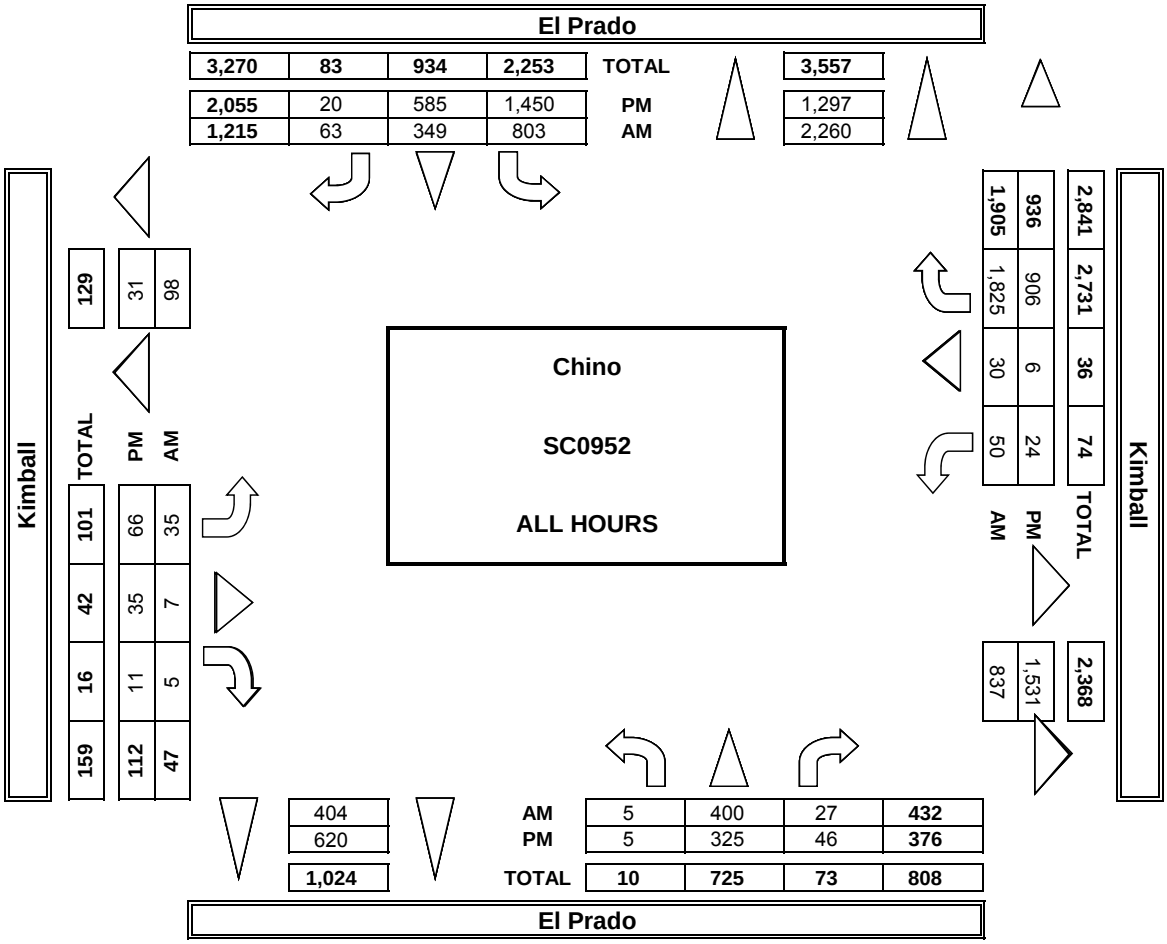
SOUTH SIDE

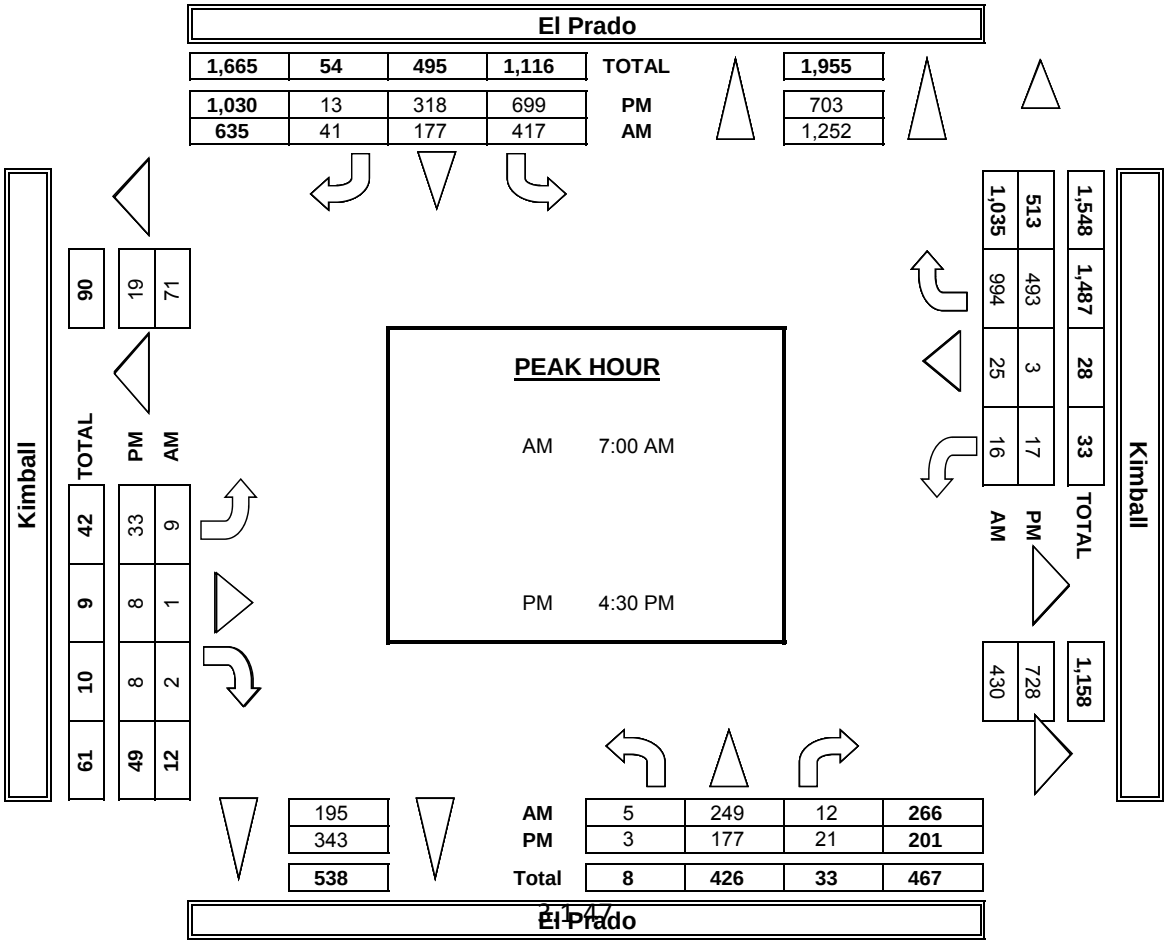
El Prado

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	3	0	0	3	0	3	0	0	3	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	5:45 PM	0	2	2	0	4	0	0	0	0	0	0	2	2	0	4
	TOTAL	0	6	2	1	9	0	3	0	0	3	0	3	2	1	6

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	El Prado	LOCATION #:	10
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND El Prado			SOUTHBOUND El Prado			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 0	EL 1	ET 0.5	ER 0.5	WL 0.5	WT 0.5	WR 1	TOTAL
7:00 AM	0	0	0	5	1	0	0	0	0	0	0	4	10
7:15 AM	0	0	0	4	0	0	0	0	0	0	0	7	11
7:30 AM	0	0	0	3	1	0	0	0	0	0	0	5	9
7:45 AM	0	1	1	4	2	0	0	0	0	1	0	7	16
8:00 AM	0	1	2	5	0	0	0	0	0	0	0	3	11
8:15 AM	0	0	0	6	0	0	0	0	0	0	0	8	14
8:30 AM	0	2	0	2	0	0	0	0	0	1	0	5	10
8:45 AM	0	2	0	4	2	0	0	0	0	1	0	1	10
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	6	3	33	6	0	0	0	0	3	0	40	91
APPROACH %	0%	67%	33%	85%	15%	0%	0%	0%	0%	7%	0%	93%	
APP/DEPART	9	/	46	39	/	9	0	/	36	43	/	0	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	0	4	3	17	2	0	0	0	0	2	0	23	51
APPROACH %	0%	57%	43%	89%	11%	0%	0%	0%	0%	8%	0%	92%	
PEAK HR FACTOR		0.583			0.792			0.000			0.781		0.797
APP/DEPART	7	/	27	19	/	4	0	/	20	25	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	1	0	6	2	0	0	0	0	0	0	1	11
4:15 PM	0	1	0	6	3	0	1	0	0	1	0	4	16
4:30 PM	0	0	0	5	0	0	0	0	0	0	0	1	6
4:45 PM	1	3	0	7	0	0	1	0	0	1	0	2	15
5:00 PM	0	0	0	6	1	0	0	1	0	0	0	2	10
5:15 PM	0	0	0	7	0	0	0	0	0	0	1	3	11
5:30 PM	0	1	0	5	1	0	1	0	0	0	0	3	11
5:45 PM	0	0	0	5	1	0	0	0	0	0	0	2	8
VOLUMES	2	6	0	47	8	0	3	1	0	2	1	18	88
APPROACH %	25%	75%	0%	85%	15%	0%	75%	25%	0%	10%	5%	86%	
APP/DEPART	8	/	27	55	/	10	4	/	48	21	/	3	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	2	5	0	24	5	0	2	0	0	2	0	8	48
APPROACH %	29%	71%	0%	83%	17%	0%	100%	0%	0%	20%	0%	80%	
PEAK HR FACTOR		0.438			0.806			0.500			0.500		0.750
APP/DEPART	7	/	15	29	/	7	2	/	24	10	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	El Prado	LOCATION #:	10
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND El Prado			SOUTHBOUND El Prado			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 0	EL 1	ET 0.5	ER 0.5	WL 0.5	WT 0.5	WR 1	TOTAL
AM 7:00 AM	0	1	1	0	1	0	0	0	0	0	0	2	5
7:15 AM	0	0	0	1	1	0	0	0	0	0	0	2	4
7:30 AM	0	0	0	1	1	0	0	0	0	0	0	2	4
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	2	1	0	0	0	0	0	0	1	4
8:30 AM	0	1	0	3	1	0	0	0	0	0	0	4	9
8:45 AM	0	0	1	2	1	0	0	0	0	0	0	2	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	2	2	10	6	0	0	0	0	0	0	14	34
APPROACH %	0%	50%	50%	63%	38%	0%	0%	0%	0%	0%	0%	100%	
APP/DEPART	4	/	16	16	/	6	0	/	12	14	/	0	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	1	1	8	3	0	0	0	0	0	0	7	20
APPROACH %	0%	50%	50%	73%	27%	0%	0%	0%	0%	0%	0%	100%	
PEAK HR FACTOR		0.500			0.688			0.000			0.438		0.556
APP/DEPART	2	/	8	11	/	3	0	/	9	7	/	0	0
PM 03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	1	0	1	1	0	0	0	0	0	0	1	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
4:30 PM	0	0	0	2	1	0	0	0	0	0	0	1	4
4:45 PM	0	0	0	3	0	0	0	0	0	0	0	1	4
5:00 PM	0	0	0	1	2	0	0	0	0	0	0	0	3
5:15 PM	0	0	0	1	0	0	0	0	0	0	0	2	3
5:30 PM	0	0	0	1	1	0	0	0	0	0	0	1	3
5:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
VOLUMES	0	1	0	11	5	0	0	0	0	0	0	7	24
APPROACH %	0%	100%	0%	69%	31%	0%	0%	0%	0%	0%	0%	100%	
APP/DEPART	1	/	8	16	/	5	0	/	11	7	/	0	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	0	0	0	7	3	0	0	0	0	0	0	4	14
APPROACH %	0%	0%	0%	70%	30%	0%	0%	0%	0%	0%	0%	100%	
PEAK HR FACTOR		0.000			0.833			0.000			0.500		0.875
APP/DEPART	0	/	4	10	/	3	0	/	7	4	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	2
0	0	0	1
0	0	0	2
0	0	0	1
0	0	0	0
0	0	0	1
0	0	0	3
0	0	0	2
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	12
0	0	0	6
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	2
0	0	0	2

El Prado — NORTH SIDE

Kimball — WEST SIDE — EAST SIDE — Kimball

SOUTH SIDE — El Prado

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	El Prado	LOCATION #:	10
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND El Prado			SOUTHBOUND El Prado			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 0	EL 1	ET 0.5	ER 0.5	WL 0.5	WT 0.5	WR 1	TOTAL
7:00 AM	0	0	0	6	4	0	0	0	0	0	0	5	15
7:15 AM	0	2	1	5	2	1	0	0	0	1	0	5	17
7:30 AM	0	3	3	5	1	0	0	0	0	0	0	7	19
7:45 AM	0	2	2	8	2	0	0	0	0	1	0	4	19
8:00 AM	0	2	0	9	2	0	1	0	0	3	0	4	21
8:15 AM	0	2	3	5	2	0	0	0	0	1	0	8	21
8:30 AM	0	4	0	7	1	0	0	0	0	0	0	3	15
8:45 AM	0	3	0	6	5	0	0	0	0	1	0	3	18
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	18	9	51	19	1	1	0	0	7	0	39	145
APPROACH %	0%	67%	33%	72%	27%	1%	100%	0%	0%	15%	0%	85%	
APP/DEPART	27	/	58	71	/	26	1	/	60	46	/	1	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	0	9	8	27	7	0	1	0	0	5	0	23	80
APPROACH %	0%	53%	47%	79%	21%	0%	100%	0%	0%	18%	0%	82%	
PEAK HR FACTOR		0.708			0.773			0.250			0.778		0.952
APP/DEPART	17	/	33	34	/	12	1	/	35	28	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	2	0	13	1	0	0	0	0	0	0	3	19
4:15 PM	0	0	0	5	2	0	0	0	0	0	0	9	16
4:30 PM	0	2	1	5	2	0	0	0	0	0	0	5	15
4:45 PM	0	2	0	6	1	0	0	0	0	2	0	0	11
5:00 PM	0	4	0	6	2	0	0	0	0	0	0	6	18
5:15 PM	0	0	0	4	0	0	0	0	0	0	0	0	4
5:30 PM	0	0	1	3	3	0	0	0	0	0	0	3	10
5:45 PM	0	1	1	0	2	0	0	0	0	0	0	3	7
VOLUMES	0	11	3	42	13	0	0	0	0	2	0	29	100
APPROACH %	0%	79%	21%	76%	24%	0%	0%	0%	0%	6%	0%	94%	
APP/DEPART	14	/	40	55	/	15	0	/	45	31	/	0	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	6	1	29	6	0	0	0	0	2	0	17	61
APPROACH %	0%	86%	14%	83%	17%	0%	0%	0%	0%	11%	0%	89%	
PEAK HR FACTOR		0.583			0.625			0.000			0.528		0.803
APP/DEPART	7	/	23	35	/	8	0	/	30	19	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: Mountain
EAST & WEST: Kimball

PROJECT #: SC0952
LOCATION #: 11
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

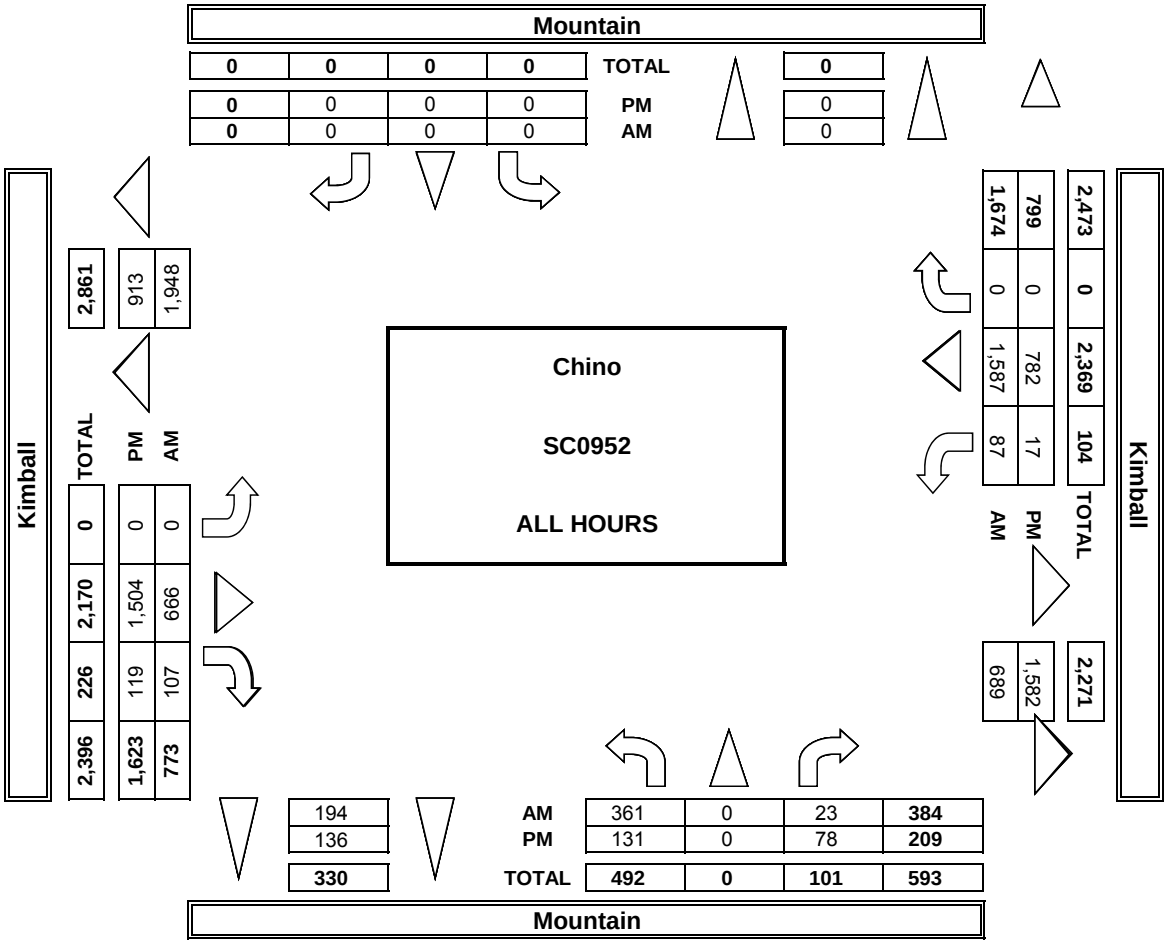
Add U-Turns to Left Turns

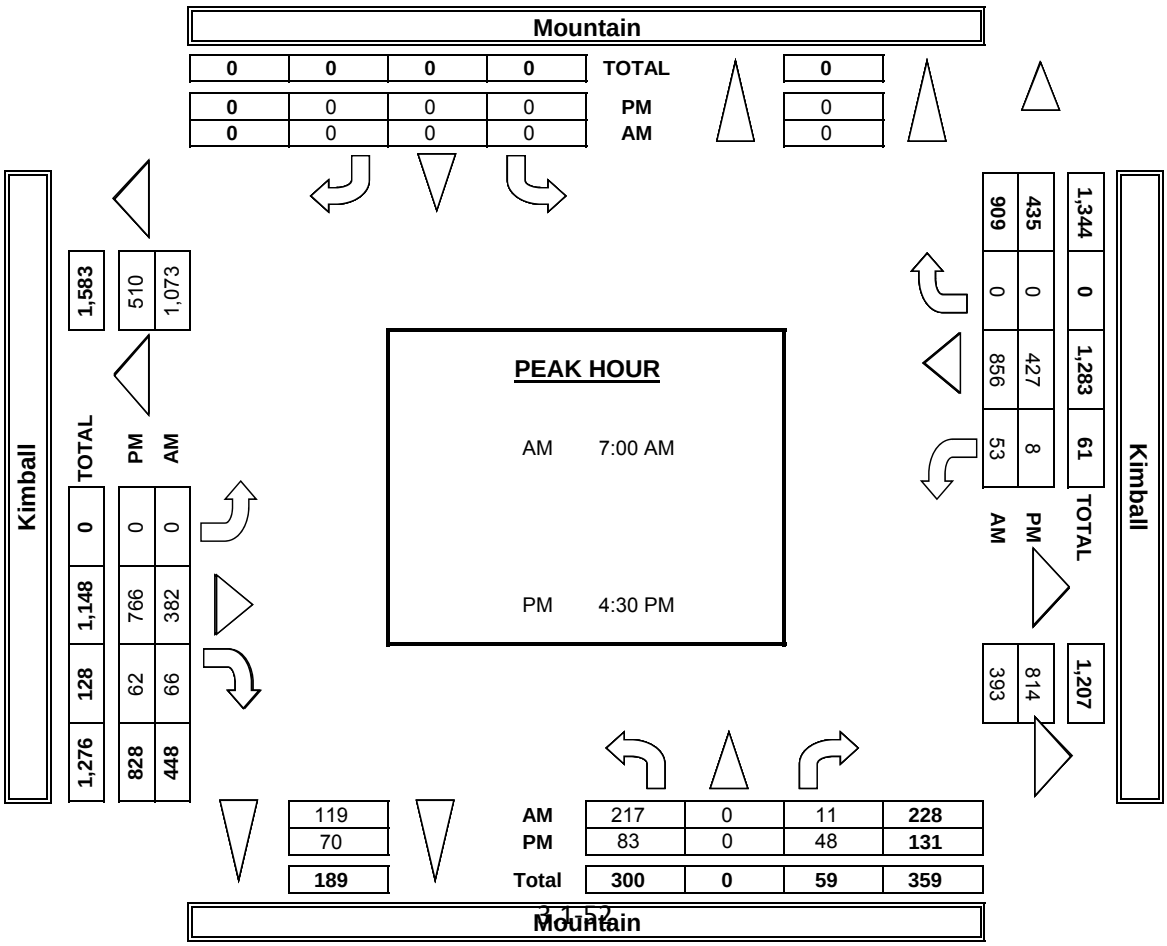
		NORTHBOUND (Mountain)			SOUTHBOUND (Mountain)			EASTBOUND (Kimball)			WESTBOUND (Kimball)				U-TURNS					RTOR			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 2	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	59	0	3	0	0	0	0	87	10	6	244	0	409	0	0	0	0	0	3	0	1	0
	7:15 AM	47	0	0	0	0	0	0	74	12	10	208	0	351	0	0	0	0	0	0	0	2	0
	7:30 AM	59	0	4	0	0	0	0	122	22	12	194	0	413	0	0	0	0	0	2	0	1	0
	7:45 AM	52	0	4	0	0	0	0	99	22	25	210	0	412	0	0	0	0	0	0	0	1	0
	8:00 AM	47	0	3	0	0	0	0	70	11	12	214	0	357	0	0	0	0	0	3	0	0	0
	8:15 AM	38	0	3	0	0	0	0	89	9	12	162	0	313	0	0	0	0	0	1	0	2	0
	8:30 AM	32	0	4	0	0	0	0	63	10	5	180	0	294	0	0	0	0	0	0	0	1	0
	8:45 AM	27	0	2	0	0	0	0	62	11	5	175	0	282	0	0	0	0	0	2	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	361	0	23	0	0	0	0	666	107	87	1,587	0	2,831	0	0	0	0	0	11	0	8	0
	APPROACH %	94%	0%	6%	0%	0%	0%	0%	86%	14%	5%	95%	0%										
	APP/DEPART	384	/	0	0	/	194	773	/	689	1,674	/	1,948	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	217	0	11	0	0	0	0	382	66	53	856	0	1,585						5	0	5	0
	APPROACH %	95%	0%	5%	0%	0%	0%	0%	85%	15%	6%	94%	0%										
	PEAK HR FACTOR		0.905			0.000			0.778			0.909		0.959									
	APP/DEPART	228	/	0	0	/	119	448	/	393	909	/	1,073	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	17	0	5	0	0	0	0	179	10	3	81	0	295	0	0	0	0	0	1	0	0	0
	4:15 PM	9	0	12	0	0	0	0	145	11	5	95	0	277	0	0	0	0	0	4	0	0	0
	4:30 PM	36	0	27	0	0	0	0	162	14	3	143	0	385	0	0	0	0	0	10	0	1	0
	4:45 PM	20	0	7	0	0	0	0	173	11	2	91	0	304	0	0	0	0	0	3	0	1	0
	5:00 PM	14	0	10	0	0	0	0	230	20	2	105	0	381	0	0	0	0	0	5	0	0	0
	5:15 PM	13	0	4	0	0	0	0	201	17	1	88	0	324	0	0	0	0	0	3	0	0	0
	5:30 PM	15	0	7	0	0	0	0	215	18	1	104	0	360	0	0	0	0	0	3	0	1	0
	5:45 PM	7	0	6	0	0	0	0	199	18	0	75	0	305	0	0	0	0	0	5	0	1	0
	VOLUMES	131	0	78	0	0	0	0	1,504	119	17	782	0	2,631	0	0	0	0	0	34	0	4	0
	APPROACH %	63%	0%	37%	0%	0%	0%	0%	93%	7%	2%	98%	0%										
	APP/DEPART	209	/	0	0	/	136	1,623	/	1,582	799	/	913	0									
	BEGIN PEAK HR		4:30 PM																				
	VOLUMES	83	0	48	0	0	0	0	766	62	8	427	0	1,394						21	0	2	0
	APPROACH %	63%	0%	37%	0%	0%	0%	0%	93%	7%	2%	98%	0%										
	PEAK HR FACTOR		0.520			0.000			0.828			0.745		0.905									
	APP/DEPART	131	/	0	0	/	70	828	/	814	435	/	510	0									

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Mountain	LOCATION #:	11
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

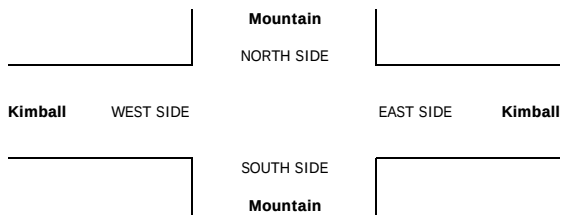
	NORTHBOUND (Mountain)			SOUTHBOUND (Mountain)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 2	WR X	TOTAL
7:00 AM	3	0	1	0	0	0	0	9	0	1	1	0	15
7:15 AM	4	0	0	0	0	0	0	6	1	0	2	0	13
7:30 AM	1	0	1	0	0	0	0	7	0	1	5	0	15
7:45 AM	1	0	0	0	0	0	0	10	1	1	6	0	19
8:00 AM	2	0	1	0	0	0	0	1	4	2	6	0	16
8:15 AM	3	0	0	0	0	0	0	8	1	3	3	0	18
8:30 AM	1	0	2	0	0	0	0	5	1	3	5	0	17
8:45 AM	3	0	0	0	0	0	0	3	2	1	6	0	15
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	18	0	5	0	0	0	0	49	10	12	34	0	128
APPROACH %	78%	0%	22%	0%	0%	0%	0%	83%	17%	26%	74%	0%	
APP/DEPART	23	/	0	0	/	22	59	/	54	46	/	52	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	7	0	3	0	0	0	0	24	7	9	20	0	70
APPROACH %	70%	0%	30%	0%	0%	0%	0%	77%	23%	31%	69%	0%	
PEAK HR FACTOR		0.833			0.000			0.705			0.906		0.921
APP/DEPART	10	/	0	0	/	16	31	/	27	29	/	27	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	0	0	0	0	0	6	1	0	3	0	11
4:15 PM	0	0	0	0	0	0	0	4	0	0	5	0	9
4:30 PM	0	0	1	0	0	0	0	6	2	0	3	0	12
4:45 PM	2	0	0	0	0	0	0	3	0	0	2	0	7
5:00 PM	1	0	0	0	0	0	0	2	4	0	3	0	10
5:15 PM	2	0	0	0	0	0	0	8	0	0	0	0	10
5:30 PM	0	0	0	0	0	0	0	5	0	0	1	0	6
5:45 PM	0	0	0	0	0	0	0	6	0	0	3	0	9
VOLUMES	6	0	1	0	0	0	0	40	7	0	20	0	74
APPROACH %	86%	0%	14%	0%	0%	0%	0%	85%	15%	0%	100%	0%	
APP/DEPART	7	/	0	0	/	7	47	/	41	20	/	26	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	3	0	1	0	0	0	0	19	3	0	13	0	39
APPROACH %	75%	0%	25%	0%	0%	0%	0%	86%	14%	0%	100%	0%	
PEAK HR FACTOR		0.500			0.000			0.688			0.650		0.813
APP/DEPART	4	/	0	0	/	3	22	/	20	13	/	16	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
1	0	0	0
0	0	1	0
1	0	0	0
0	0	0	0
1	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
3	0	2	0
1	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Mountain	LOCATION #:	11
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Mountain)			SOUTHBOUND (Mountain)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 2	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
	7:15 AM	1	0	0	0	0	0	0	3	0	0	0	0	4
	7:30 AM	1	0	0	0	0	0	0	0	0	0	2	0	3
	7:45 AM	0	0	1	0	0	0	0	2	0	0	0	0	3
	8:00 AM	0	0	0	0	0	0	0	0	0	1	3	0	4
	8:15 AM	2	0	1	0	0	0	0	1	0	0	1	0	5
	8:30 AM	1	0	0	0	0	0	0	1	0	0	2	0	4
	8:45 AM	0	0	0	0	0	0	0	1	1	0	0	0	2
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	5	0	2	0	0	0	0	10	1	1	10	0	29
	APPROACH %	71%	0%	29%	0%	0%	0%	0%	91%	9%	9%	91%	0%	
	APP/DEPART	7	/	0	0	/	2	11	/	12	11	/	15	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	3	0	2	0	0	0	0	4	0	1	6	0	16
	APPROACH %	60%	0%	40%	0%	0%	0%	0%	100%	0%	14%	86%	0%	
	PEAK HR FACTOR		0.417			0.000			0.500			0.438		0.800
	APP/DEPART	5	/	0	0	/	1	4	/	6	7	/	9	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	1	0	0	0	0	0	0	2	1	0	3	0	7
	4:30 PM	0	0	1	0	0	0	0	1	0	0	0	0	2
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
	5:15 PM	0	0	0	0	0	0	0	2	1	0	0	0	3
	5:30 PM	0	0	0	0	0	0	0	1	1	0	1	0	3
	5:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
	VOLUMES	1	0	1	0	0	0	0	7	4	0	5	0	18
	APPROACH %	50%	0%	50%	0%	0%	0%	0%	64%	36%	0%	100%	0%	
	APP/DEPART	2	/	0	0	/	4	11	/	8	5	/	6	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	1	0	1	0	0	0	0	4	1	0	4	0	11
	APPROACH %	50%	0%	50%	0%	0%	0%	0%	80%	20%	0%	100%	0%	
	PEAK HR FACTOR		0.500			0.000			0.417			0.333		0.393
	APP/DEPART	2	/	0	0	/	1	5	/	5	4	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Mountain	LOCATION #:	11
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Mountain			SOUTHBOUND Mountain			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 2	WR X	TOTAL
7:00 AM	3	0	2	0	0	0	0	9	1	4	4	0	23
7:15 AM	4	0	0	0	0	0	0	3	2	2	8	0	19
7:30 AM	2	0	0	0	0	0	0	5	3	1	4	0	15
7:45 AM	1	0	0	0	0	0	0	6	4	2	3	0	16
8:00 AM	3	0	0	0	0	0	0	7	1	0	4	0	15
8:15 AM	3	0	1	0	0	0	0	6	0	2	4	0	16
8:30 AM	0	0	1	0	0	0	0	7	3	1	2	0	14
8:45 AM	1	0	1	0	0	0	0	5	4	1	5	0	17
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	17	0	5	0	0	0	0	48	18	13	34	0	135
APPROACH %	77%	0%	23%	0%	0%	0%	0%	73%	27%	28%	72%	0%	
APP/DEPART	22	/	0	0	/	31	66	/	53	47	/	51	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	10	0	2	0	0	0	0	23	10	9	19	0	73
APPROACH %	83%	0%	17%	0%	0%	0%	0%	70%	30%	32%	68%	0%	
PEAK HR FACTOR		0.600			0.000			0.825			0.700		0.793
APP/DEPART	12	/	0	0	/	19	33	/	25	28	/	29	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	2	0	0	0	0	3	0	2	3	0	11
4:15 PM	2	0	2	0	0	0	0	4	0	1	2	0	11
4:30 PM	0	0	1	0	0	0	0	8	0	0	6	0	15
4:45 PM	1	0	1	0	0	0	0	10	1	0	2	0	15
5:00 PM	0	0	1	0	0	0	0	4	1	1	2	0	9
5:15 PM	0	0	0	0	0	0	0	4	1	1	3	0	9
5:30 PM	0	0	3	0	0	0	0	7	1	1	3	0	15
5:45 PM	0	0	0	0	0	0	0	4	0	0	1	0	5
VOLUMES	4	0	10	0	0	0	0	44	4	6	22	0	90
APPROACH %	29%	0%	71%	0%	0%	0%	0%	92%	8%	21%	79%	0%	
APP/DEPART	14	/	0	0	/	10	48	/	54	28	/	26	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	4	0	6	0	0	0	0	25	1	3	13	0	52
APPROACH %	40%	0%	60%	0%	0%	0%	0%	96%	4%	19%	81%	0%	
PEAK HR FACTOR		0.625			0.000			0.591			0.667		0.867
APP/DEPART	10	/	0	0	/	4	26	/	31	16	/	17	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
2	0	0	0
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
3	0	1	0
2	0	1	0

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Mountain

NORTH SIDE

Kimball WEST SIDE EAST SIDE **Kimball**

SOUTH SIDE

Mountain

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: San Antonio
EAST & WEST: Kimball

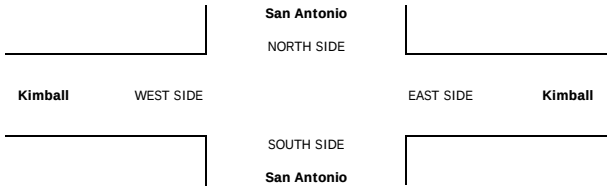
PROJECT #: SC0952
LOCATION #: 12
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

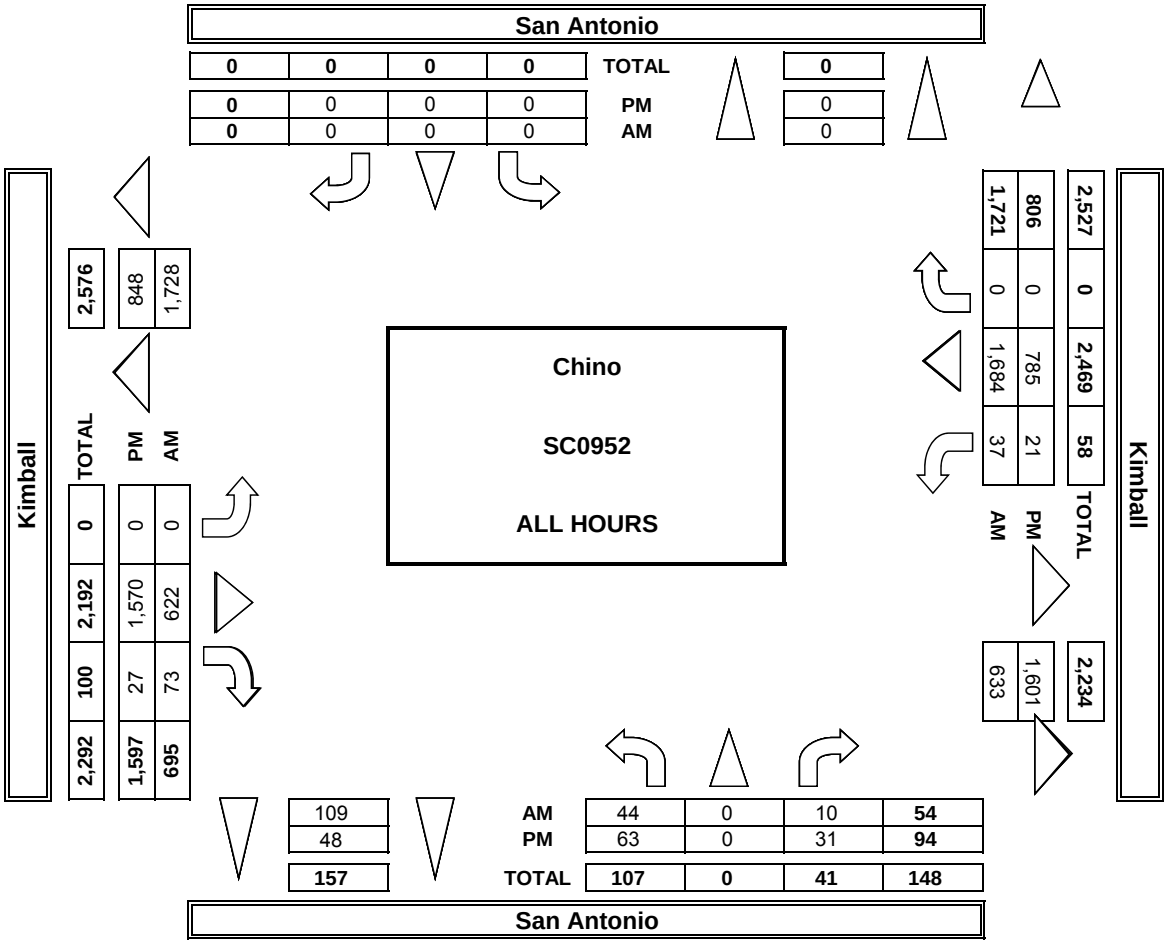
		NORTHBOUND San Antonio			SOUTHBOUND San Antonio			EASTBOUND Kimball			WESTBOUND Kimball				U-TURNS					RTOR			
	LANES:	NL 1	NT 0	NR 1	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	10	0	0	0	0	0	0	67	9	5	240	0	331	0	0	0	0	0	0	0	0	0
	7:15 AM	6	0	1	0	0	0	0	77	7	4	255	0	350	0	0	0	0	0	1	0	0	0
	7:30 AM	8	0	2	0	0	0	0	80	9	3	193	0	295	0	0	0	1	1	1	0	0	0
	7:45 AM	3	0	1	0	0	0	0	94	14	10	232	0	354	0	0	0	0	0	1	0	0	0
	8:00 AM	4	0	1	0	0	0	0	83	5	3	191	0	287	0	0	0	0	0	0	0	1	0
	8:15 AM	7	0	1	0	0	0	0	94	8	2	222	0	334	0	0	0	0	0	1	0	1	0
	8:30 AM	2	0	3	0	0	0	0	65	10	6	175	0	261	0	0	0	0	0	1	0	0	0
	8:45 AM	4	0	1	0	0	0	0	62	11	4	176	0	258	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	44	0	10	0	0	0	0	622	73	37	1,684	0	2,470	0	0	0	1	1	5	0	2	0
	APPROACH %	81%	0%	19%	0%	0%	0%	0%	89%	11%	2%	98%	0%										
	APP/DEPART	54	/	0	0	/	109	695	/	633	1,721	/	1,728	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	27	0	4	0	0	0	0	318	39	22	920	0	1,330						3	0	0	0
	APPROACH %	87%	0%	13%	0%	0%	0%	0%	89%	11%	2%	98%	0%										
	PEAK HR FACTOR		0.775			0.000			0.826			0.909		0.939									
	APP/DEPART	31	/	0	0	/	60	357	/	323	942	/	947	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	13	0	6	0	0	0	0	166	6	2	102	0	295	0	0	0	0	0	4	0	0	0
	4:15 PM	6	0	3	0	0	0	0	206	1	1	93	0	310	0	0	0	0	0	0	0	0	0
	4:30 PM	9	0	11	0	0	0	0	193	0	9	100	0	322	0	0	0	0	0	4	0	0	0
	4:45 PM	6	0	2	0	0	0	0	175	8	3	101	0	295	0	0	0	0	0	0	0	0	0
	5:00 PM	9	0	4	0	0	0	0	207	3	1	112	0	336	0	0	0	0	0	0	0	0	0
	5:15 PM	7	0	0	0	0	0	0	217	1	2	80	0	307	0	0	0	0	0	0	0	0	0
	5:30 PM	13	0	3	0	0	0	0	199	1	2	118	0	336	0	0	0	0	0	1	0	0	0
	5:45 PM	0	0	2	0	0	0	0	207	7	1	79	0	296	0	0	0	0	0	1	0	0	0
	VOLUMES	63	0	31	0	0	0	0	1,570	27	21	785	0	2,497	0	0	0	0	0	10	0	0	0
	APPROACH %	67%	0%	33%	0%	0%	0%	0%	98%	2%	3%	97%	0%										
	APP/DEPART	94	/	0	0	/	48	1,597	/	1,601	806	/	848	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	29	0	9	0	0	0	0	830	12	6	389	0	1,275						2	0	0	0
	APPROACH %	76%	0%	24%	0%	0%	0%	0%	99%	1%	2%	98%	0%										
	PEAK HR FACTOR		0.594			0.000			0.966			0.823		0.949									
	APP/DEPART	38	/	0	0	/	18	842	/	839	395	/	418	0									

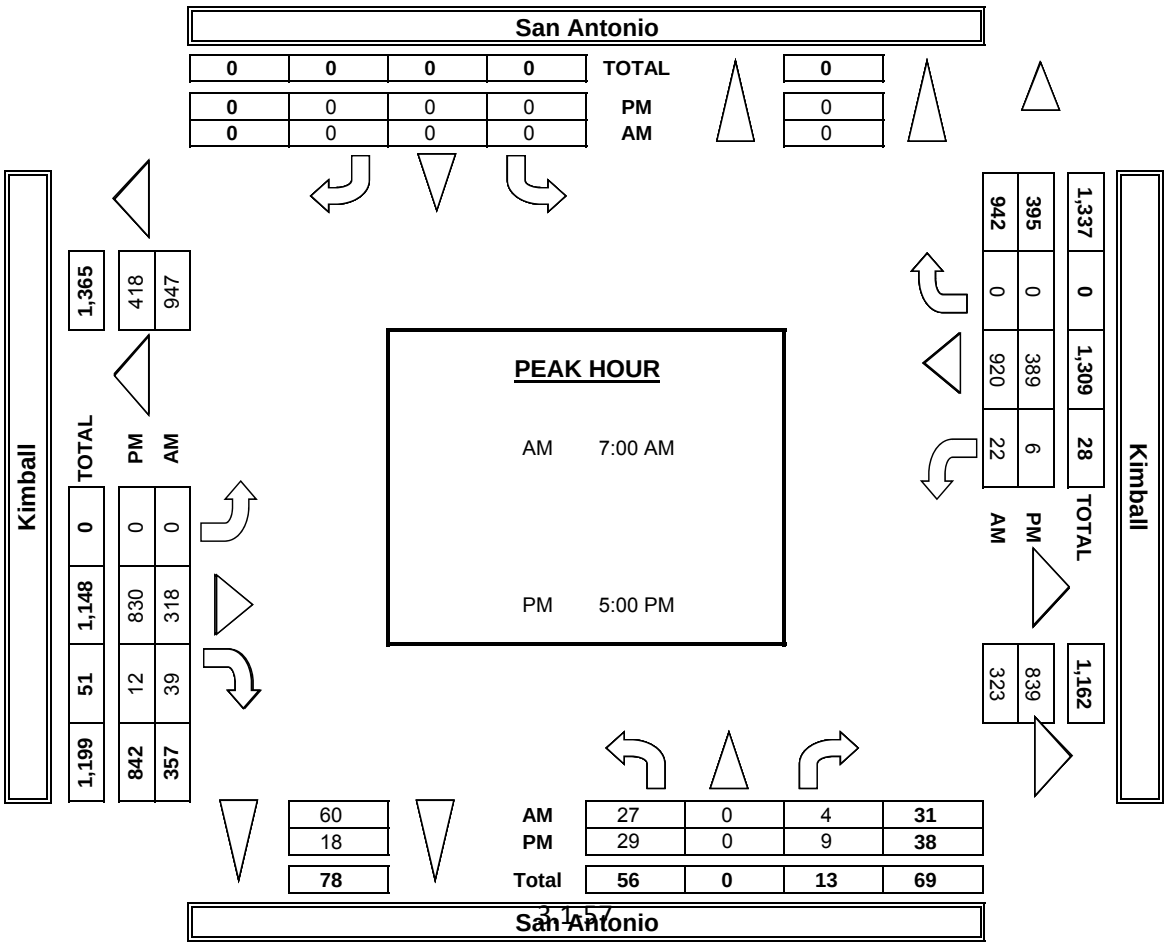


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	1	2	3	0	0	0	0	0	0	0	1	2	3
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	San Antonio	LOCATION #:	12
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

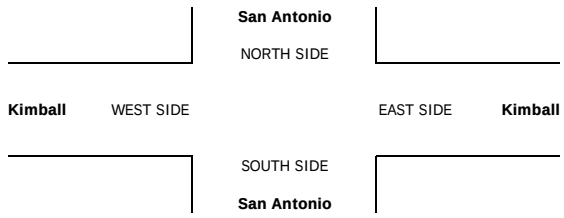
	NORTHBOUND San Antonio			SOUTHBOUND San Antonio			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT 0	NR 1	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	0	0	0	0	0	0	0	5	0	0	8	0	13
7:15 AM	0	0	0	0	0	0	0	6	1	0	6	0	13
7:30 AM	5	0	0	0	0	0	0	6	0	0	4	0	15
7:45 AM	1	0	0	0	0	0	0	6	0	0	5	0	12
8:00 AM	0	0	0	0	0	0	0	7	1	0	3	0	11
8:15 AM	0	0	0	0	0	0	0	10	1	0	7	0	18
8:30 AM	0	0	0	0	0	0	0	7	0	1	5	0	13
8:45 AM	1	0	0	0	0	0	0	9	0	1	5	0	16
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	7	0	0	0	0	0	0	56	3	2	43	0	111
APPROACH %	100%	0%	0%	0%	0%	0%	0%	95%	5%	4%	96%	0%	
APP/DEPART	7	/	0	0	/	5	59	/	56	45	/	50	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	1	0	0	0	0	0	0	33	2	2	20	0	58
APPROACH %	100%	0%	0%	0%	0%	0%	0%	94%	6%	9%	91%	0%	
PEAK HR FACTOR		0.250			0.000			0.795			0.786		0.806
APP/DEPART	1	/	0	0	/	4	35	/	33	22	/	21	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	8	1	0	3	0	12
4:15 PM	0	0	0	0	0	0	0	11	1	0	1	0	13
4:30 PM	0	0	0	0	0	0	0	2	0	0	4	0	6
4:45 PM	0	0	0	0	0	0	0	4	0	0	2	0	6
5:00 PM	0	0	0	0	0	0	0	1	0	1	1	0	3
5:15 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
5:30 PM	0	0	0	0	0	0	0	1	0	0	3	0	4
5:45 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
VOLUMES	0	0	0	0	0	0	0	31	2	1	17	0	51
APPROACH %	0%	0%	0%	0%	0%	0%	0%	94%	6%	6%	94%	0%	
APP/DEPART	0	/	0	0	/	3	33	/	31	18	/	17	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	0	0	0	0	0	0	25	2	0	10	0	37
APPROACH %	0%	0%	0%	0%	0%	0%	0%	93%	7%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.563			0.625		0.712
APP/DEPART	0	/	0	0	/	2	27	/	25	10	/	10	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	San Antonio	LOCATION #:	12
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND San Antonio			SOUTHBOUND San Antonio			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT 0	NR 1	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
7:15 AM	0	0	0	0	0	0	0	1	0	0	3	0	4
7:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
7:45 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
8:00 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:30 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
8:45 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	11	0	0	14	0	25
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	0	11	/	11	14	/	14	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	0	0	0	0	0	6	0	0	8	0	14
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.750			0.667		0.875
APP/DEPART	0	/	0	0	/	0	6	/	6	8	/	8	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	7	0	0	4	0	11
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	0	7	/	7	4	/	4	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	0	0	0	0	0	0	0	6	0	0	4	0	10
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.750			0.500		0.625
APP/DEPART	0	/	0	0	/	0	6	/	6	4	/	4	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
0	0	0	0
0	0	0	0
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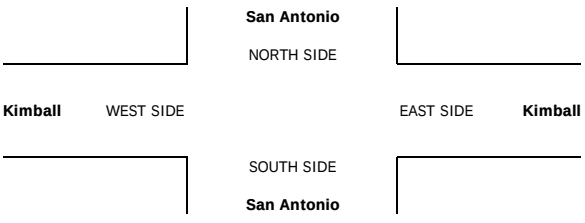
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	San Antonio	LOCATION #:	12
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND San Antonio			SOUTHBOUND San Antonio			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT 0	NR 1	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	0	0	0	0	0	0	0	3	4	2	8	0	17
7:15 AM	1	0	1	0	0	0	0	9	2	0	3	0	16
7:30 AM	2	0	2	0	0	0	0	3	0	0	7	0	14
7:45 AM	1	0	1	0	0	0	0	12	2	3	6	0	25
8:00 AM	2	0	1	0	0	0	0	2	4	2	5	0	16
8:15 AM	2	0	1	0	0	0	0	9	2	1	9	0	24
8:30 AM	1	0	2	0	0	0	0	3	4	0	4	0	14
8:45 AM	1	0	1	0	0	0	0	4	1	0	8	0	15
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	10	0	9	0	0	0	0	45	19	8	50	0	141
APPROACH %	53%	0%	47%	0%	0%	0%	0%	70%	30%	14%	86%	0%	
APP/DEPART	19	/	0	0	/	27	64	/	54	58	/	60	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	7	0	5	0	0	0	0	26	8	6	27	0	79
APPROACH %	58%	0%	42%	0%	0%	0%	0%	76%	24%	18%	82%	0%	
PEAK HR FACTOR		0.750			0.000			0.607			0.825		0.790
APP/DEPART	12	/	0	0	/	14	34	/	31	33	/	34	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	1	0	0	0	0	4	1	1	2	0	10
4:15 PM	4	0	1	0	0	0	0	8	0	0	5	0	18
4:30 PM	2	0	2	0	0	0	0	2	0	3	2	0	11
4:45 PM	3	0	0	0	0	0	0	9	2	0	6	0	20
5:00 PM	2	0	1	0	0	0	0	4	0	0	3	0	10
5:15 PM	4	0	0	0	0	0	0	1	0	2	1	0	8
5:30 PM	1	0	1	0	0	0	0	7	0	1	3	0	13
5:45 PM	0	0	1	0	0	0	0	4	0	0	1	0	6
VOLUMES	17	0	7	0	0	0	0	39	3	7	23	0	96
APPROACH %	71%	0%	29%	0%	0%	0%	0%	93%	7%	23%	77%	0%	
APP/DEPART	24	/	0	0	/	10	42	/	46	30	/	40	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	10	0	4	0	0	0	0	23	3	4	15	0	59
APPROACH %	71%	0%	29%	0%	0%	0%	0%	88%	12%	21%	79%	0%	
PEAK HR FACTOR		0.700			0.000			0.591			0.792		0.738
APP/DEPART	14	/	0	0	/	7	26	/	27	19	/	25	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Wed, May 18, 16

LOCATION: Chino
NORTH & SOUTH: Fern
EAST & WEST: Kimball

PROJECT #: SC0952
LOCATION #: 13
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Fern)			SOUTHBOUND (Fern)			EASTBOUND (Kimball)			WESTBOUND (Kimball)				U-TURNS					RTOR			
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	6	0	2	3	0	2	3	49	8	3	233	0	309	0	0	0	0	0	1	1	0	0
	7:15 AM	4	0	2	4	0	0	1	71	7	4	252	0	345	0	0	0	0	0	1	0	3	0
	7:30 AM	5	0	5	1	1	0	1	73	10	6	194	0	296	0	0	0	0	0	4	0	1	0
	7:45 AM	6	0	3	6	0	0	1	67	23	17	242	0	365	0	0	0	0	0	3	0	2	0
	8:00 AM	4	0	4	1	0	0	2	65	11	12	191	2	292	0	0	0	0	0	4	0	2	0
	8:15 AM	8	0	3	0	0	0	1	81	16	4	216	0	329	0	0	0	0	0	2	0	1	0
	8:30 AM	3	0	1	0	0	1	2	62	9	4	183	0	265	0	0	0	0	0	1	1	1	0
	8:45 AM	5	0	1	1	0	0	0	62	5	8	175	0	257	0	0	0	0	0	0	0	1	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	41	0	21	16	1	3	11	530	89	58	1,686	2	2,458	0	0	0	0	0	16	2	11	0
	APPROACH %	66%	0%	34%	80%	5%	15%	2%	84%	14%	3%	97%	0%										
	APP/DEPART	62	/	13	20	/	148	630	/	567	1,746	/	1,730	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	21	0	12	14	1	2	6	260	48	30	921	0	1,315						9	1	6	0
	APPROACH %	64%	0%	36%	82%	6%	12%	2%	83%	15%	3%	97%	0%										
	PEAK HR FACTOR		0.825			0.708			0.863			0.918		0.901									
	APP/DEPART	33	/	6	17	/	79	314	/	286	951	/	944	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	6	0	2	7	2	2	0	173	6	6	96	0	300	0	0	0	0	0	1	2	2	0
	4:15 PM	12	0	8	0	1	2	0	208	6	5	85	0	327	0	0	0	0	0	1	1	0	0
	4:30 PM	22	0	17	36	0	10	0	201	6	2	68	0	362	0	0	0	0	0	7	9	0	0
	4:45 PM	12	1	6	4	1	1	1	180	2	7	91	0	306	0	0	0	0	0	3	1	0	0
	5:00 PM	8	0	8	4	0	3	1	210	0	1	97	0	332	0	0	0	0	0	2	1	0	0
	5:15 PM	5	0	5	20	0	3	1	218	2	0	80	0	334	0	0	0	0	0	5	3	1	0
	5:30 PM	12	0	11	65	6	17	0	197	6	1	77	0	392	0	0	0	0	0	7	11	4	0
	5:45 PM	3	0	7	5	0	1	1	207	3	4	86	0	317	0	0	0	0	0	4	1	0	0
	VOLUMES	80	1	64	141	10	39	4	1,594	31	26	680	0	2,670	0	0	0	0	0	30	29	7	0
	APPROACH %	55%	1%	44%	74%	5%	21%	0%	98%	2%	4%	96%	0%										
	APP/DEPART	145	/	5	190	/	67	1,629	/	1,799	706	/	799	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	28	0	31	94	6	24	3	832	11	6	340	0	1,375						18	16	5	0
	APPROACH %	47%	0%	53%	76%	5%	19%	0%	98%	1%	2%	98%	0%										
	PEAK HR FACTOR		0.641			0.352			0.957			0.883		0.877									
	APP/DEPART	59	/	3	124	/	23	846	/	957	346	/	392	0									

Fern

NORTH SIDE

Kimball WEST SIDE EAST SIDE **Kimball**

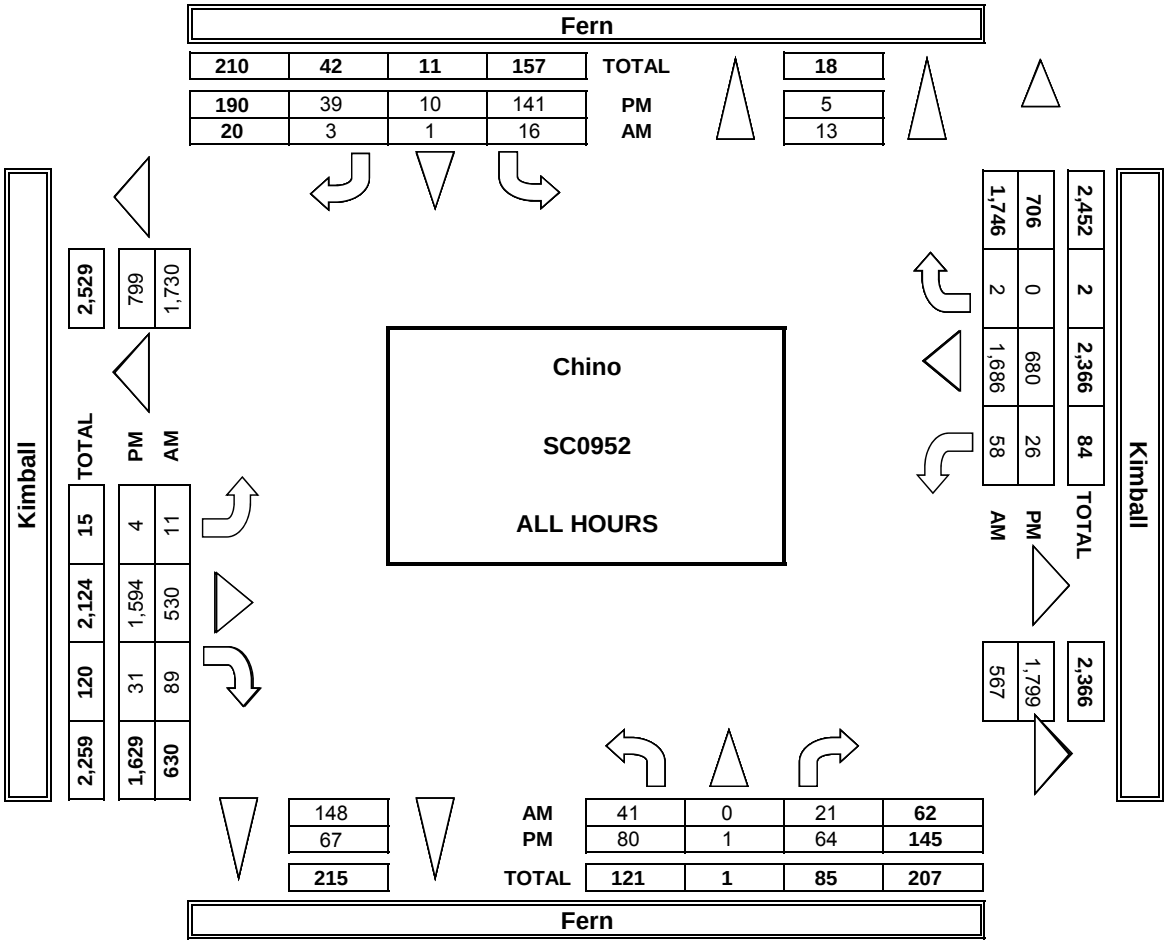
SOUTH SIDE

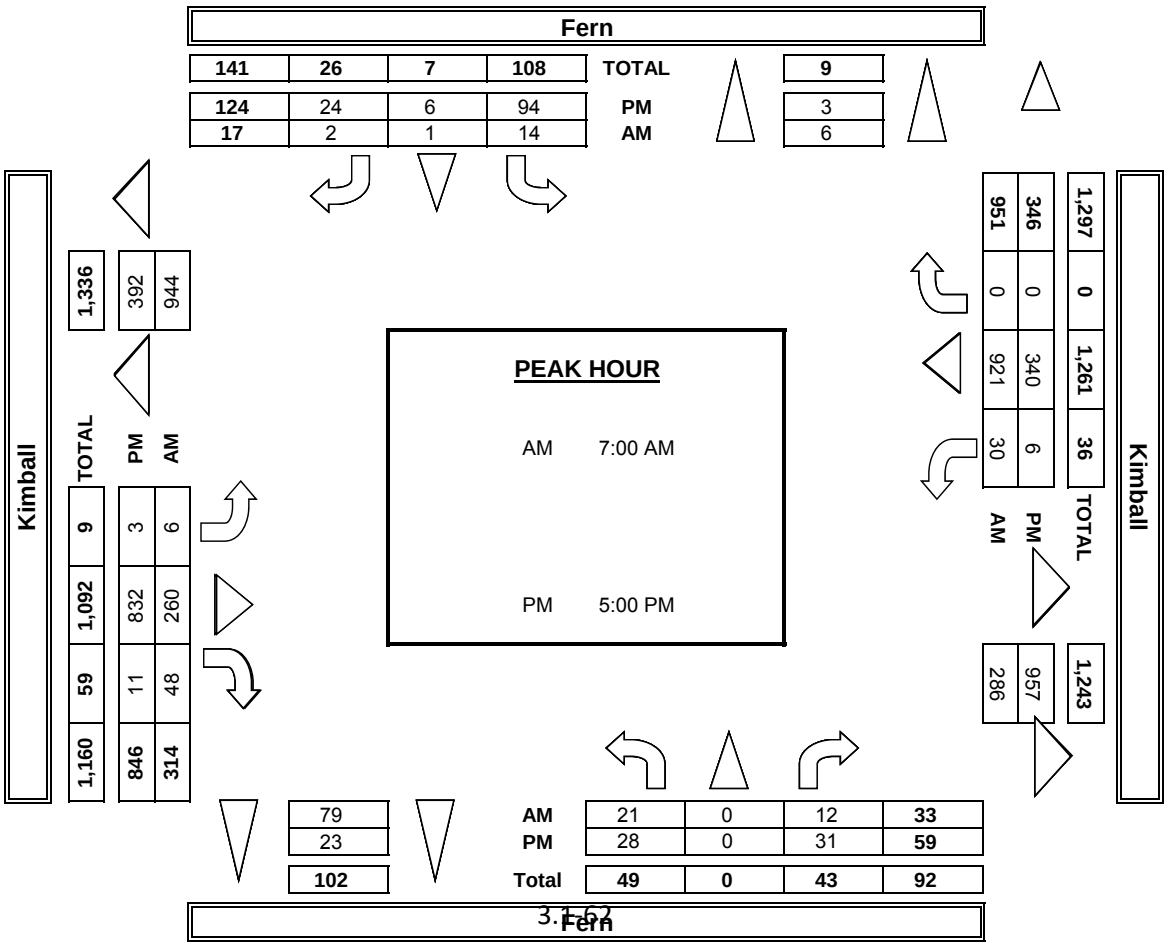
Fern

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	1	1	2	0	0	0	1	1	0	0	1	0	1
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:15 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	2	3	5	0	0	1	1	2	0	0	1	2	3
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	1	1	2	0	0	0	1	1	0	0	1	0	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	2	2	4	0	0	1	1	2	0	0	1	1	2

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Fern	LOCATION #:	13
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Fern)			SOUTHBOUND (Fern)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	1	0	0	0	0	0	0	3	1	2	5	0	12
7:15 AM	1	0	0	0	0	0	0	5	0	0	8	0	14
7:30 AM	0	0	1	0	0	0	0	2	1	0	4	0	8
7:45 AM	1	0	1	0	0	0	0	6	0	1	5	0	14
8:00 AM	1	0	0	0	0	0	0	9	1	0	7	1	19
8:15 AM	0	0	1	0	0	0	0	10	2	0	5	0	18
8:30 AM	1	0	0	0	0	1	0	12	0	0	4	0	18
8:45 AM	0	0	0	0	0	0	0	9	0	3	7	0	19
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	5	0	3	0	0	1	0	56	5	6	45	1	122
APPROACH %	63%	0%	38%	0%	0%	100%	0%	92%	8%	12%	87%	2%	
APP/DEPART	8	/	1	1	/	11	61	/	59	52	/	51	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	2	0	1	0	0	1	0	40	3	3	23	1	74
APPROACH %	67%	0%	33%	0%	0%	100%	0%	93%	7%	11%	85%	4%	
PEAK HR FACTOR		0.750			0.250			0.896			0.675		0.974
APP/DEPART	3	/	1	1	/	6	43	/	41	27	/	26	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	0	0	0	0	0	4	0	0	6	0	11
4:15 PM	2	0	4	0	1	0	0	5	0	0	1	0	13
4:30 PM	1	0	1	0	0	0	0	6	1	0	6	0	15
4:45 PM	0	1	0	1	1	0	1	4	0	0	4	0	12
5:00 PM	0	0	0	0	0	0	0	9	0	0	2	0	11
5:15 PM	0	0	0	0	0	0	0	5	1	0	1	0	7
5:30 PM	1	0	1	0	0	0	0	2	1	0	3	0	8
5:45 PM	2	0	0	0	0	0	0	5	0	0	3	0	10
VOLUMES	7	1	6	1	2	0	1	40	3	0	26	0	87
APPROACH %	50%	7%	43%	33%	67%	0%	2%	91%	7%	0%	100%	0%	
APP/DEPART	14	/	2	3	/	5	44	/	47	26	/	33	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	4	1	5	1	2	0	1	19	1	0	17	0	51
APPROACH %	40%	10%	50%	33%	67%	0%	5%	90%	5%	0%	100%	0%	
PEAK HR FACTOR		0.417			0.375			0.583			0.708		0.850
APP/DEPART	10	/	2	3	/	3	21	/	25	17	/	21	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Fern	LOCATION #:	13
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Fern)			SOUTHBOUND (Fern)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	1	0	1	0	0	0	0	1	0	0	2	0	5
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
7:30 AM	1	0	0	0	0	0	0	3	0	0	0	0	4
7:45 AM	1	0	0	0	0	0	0	3	0	0	0	0	4
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	1	0	0	0	0	0	0	2	0	1	4	0	8
8:30 AM	1	0	0	0	0	0	0	0	0	1	1	0	3
8:45 AM	1	0	0	0	0	0	0	0	0	1	1	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	6	0	1	0	0	0	0	10	0	3	8	0	28
APPROACH %	86%	0%	14%	0%	0%	0%	0%	100%	0%	27%	73%	0%	
APP/DEPART	7	/	0	0	/	3	10	/	11	11	/	14	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	3	0	0	0	0	0	0	8	0	1	4	0	16
APPROACH %	100%	0%	0%	0%	0%	0%	0%	100%	0%	20%	80%	0%	
PEAK HR FACTOR		0.750			0.000			0.667			0.250		0.500
APP/DEPART	3	/	0	0	/	1	8	/	8	5	/	7	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	1	1	0	0	0	3	0	0	0	0	5
4:15 PM	0	0	0	0	0	0	0	1	1	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	1	1	0	2
4:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:30 PM	0	0	1	0	0	0	0	2	2	0	1	0	6
5:45 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
VOLUMES	1	0	2	1	0	0	0	8	3	1	3	0	19
APPROACH %	33%	0%	67%	100%	0%	0%	0%	73%	27%	25%	75%	0%	
APP/DEPART	3	/	0	1	/	4	11	/	11	4	/	4	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	0	1	1	0	0	0	4	1	1	1	0	10
APPROACH %	50%	0%	50%	100%	0%	0%	0%	80%	20%	50%	50%	0%	
PEAK HR FACTOR		0.500			0.250			0.417			0.250		0.500
APP/DEPART	2	/	0	1	/	2	5	/	6	2	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Chino	PROJECT #:	SC0952
5/18/16	NORTH & SOUTH:	Fern	LOCATION #:	13
WEDNESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND (Fern)			SOUTHBOUND (Fern)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	2	0	1	0	0	0	0	2	1	0	6	0	12
7:15 AM	0	0	1	0	0	0	0	5	3	1	3	0	13
7:30 AM	3	0	3	0	0	0	0	1	1	0	3	0	11
7:45 AM	2	0	0	0	0	0	1	7	4	1	6	0	21
8:00 AM	1	0	2	0	0	0	0	4	0	1	5	1	14
8:15 AM	3	0	1	0	0	0	1	5	2	0	6	0	18
8:30 AM	0	0	0	0	0	0	0	2	2	0	4	0	8
8:45 AM	3	0	1	1	0	0	0	8	0	2	5	0	20
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	14	0	9	1	0	0	2	34	13	5	38	1	117
APPROACH %	61%	0%	39%	100%	0%	0%	4%	69%	27%	11%	86%	2%	
APP/DEPART	23	/	3	1	/	18	49	/	44	44	/	52	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	9	0	6	0	0	0	2	17	7	2	20	1	64
APPROACH %	60%	0%	40%	0%	0%	0%	8%	65%	27%	9%	87%	4%	
PEAK HR FACTOR		0.625			0.000			0.542			0.821		0.762
APP/DEPART	15	/	3	0	/	9	26	/	23	23	/	29	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	2	0	0	1	0	0	0	6	1	1	1	0	12
4:15 PM	3	0	1	0	0	0	0	7	2	1	3	0	17
4:30 PM	1	0	0	1	0	0	0	6	0	0	2	0	10
4:45 PM	1	0	0	0	0	0	0	8	1	0	4	0	14
5:00 PM	0	0	1	0	0	0	0	6	0	0	5	0	12
5:15 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
5:30 PM	0	0	0	0	0	0	0	4	0	0	3	0	7
5:45 PM	0	0	0	0	0	0	1	2	0	1	2	0	6
VOLUMES	7	0	2	2	0	0	1	41	4	3	22	0	82
APPROACH %	78%	0%	22%	100%	0%	0%	2%	89%	9%	12%	88%	0%	
APP/DEPART	9	/	1	2	/	7	46	/	45	25	/	29	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	7	0	1	2	0	0	0	27	4	2	10	0	53
APPROACH %	88%	0%	13%	100%	0%	0%	0%	87%	13%	17%	83%	0%	
PEAK HR FACTOR		0.500			0.500			0.861			0.600		0.779
APP/DEPART	8	/	0	2	/	6	31	/	30	12	/	17	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Euclid	LOCATION #:	1
	EAST & WEST:	SR-60 WB Ramp	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

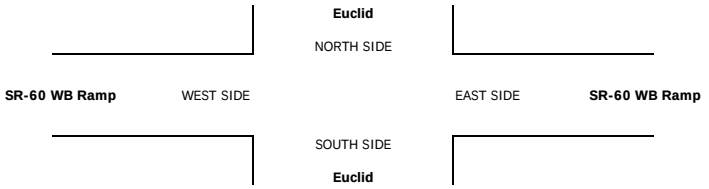
	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (SR-60 WB Ramp)			WESTBOUND (SR-60 WB Ramp)			
LANES:	NL 1	NT 3	NR X	SL X	ST 2	SR 1	EL X	ET X	ER X	WL 1.3	WT 0.3	WR 1.3	TOTAL
7:00 AM	72	119	0	0	167	94	0	0	0	86	1	76	615
7:15 AM	67	169	0	0	183	108	0	0	0	96	1	61	685
7:30 AM	56	166	0	0	216	96	0	0	0	101	0	84	719
7:45 AM	56	217	0	0	201	97	0	0	0	90	0	99	760
8:00 AM	60	210	0	0	243	115	0	0	0	113	1	85	827
8:15 AM	62	209	0	0	223	96	0	0	0	97	1	67	755
8:30 AM	60	181	0	0	155	86	0	0	0	84	0	79	645
8:45 AM	65	173	0	0	168	79	0	0	0	98	0	66	649
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	498	1,444	0	0	1,556	771	0	0	0	765	4	617	5,655
APPROACH %	26%	74%	0%	0%	67%	33%	0%	0%	0%	55%	0%	45%	
APP/DEPART	1,942	/	2,061	2,327	/	2,325	0	/	0	1,386	/	1,269	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	234	802	0	0	883	404	0	0	0	401	2	335	3,061
APPROACH %	23%	77%	0%	0%	69%	31%	0%	0%	0%	54%	0%	45%	
PEAK HR FACTOR		0.949			0.899			0.000			0.927		0.925
APP/DEPART	1,036	/	1,137	1,287	/	1,287	0	/	0	738	/	637	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	58	206	0	0	177	88	0	0	0	86	2	104	721
4:15 PM	55	250	0	0	188	89	0	0	0	107	5	97	791
4:30 PM	66	224	0	0	190	123	0	0	0	103	1	80	787
4:45 PM	57	251	0	0	175	97	0	0	0	116	1	96	793
5:00 PM	43	208	0	0	219	120	0	0	0	112	0	80	782
5:15 PM	48	218	0	0	194	119	0	0	0	117	1	107	804
5:30 PM	39	267	0	0	204	143	0	0	0	100	2	98	853
5:45 PM	56	220	0	0	207	110	0	0	0	110	0	100	803
VOLUMES	422	1,844	0	0	1,554	889	0	0	0	851	12	762	6,334
APPROACH %	19%	81%	0%	0%	64%	36%	0%	0%	0%	52%	1%	47%	
APP/DEPART	2,266	/	2,606	2,443	/	2,406	0	/	0	1,625	/	1,322	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	186	913	0	0	824	492	0	0	0	439	3	385	3,242
APPROACH %	17%	83%	0%	0%	63%	37%	0%	0%	0%	53%	0%	47%	
PEAK HR FACTOR		0.898			0.948			0.000			0.919		0.950
APP/DEPART	1,099	/	1,298	1,316	/	1,264	0	/	0	827	/	680	0

U-TURNS

NB	SB	EB	WB	TTL
X	X	X	X	
0	0	0	0	0
1	0	0	0	1
3	0	0	0	3
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
4	0	0	0	4
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	40
0	0	0	27
0	0	0	41
0	0	0	40
0	0	0	33
0	0	0	30
0	0	0	38
0	0	0	29
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	278
0	0	0	144
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	33
0	0	0	33
0	0	0	30
0	0	0	31
0	0	0	30
0	0	0	45
0	0	0	34
0	0	0	38
0	0	0	274
0	0	0	147



ALL PED AND BIKE

	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
7:00 AM	2	1	0	0	3
7:15 AM	1	0	0	0	1
7:30 AM	3	4	0	0	7
7:45 AM	2	0	0	0	2
8:00 AM	2	1	0	0	3
8:15 AM	3	8	0	0	11
8:30 AM	0	1	0	0	1
8:45 AM	4	2	0	0	6
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
TOTAL	17	17	0	0	34
3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	0	2	0	0	2
4:15 PM	1	1	0	0	2
4:30 PM	1	4	0	0	5
4:45 PM	4	1	0	0	5
5:00 PM	2	0	0	0	2
5:15 PM	2	3	0	0	5
5:30 PM	3	5	0	1	9
5:45 PM	5	2	0	0	7
TOTAL	18	18	0	1	37

PEDESTRIAN CROSSINGS

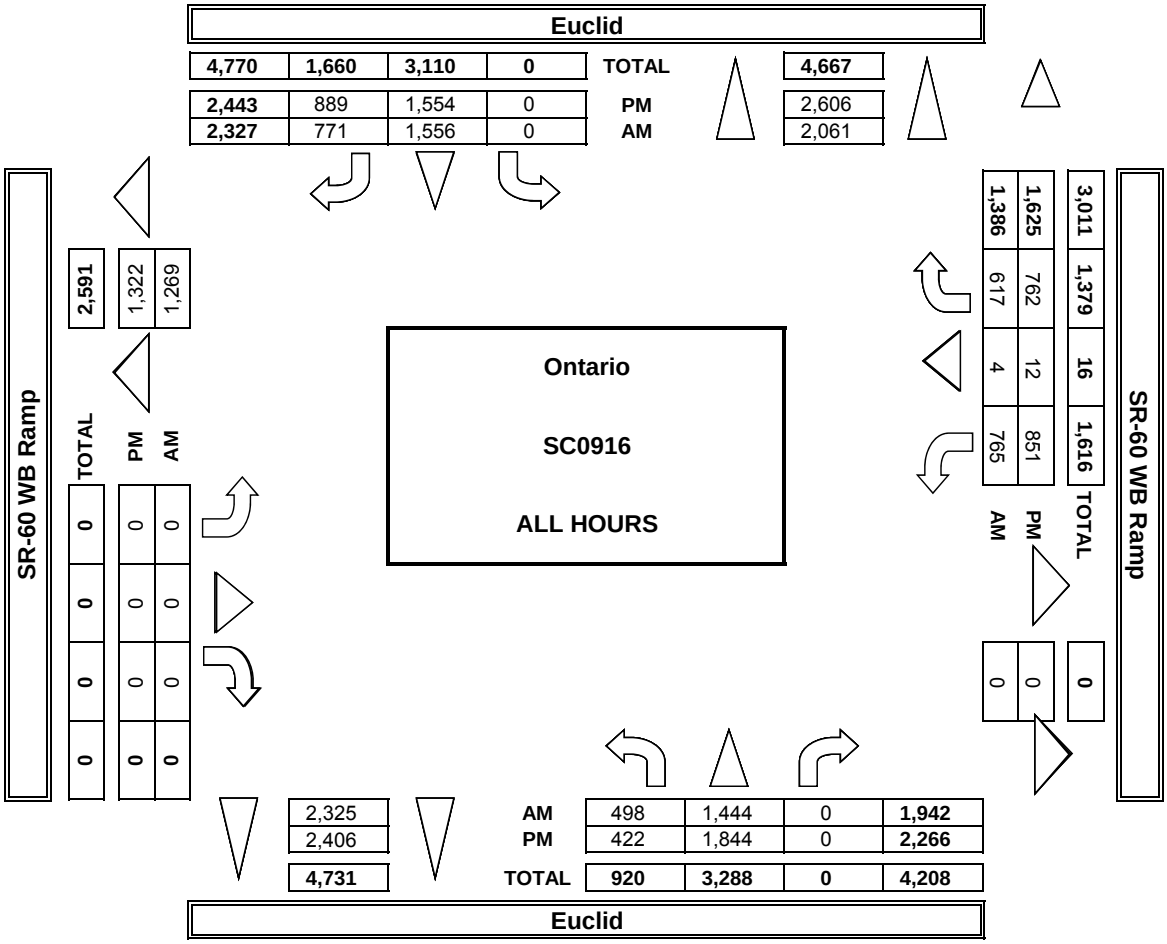
E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
2	1	0	0	3
1	0	0	0	1
3	3	0	0	6
2	0	0	0	2
2	1	0	0	3
3	7	0	0	10
0	1	0	0	1
4	2	0	0	6
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
17	15	0	0	32
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	3	0	0	3
2	1	0	0	3
2	0	0	0	2
0	2	0	0	2
3	3	0	0	6
5	2	0	0	7
12	12	0	0	24

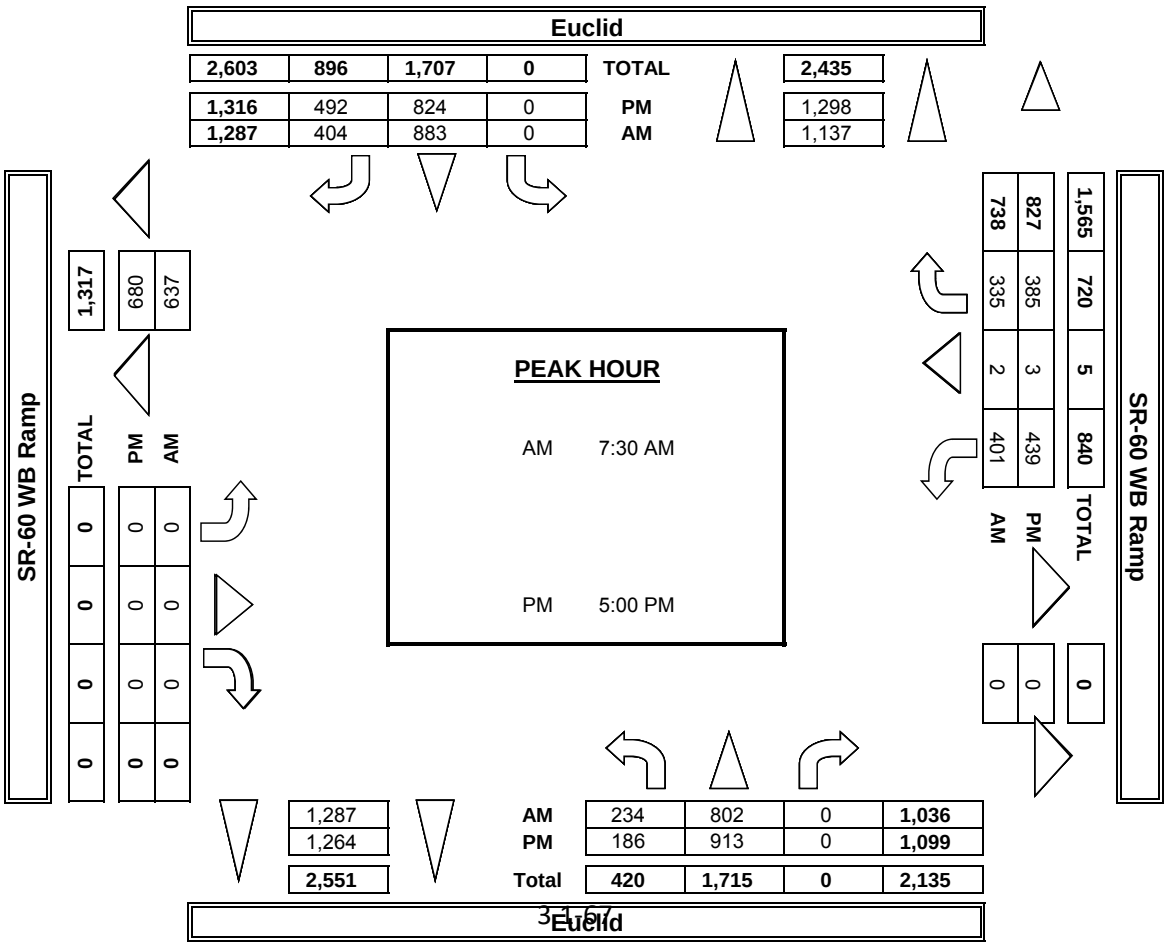
BICYCLE CROSSINGS

ES	WS	SS	NS	TOTAL
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	2	0	0	2
0	0	0	0	0
0	2	0	0	2
1	0	0	0	1
1	1	0	0	2
2	0	0	0	2
0	0	0	0	0
2	1	0	0	3
0	2	0	1	3
0	0	0	0	0
6	6	0	1	13

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	1
TUESDAY	EAST & WEST:	SR-60 WB Ramp	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS	NOTES:	AM / PM / MD / OTHER / OTHER	▲ N / ◄ W / E ► / S ▼

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND SR-60 WB Ramp			WESTBOUND SR-60 WB Ramp			
	LANES:	NL 1	NT 3	NR X	SL X	ST 2	SR 1	EL X	ET X	ER X	WL 1.3	WT 0.3	WR 1.3	TOTAL
AM	7:00 AM	3	5	0	0	10	10	0	0	0	11	0	1	40
	7:15 AM	3	8	0	0	5	8	0	0	0	8	0	2	34
	7:30 AM	2	12	0	0	19	19	0	0	0	15	0	4	71
	7:45 AM	4	11	0	0	21	9	0	0	0	11	0	2	58
	8:00 AM	4	11	0	0	20	7	0	0	0	9	0	3	54
	8:15 AM	4	16	0	0	16	9	0	0	0	10	0	2	57
	8:30 AM	5	9	0	0	14	10	0	0	0	12	0	5	55
	8:45 AM	6	11	0	0	16	9	0	0	0	10	0	2	54
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	31	83	0	0	121	81	0	0	0	86	0	21	423
	APPROACH %	27%	73%	0%	0%	60%	40%	0%	0%	0%	80%	0%	20%	
	APP/DEPART	114	/	104	202	/	207	0	/	0	107	/	112	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	14	50	0	0	76	44	0	0	0	45	0	11	240
	APPROACH %	22%	78%	0%	0%	63%	37%	0%	0%	0%	80%	0%	20%	
	PEAK HR FACTOR		0.800			0.789			0.000			0.737		0.845
	APP/DEPART	64	/	61	120	/	121	0	/	0	56	/	58	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	10	7	0	0	6	3	0	0	0	10	0	7	43
	4:15 PM	7	18	0	0	2	3	0	0	0	6	0	2	38
	4:30 PM	7	6	0	0	6	7	0	0	0	7	1	3	37
	4:45 PM	5	7	0	0	5	5	0	0	0	5	0	3	30
	5:00 PM	4	15	0	0	12	6	0	0	0	1	0	6	44
	5:15 PM	3	6	0	0	6	6	0	0	0	2	0	2	25
	5:30 PM	3	14	0	0	7	3	0	0	0	2	0	2	31
	5:45 PM	5	10	0	0	8	6	0	0	0	1	0	3	33
	VOLUMES	44	83	0	0	52	39	0	0	0	34	1	28	281
	APPROACH %	35%	65%	0%	0%	57%	43%	0%	0%	0%	54%	2%	44%	
	APP/DEPART	127	/	111	91	/	86	0	/	0	63	/	84	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	23	46	0	0	25	21	0	0	0	19	1	14	149
	APPROACH %	33%	67%	0%	0%	54%	46%	0%	0%	0%	56%	3%	41%	
	PEAK HR FACTOR		0.690			0.639			0.000			0.773		0.847
	APP/DEPART	69	/	60	46	/	44	0	/	0	34	/	45	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	1
TUESDAY	EAST & WEST:	SR-60 WB Ramp	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND SR-60 WB Ramp			WESTBOUND SR-60 WB Ramp			
	LANES:	NL 1	NT 3	NR X	SL X	ST 2	SR 1	EL X	ET X	ER X	WL 1.3	WT 0.3	WR 1.3	TOTAL
AM	7:00 AM	2	0	0	0	6	0	0	0	0	2	0	0	10
	7:15 AM	0	1	0	0	4	1	0	0	0	1	0	0	7
	7:30 AM	2	1	0	0	3	0	0	0	0	1	0	0	7
	7:45 AM	1	2	0	0	1	0	0	0	0	4	0	0	8
	8:00 AM	3	0	0	0	9	0	0	0	0	3	0	1	16
	8:15 AM	3	1	0	0	4	1	0	0	0	0	0	0	9
	8:30 AM	0	2	0	0	2	0	0	0	0	1	0	0	5
	8:45 AM	2	1	0	0	0	1	0	0	0	5	0	0	9
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	13	8	0	0	29	3	0	0	0	17	0	1	71
	APPROACH %	62%	38%	0%	0%	91%	9%	0%	0%	0%	94%	0%	6%	
	APP/DEPART	21	/	9	32	/	46	0	/	0	18	/	16	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	9	4	0	0	17	1	0	0	0	8	0	1	40
	APPROACH %	69%	31%	0%	0%	94%	6%	0%	0%	0%	89%	0%	11%	
	PEAK HR FACTOR		0.813			0.500			0.000			0.563		0.625
	APP/DEPART	13	/	5	18	/	25	0	/	0	9	/	10	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	1	0	0	0	1	0	0	0	1	0	0	3
	4:15 PM	1	2	0	0	1	0	0	0	0	2	0	0	6
	4:30 PM	1	2	0	0	1	0	0	0	0	2	0	0	6
	4:45 PM	0	1	0	0	1	0	0	0	0	4	0	0	6
	5:00 PM	0	1	0	0	1	0	0	0	0	1	0	0	3
	5:15 PM	3	0	0	0	1	0	0	0	0	2	0	0	6
	5:30 PM	0	2	0	0	0	0	0	0	0	1	0	0	3
	5:45 PM	1	2	0	0	0	0	0	0	0	2	0	0	5
	VOLUMES	6	11	0	0	5	1	0	0	0	15	0	0	38
	APPROACH %	35%	65%	0%	0%	83%	17%	0%	0%	0%	100%	0%	0%	
	APP/DEPART	17	/	11	6	/	20	0	/	0	15	/	7	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	2	6	0	0	3	1	0	0	0	9	0	0	21
	APPROACH %	25%	75%	0%	0%	75%	25%	0%	0%	0%	100%	0%	0%	
	PEAK HR FACTOR		0.667			1.000			0.000			0.563		0.875
	APP/DEPART	8	/	6	4	/	12	0	/	0	9	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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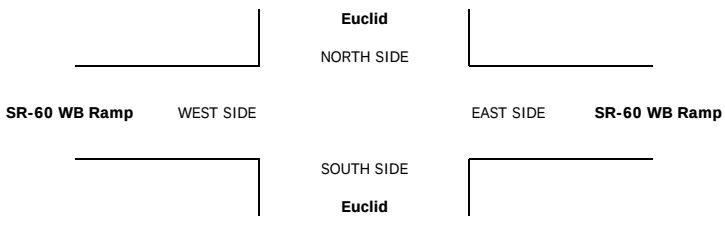
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	1
TUESDAY	EAST & WEST:	SR-60 WB Ramp	CONTROL:	SIGNAL

CLASS 4:	NOTES:
4 OR MORE AXLE TRUCKS	

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND SR-60 WB Ramp			WESTBOUND SR-60 WB Ramp			
	LANES:	NL 1	NT 3	NR X	SL X	ST 2	SR 1	EL X	ET X	ER X	WL 1.3	WT 0.3	WR 1.3	TOTAL
AM	7:00 AM	5	4	0	0	4	2	0	0	0	10	0	1	26
	7:15 AM	3	3	0	0	4	4	0	0	0	13	0	2	29
	7:30 AM	3	8	0	0	3	3	0	0	0	16	0	2	35
	7:45 AM	7	3	0	0	1	1	0	0	0	18	0	1	31
	8:00 AM	7	5	0	0	1	8	0	0	0	17	0	6	44
	8:15 AM	3	11	0	0	1	3	0	0	0	18	0	1	37
	8:30 AM	2	6	0	0	6	4	0	0	0	16	0	1	35
	8:45 AM	9	10	0	0	2	2	0	0	0	25	0	3	51
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	39	50	0	0	22	27	0	0	0	133	0	17	288
	APPROACH %	44%	56%	0%	0%	45%	55%	0%	0%	0%	89%	0%	11%	
	APP/DEPART	89	/	67	49	/	155	0	/	0	150	/	66	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	21	32	0	0	10	17	0	0	0	76	0	11	167
	APPROACH %	40%	60%	0%	0%	37%	63%	0%	0%	0%	87%	0%	13%	
	PEAK HR FACTOR		0.697			0.675			0.000			0.777		0.819
	APP/DEPART	53	/	43	27	/	86	0	/	0	87	/	38	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	5	6	0	0	0	1	0	0	0	7	0	0	19
	4:15 PM	2	5	0	0	6	1	0	0	0	9	1	0	24
	4:30 PM	3	5	0	0	0	2	0	0	0	10	0	1	21
	4:45 PM	3	0	0	0	2	3	0	0	0	7	0	2	17
	5:00 PM	1	5	0	0	2	1	0	0	0	7	0	1	17
	5:15 PM	4	4	0	0	0	4	0	0	0	10	0	1	23
	5:30 PM	0	3	0	0	3	0	0	0	0	1	0	0	7
	5:45 PM	1	4	0	0	1	2	0	0	0	9	0	2	19
	VOLUMES	19	32	0	0	14	14	0	0	0	60	1	7	147
	APPROACH %	37%	63%	0%	0%	50%	50%	0%	0%	0%	88%	1%	10%	
	APP/DEPART	51	/	39	28	/	74	0	/	0	68	/	34	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	13	16	0	0	8	7	0	0	0	33	1	3	81
	APPROACH %	45%	55%	0%	0%	53%	47%	0%	0%	0%	89%	3%	8%	
	PEAK HR FACTOR		0.659			0.536			0.000			0.841		0.844
	APP/DEPART	29	/	19	15	/	41	0	/	0	37	/	21	0

U-TURNS					
NB	SB	EB	WB	TTL	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	

RTOR			
NRR	SRR	ERR	WRR
0	0	0	1
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	4
0	0	0	2
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Euclid

NORTH SIDE

SR-60 WB Ramp WEST SIDE EAST SIDE **SR-60 WB Ramp**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

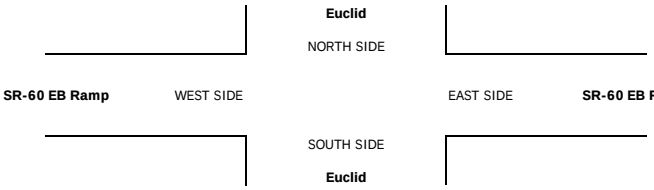
DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Euclid	LOCATION #:	2
	EAST & WEST:	SR-60 EB Ramp	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

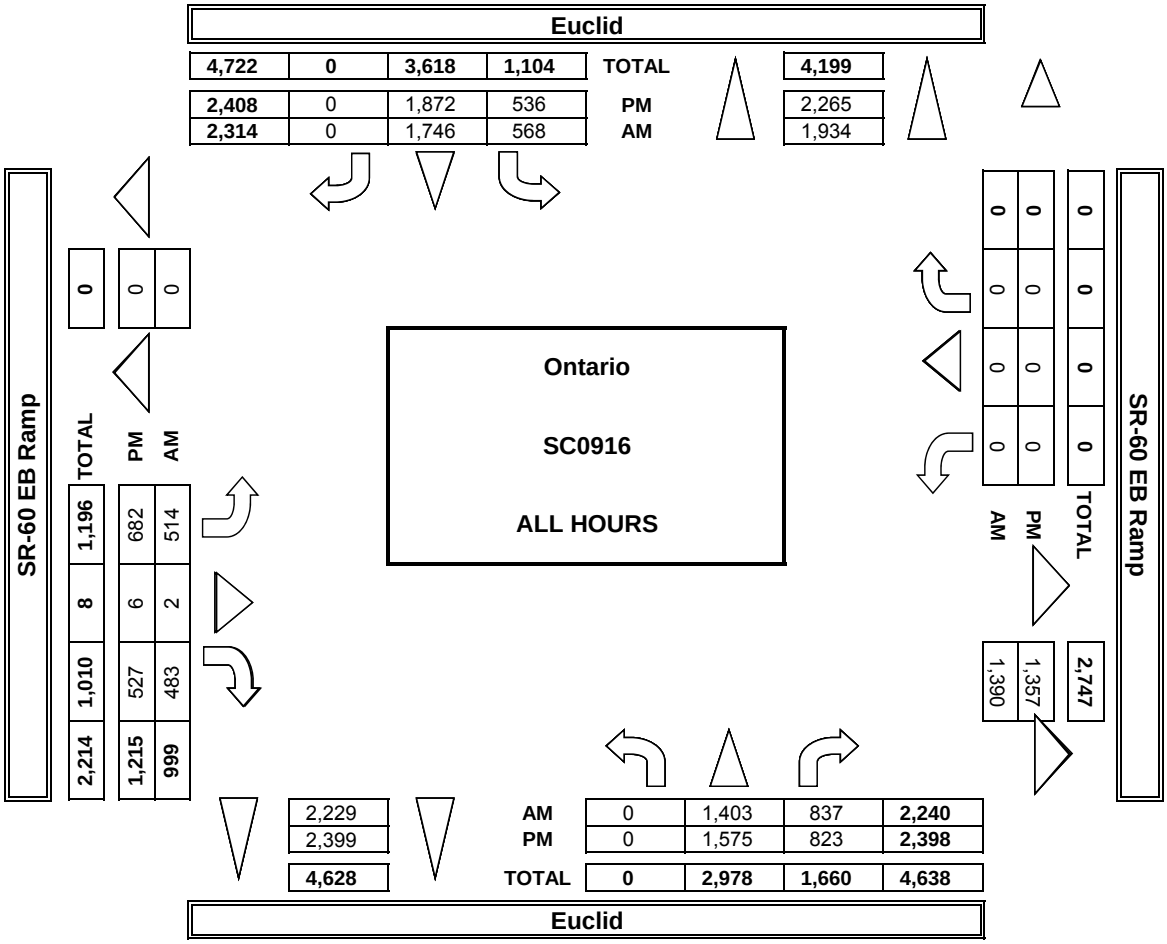
		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (SR-60 EB Ramp)			WESTBOUND (SR-60 EB Ramp)				U-TURNS					RTOR			
	LANES:	NL X	NT 2	NR 1	SL 1	ST 2	SR X	EL 1.5	ET 0	ER 0.5	WL X	WT X	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	139	127	76	174	0	50	1	63	0	0	0	630	0	1	0	0	1	0	0	16	0
	7:15 AM	0	171	136	79	199	0	63	0	50	0	0	0	698	0	1	0	0	1	0	0	15	0
	7:30 AM	0	171	91	90	230	0	51	1	29	0	0	0	663	0	1	0	0	1	0	0	14	0
	7:45 AM	0	198	85	73	218	0	71	0	45	0	0	0	690	0	2	0	0	2	0	0	9	0
	8:00 AM	0	188	90	68	288	0	78	0	50	0	0	0	762	0	2	0	0	2	0	0	16	0
	8:15 AM	0	192	74	70	247	0	73	0	76	0	0	0	732	0	4	0	0	4	0	0	25	0
	8:30 AM	0	176	133	47	189	0	60	0	88	0	0	0	693	0	3	0	0	3	0	0	28	0
	8:45 AM	0	168	101	65	201	0	68	0	82	0	0	0	685	0	3	0	0	3	0	0	28	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	1,403	837	568	1,746	0	514	2	483	0	0	0	5,553	0	17	0	0	17	0	0	151	0
	APPROACH %	0%	63%	37%	25%	75%	0%	51%	0%	48%	0%	0%	0%										
	APP/DEPART	2,240	/	1,934	2,314	/	2,229	999	/	1,390	0	/	0	0									
	BEGIN PEAK HR		7:45 AM																				
	VOLUMES	0	754	382	258	942	0	282	0	259	0	0	0	2,877						0	0	78	0
	APPROACH %	0%	66%	34%	22%	79%	0%	52%	0%	48%	0%	0%	0%										
	PEAK HR FACTOR		0.919			0.843			0.908			0.000		0.944									
	APP/DEPART	1,136	/	1,047	1,200	/	1,201	541	/	629	0	/	0	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	191	125	55	208	0	70	1	71	0	0	0	721	0	2	0	0	2	0	0	19	0
	4:15 PM	0	209	84	57	239	0	95	1	62	0	0	0	747	0	2	0	0	2	0	0	11	0
	4:30 PM	0	194	81	68	226	0	95	1	51	0	0	0	716	0	1	0	0	1	0	0	7	0
	4:45 PM	0	225	109	69	223	0	79	1	67	0	0	0	773	0	2	0	0	2	0	0	21	0
	5:00 PM	0	161	89	76	256	0	91	0	81	0	0	0	754	0	0	0	0	0	0	0	19	0
	5:15 PM	0	188	108	77	232	0	78	1	62	0	0	0	746	0	0	0	0	0	0	0	14	0
	5:30 PM	0	210	109	64	241	0	95	1	64	0	0	0	784	0	1	0	0	1	0	0	13	0
	5:45 PM	0	197	118	70	247	0	79	0	69	0	0	0	780	0	0	0	0	0	0	0	29	0
	VOLUMES	0	1,575	823	536	1,872	0	682	6	527	0	0	0	6,021	0	8	0	0	8	0	0	133	0
	APPROACH %	0%	66%	34%	22%	78%	0%	56%	0%	43%	0%	0%	0%										
	APP/DEPART	2,398	/	2,265	2,408	/	2,399	1,215	/	1,357	0	/	0	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	0	756	424	287	976	0	343	2	276	0	0	0	3,064						0	0	75	0
	APPROACH %	0%	64%	36%	23%	77%	0%	55%	0%	44%	0%	0%	0%										
	PEAK HR FACTOR		0.925			0.951			0.903			0.000		0.977									
	APP/DEPART	1,180	/	1,100	1,263	/	1,252	621	/	712	0	/	0	0									

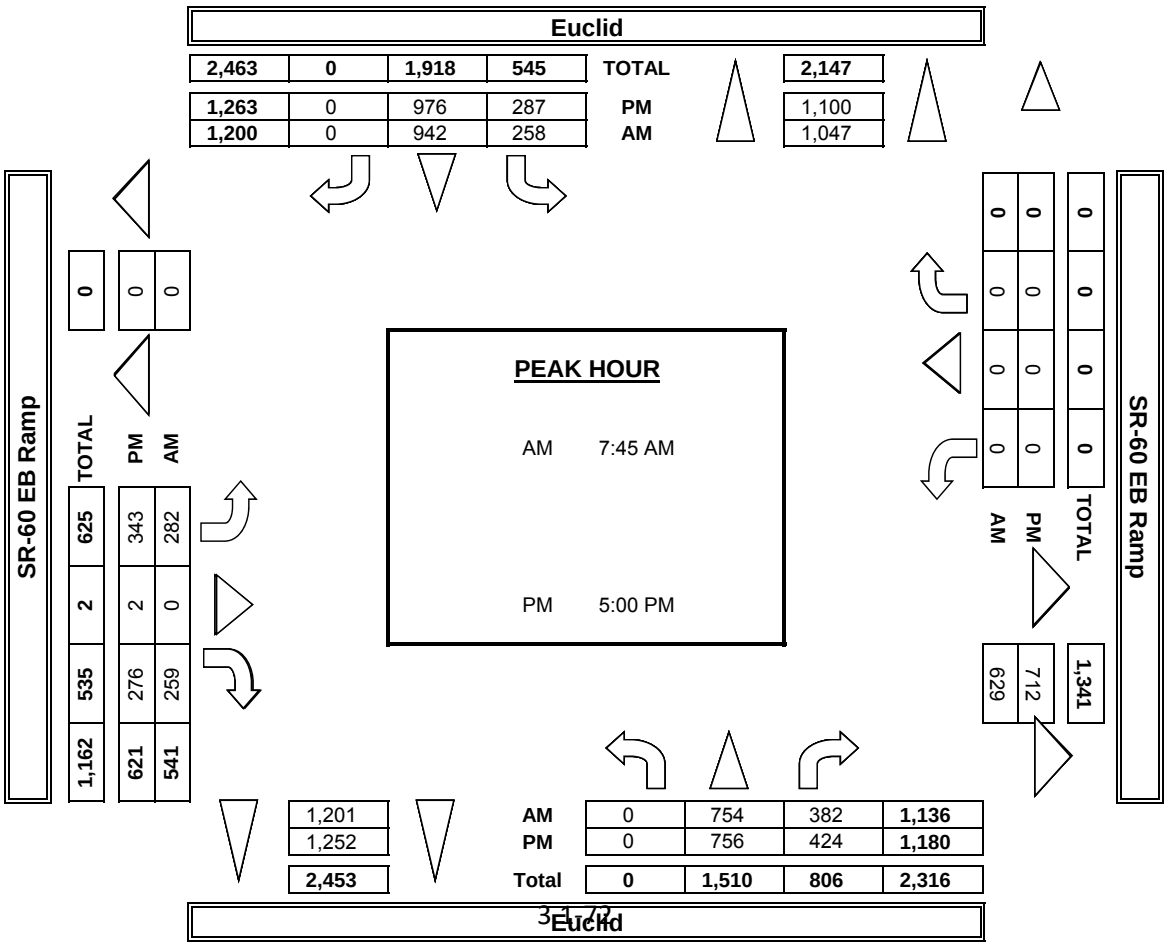


	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0
	7:15 AM	2	2	0	0	4	2	2	0	0	4	0	0	0	0	0
	7:30 AM	1	2	0	0	3	0	1	0	0	1	1	1	0	0	2
	7:45 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	8:00 AM	2	3	0	0	5	2	3	0	0	5	0	0	0	0	0
	8:15 AM	1	7	0	0	8	1	6	0	0	7	0	1	0	0	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	2	1	0	0	3	2	1	0	0	3	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	10	16	0	0	26	9	14	0	0	23	1	2	0	0	3
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	1	0	0	2	1	0	0	0	1	0	1	0	0	1
	4:15 PM	2	2	0	0	4	1	2	0	0	3	1	0	0	0	1
	4:30 PM	1	4	0	0	5	0	3	0	0	3	1	1	0	0	2
	4:45 PM	3	1	0	0	4	2	1	0	0	3	1	0	0	0	1
	5:00 PM	2	3	0	0	5	1	3	0	0	4	1	0	0	0	1
	5:15 PM	2	1	0	0	3	0	1	0	0	1	2	0	0	0	2
	5:30 PM	0	5	0	0	5	0	3	0	0	3	0	2	0	0	2
	5:45 PM	4	1	0	0	5	4	1	0	0	5	0	0	0	0	0
	TOTAL	15	18	0	0	33	9	14	0	0	23	6	4	0	0	10

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	2
TUESDAY	EAST & WEST:	SR-60 EB Ramp	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS	NOTES:	AM / PM / MD / OTHER / OTHER	▲ N / ◄ W / E ► / S ▼

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND SR-60 EB Ramp			WESTBOUND SR-60 EB Ramp			
	LANES:	NL X	NT 2	NR 1	SL 1	ST 2	SR X	EL 1.5	ET 0	ER 0.5	WL X	WT X	WR X	TOTAL
AM	7:00 AM	0	5	5	1	15	0	3	0	8	0	0	0	37
	7:15 AM	0	7	4	2	11	0	2	0	7	0	0	0	33
	7:30 AM	0	9	5	2	25	0	7	0	1	0	0	0	49
	7:45 AM	0	10	7	10	23	0	5	0	6	0	0	0	61
	8:00 AM	0	11	10	5	27	0	3	0	8	0	0	0	64
	8:15 AM	0	13	2	1	25	0	8	0	7	0	0	0	56
	8:30 AM	0	7	9	1	25	0	7	0	14	0	0	0	63
	8:45 AM	0	9	11	1	25	0	8	0	8	0	0	0	62
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	71	53	23	176	0	43	0	59	0	0	0	425
	APPROACH %	0%	57%	43%	12%	88%	0%	42%	0%	58%	0%	0%	0%	
	APP/DEPART	124	/	114	199	/	235	102	/	76	0	/	0	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	40	32	8	102	0	26	0	37	0	0	0	245
	APPROACH %	0%	56%	44%	7%	93%	0%	41%	0%	59%	0%	0%	0%	
	PEAK HR FACTOR		0.857			0.859			0.750			0.000		0.957
	APP/DEPART	72	/	66	110	/	139	63	/	40	0	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	13	7	4	7	0	3	0	9	0	0	0	43
	4:15 PM	0	15	11	1	7	0	5	0	7	0	0	0	46
	4:30 PM	0	9	6	1	12	0	4	0	3	0	0	0	35
	4:45 PM	0	7	9	1	9	0	5	0	3	0	0	0	34
	5:00 PM	0	11	6	5	8	0	8	0	8	0	0	0	46
	5:15 PM	0	6	6	4	4	0	3	1	4	0	0	0	28
	5:30 PM	0	9	9	1	8	0	8	0	8	0	0	0	43
	5:45 PM	0	8	9	1	8	0	7	0	8	0	0	0	41
	VOLUMES	0	78	63	18	63	0	43	1	50	0	0	0	316
	APPROACH %	0%	55%	45%	22%	78%	0%	46%	1%	53%	0%	0%	0%	
	APP/DEPART	141	/	121	81	/	113	94	/	82	0	/	0	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	0	42	32	8	36	0	22	0	21	0	0	0	161
	APPROACH %	0%	57%	43%	18%	82%	0%	51%	0%	49%	0%	0%	0%	
	PEAK HR FACTOR		0.712			0.846			0.672			0.000		0.875
	APP/DEPART	74	/	64	44	/	57	43	/	40	0	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	2
TUESDAY	EAST & WEST:	SR-60 EB Ramp	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (SR-60 EB Ramp)			WESTBOUND (SR-60 EB Ramp)			
	LANES:	NL X	NT 2	NR 1	SL 1	ST 2	SR X	EL 1.5	ET 0	ER 0.5	WL X	WT X	WR X	TOTAL
AM	7:00 AM	0	3	3	1	7	0	1	0	0	0	0	0	15
	7:15 AM	0	3	2	1	4	0	0	0	0	0	0	0	10
	7:30 AM	0	5	3	0	4	0	0	0	2	0	0	0	14
	7:45 AM	0	2	1	0	3	0	0	0	2	0	0	0	8
	8:00 AM	0	2	1	2	10	0	1	0	1	0	0	0	17
	8:15 AM	0	0	0	0	4	0	1	0	1	0	0	0	6
	8:30 AM	0	0	4	0	3	0	1	0	1	0	0	0	9
	8:45 AM	0	1	3	0	5	0	2	0	2	0	0	0	13
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	16	17	4	40	0	6	0	9	0	0	0	92
	APPROACH %	0%	48%	52%	9%	91%	0%	40%	0%	60%	0%	0%	0%	
	APP/DEPART	33	/	22	44	/	49	15	/	21	0	/	0	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	0	12	7	3	21	0	1	0	5	0	0	0	49
	APPROACH %	0%	63%	37%	13%	88%	0%	17%	0%	83%	0%	0%	0%	
	PEAK HR FACTOR		0.594			0.500			0.750			0.000		0.721
	APP/DEPART	19	/	13	24	/	26	6	/	10	0	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	1	3	0	3	0	0	0	1	0	0	0	8
	4:15 PM	0	2	0	0	3	0	1	0	1	0	0	0	7
	4:30 PM	0	4	1	0	3	0	0	0	0	0	0	0	8
	4:45 PM	0	2	2	0	5	0	0	0	1	0	0	0	10
	5:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	4
	5:15 PM	0	1	2	0	1	0	0	0	2	0	0	0	6
	5:30 PM	0	1	1	0	1	0	1	0	0	0	0	0	4
	5:45 PM	0	3	3	0	2	0	0	0	1	0	0	0	9
	VOLUMES	0	16	12	0	20	0	2	0	6	0	0	0	56
	APPROACH %	0%	57%	43%	0%	100%	0%	25%	0%	75%	0%	0%	0%	
	APP/DEPART	28	/	18	20	/	26	8	/	12	0	/	0	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	9	6	0	14	0	1	0	3	0	0	0	33
	APPROACH %	0%	60%	40%	0%	100%	0%	25%	0%	75%	0%	0%	0%	
	PEAK HR FACTOR		0.750			0.700			0.500			0.000		0.825
	APP/DEPART	15	/	10	14	/	17	4	/	6	0	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	2	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Euclid

NORTH SIDE

SR-60 EB Ramp WEST SIDE EAST SIDE **SR-60 EB Ramp**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	2
TUESDAY	EAST & WEST:	SR-60 EB Ramp	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND SR-60 EB Ramp			WESTBOUND SR-60 EB Ramp			
	LANES:	NL X	NT 2	NR 1	SL 1	ST 2	SR X	EL 1.5	ET 0	ER 0.5	WL X	WT X	WR X	TOTAL
AM	7:00 AM	0	6	16	1	13	0	2	1	6	0	0	0	45
	7:15 AM	0	2	20	0	17	0	3	0	4	0	0	0	46
	7:30 AM	0	7	11	1	18	0	3	0	4	0	0	0	44
	7:45 AM	0	7	12	0	19	0	2	0	3	0	0	0	43
	8:00 AM	0	11	13	1	15	0	0	0	2	0	0	0	42
	8:15 AM	0	10	21	2	17	0	5	0	6	0	0	0	61
	8:30 AM	0	2	18	2	20	0	5	0	2	0	0	0	49
	8:45 AM	0	16	14	0	23	0	4	0	3	0	0	0	60
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	61	125	7	142	0	24	1	30	0	0	0	390
	APPROACH %	0%	33%	67%	5%	95%	0%	44%	2%	55%	0%	0%	0%	
	APP/DEPART	186	/	85	149	/	172	55	/	133	0	/	0	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	39	66	5	75	0	14	0	13	0	0	0	212
	APPROACH %	0%	37%	63%	6%	94%	0%	52%	0%	48%	0%	0%	0%	
	PEAK HR FACTOR		0.847			0.870			0.614			0.000		0.869
	APP/DEPART	105	/	53	80	/	88	27	/	71	0	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	10	16	1	6	0	1	0	4	0	0	0	38
	4:15 PM	0	5	11	1	14	0	2	0	4	0	0	0	37
	4:30 PM	0	5	11	0	10	0	3	0	5	0	0	0	34
	4:45 PM	0	1	17	0	9	0	1	0	3	0	0	0	31
	5:00 PM	0	3	16	1	8	0	3	0	3	0	0	0	34
	5:15 PM	0	4	12	0	10	0	4	0	4	0	0	0	34
	5:30 PM	0	1	14	0	4	0	2	0	2	0	0	0	23
	5:45 PM	0	2	5	2	8	0	3	0	4	0	0	0	24
	VOLUMES	0	31	102	5	69	0	19	0	29	0	0	0	255
	APPROACH %	0%	23%	77%	7%	93%	0%	40%	0%	60%	0%	0%	0%	
	APP/DEPART	133	/	50	74	/	98	48	/	107	0	/	0	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	21	55	2	39	0	7	0	16	0	0	0	140
	APPROACH %	0%	28%	72%	5%	95%	0%	30%	0%	70%	0%	0%	0%	
	PEAK HR FACTOR		0.731			0.683			0.719			0.000		0.921
	APP/DEPART	76	/	28	41	/	55	23	/	57	0	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Euclid
EAST & WEST: Walnut

PROJECT #: SC0916
LOCATION #: 3
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Walnut)			WESTBOUND (Walnut)				U-TURNS					RTOR			
	LANES:	NL 1	NT 3	NR 0	SL 2	ST 3	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	11	166	6	23	175	10	39	47	17	26	125	60	705	1	11	0	0	12	3	5	5	12
	7:15 AM	27	195	7	26	212	14	47	108	25	20	95	50	826	0	7	0	0	7	2	12	6	10
	7:30 AM	20	200	15	35	201	13	37	94	17	22	78	42	774	1	8	0	0	9	8	5	5	7
	7:45 AM	35	225	11	27	205	15	29	64	24	24	74	38	771	3	12	0	0	15	2	7	4	9
	8:00 AM	16	200	12	61	255	12	28	57	24	11	51	36	763	0	25	0	0	25	6	4	6	5
	8:15 AM	13	210	15	46	264	15	16	56	22	13	57	44	771	4	17	0	0	21	5	5	7	11
	8:30 AM	11	168	13	47	224	10	32	61	18	18	56	53	711	1	18	0	0	19	5	6	4	7
	8:45 AM	21	215	8	44	232	13	32	39	27	25	42	27	725	0	16	0	0	16	2	3	10	10
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	154	1,579	87	309	1,768	102	260	526	174	159	578	350	6,046	10	114	0	0	124	33	47	47	71
	APPROACH %	8%	87%	5%	14%	81%	5%	27%	55%	18%	15%	53%	32%										
	APP/DEPART	1,820	/	2,303	2,179	/	2,111	960	/	808	1,087	/	824	0									
	BEGIN PEAK HR		7:15 AM																				
	VOLUMES	98	820	45	149	873	54	141	323	90	77	298	166	3,134						18	28	21	31
	APPROACH %	10%	85%	5%	14%	81%	5%	25%	58%	16%	14%	55%	31%										
	PEAK HR FACTOR		0.888			0.820			0.769			0.820		0.949									
	APP/DEPART	963	/	1,179	1,076	/	1,044	554	/	465	541	/	446	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	24	218	12	80	159	24	34	76	30	18	49	23	747	0	25	0	0	25	7	11	5	6
	4:15 PM	24	240	21	81	201	30	27	65	19	13	46	29	796	0	25	0	0	25	7	8	1	5
	4:30 PM	29	199	10	49	191	20	33	82	16	27	48	35	739	2	10	0	0	12	4	7	3	9
	4:45 PM	28	263	10	58	178	33	25	94	37	7	58	38	829	1	13	0	0	14	5	14	9	9
	5:00 PM	18	190	19	79	190	37	35	66	29	22	63	24	772	0	26	0	1	27	7	17	4	3
	5:15 PM	42	216	12	85	216	33	25	77	25	25	61	23	840	1	24	0	0	25	4	14	10	7
	5:30 PM	24	235	12	67	182	22	23	86	43	21	79	30	824	1	13	0	0	14	6	12	6	1
	5:45 PM	33	248	12	76	229	36	29	64	21	18	60	36	862	3	20	0	0	23	5	14	10	9
	VOLUMES	222	1,809	108	575	1,546	235	231	610	220	151	464	238	6,409	8	156	0	1	165	45	97	48	49
	APPROACH %	10%	85%	5%	24%	66%	10%	22%	57%	21%	18%	54%	28%										
	APP/DEPART	2,139	/	2,434	2,356	/	1,924	1,061	/	1,138	853	/	913	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	117	889	55	307	817	128	112	293	118	86	263	113	3,298						22	57	30	20
	APPROACH %	11%	84%	5%	25%	65%	10%	21%	56%	23%	19%	57%	24%										
	PEAK HR FACTOR		0.905			0.918			0.860			0.888		0.956									
	APP/DEPART	1,061	/	1,197	1,252	/	1,025	523	/	573	462	/	503	0									

Euclid

NORTH SIDE

Walnut WEST SIDE EAST SIDE **Walnut**

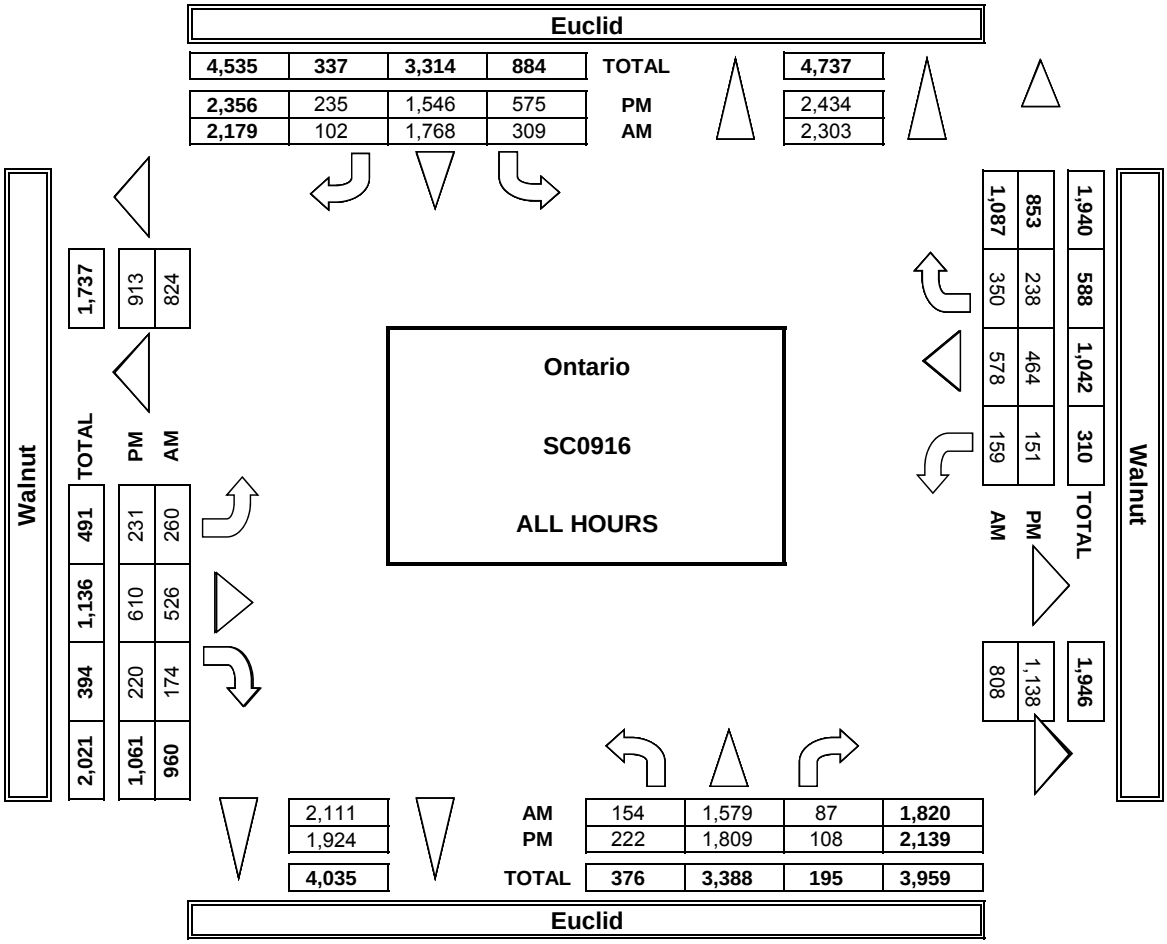
SOUTH SIDE

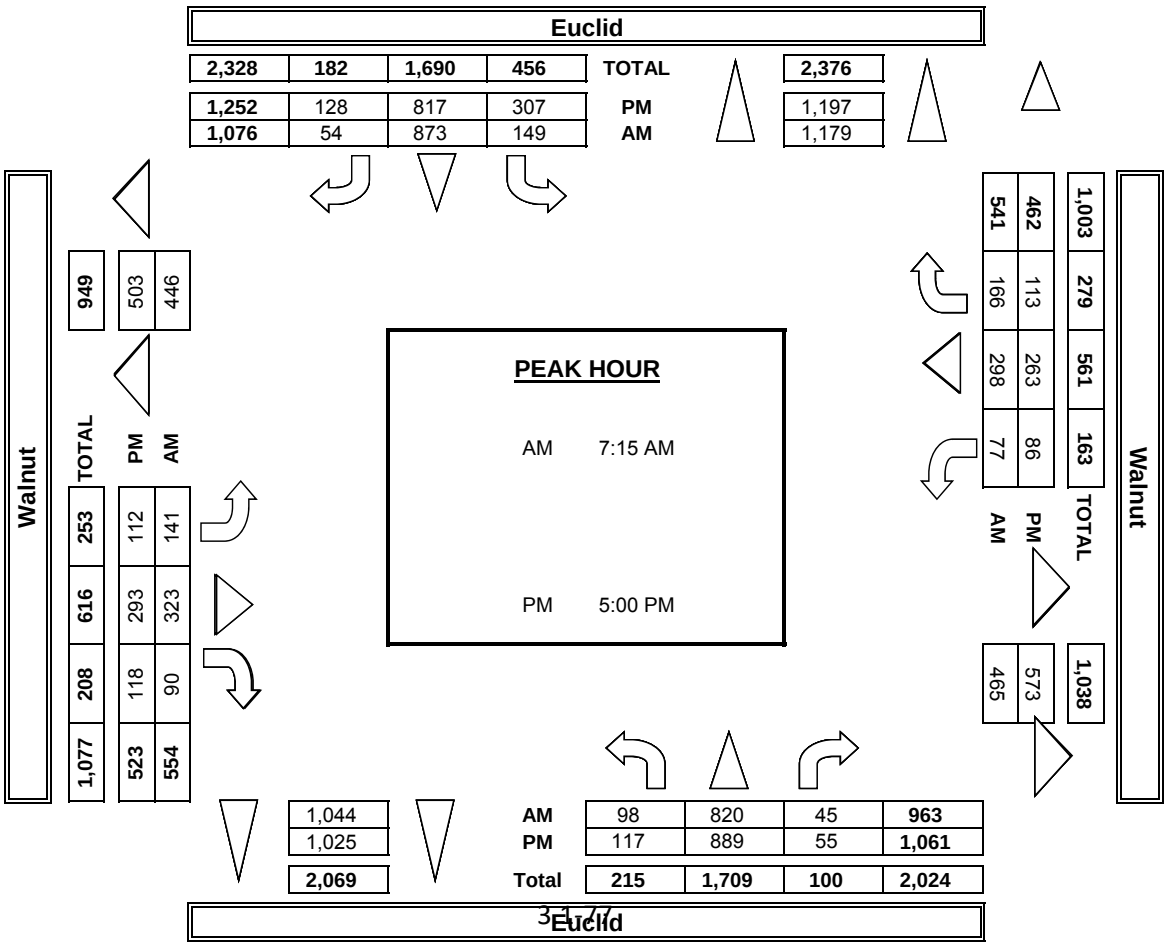
Euclid

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	1	2	4	7	0	0	1	4	5	0	1	1	0	2
	7:15 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	7:30 AM	0	1	1	2	4	0	1	1	2	4	0	0	0	0	0
	7:45 AM	0	1	0	1	2	0	1	0	1	2	0	0	0	0	0
	8:00 AM	0	0	0	2	2	0	0	0	1	1	0	0	0	1	1
	8:15 AM	1	1	1	1	4	1	0	0	1	2	0	1	1	0	2
	8:30 AM	0	4	6	3	13	0	4	6	3	13	0	0	0	0	0
	8:45 AM	1	0	1	3	5	1	0	1	3	5	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	2	8	11	17	38	2	6	9	16	33	0	2	2	1	5
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	2	2	5	10	1	0	0	3	4	0	2	2	2	6
	4:15 PM	0	1	0	6	7	0	0	0	3	3	0	1	0	3	4
	4:30 PM	2	1	2	2	7	0	1	0	1	2	2	0	2	1	5
	4:45 PM	3	0	2	2	7	1	0	1	1	3	2	0	1	1	4
	5:00 PM	1	1	0	2	4	0	1	0	2	3	1	0	0	0	1
	5:15 PM	3	3	1	5	12	1	3	0	5	9	2	0	1	0	3
	5:30 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:45 PM	0	0	2	3	5	0	0	1	3	4	0	0	1	0	1
	TOTAL	10	8	10	25	53	3	5	3	18	29	7	3	7	7	24

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	3
TUESDAY	EAST & WEST:	Walnut	CONTROL:	SIGNAL

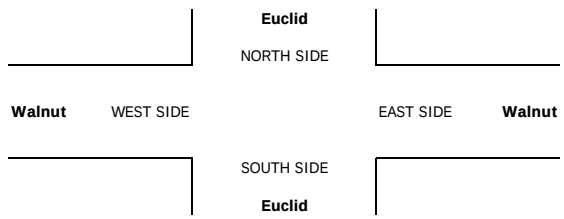
CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Walnut)			WESTBOUND (Walnut)			
	LANES:	NL 1	NT 3	NR 0	SL 2	ST 3	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
AM	7:00 AM	0	8	0	1	19	0	0	1	2	1	4	2	38
	7:15 AM	1	10	0	0	24	0	1	5	3	0	0	3	47
	7:30 AM	1	6	0	0	24	0	2	3	0	1	2	1	40
	7:45 AM	1	16	0	2	22	2	5	2	4	1	4	0	59
	8:00 AM	2	11	2	2	24	0	0	2	1	0	0	0	44
	8:15 AM	0	17	0	0	27	1	1	0	2	2	1	1	52
	8:30 AM	1	11	1	1	39	1	1	1	0	1	1	1	59
	8:45 AM	3	13	1	3	22	1	0	3	6	2	2	0	56
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	9	92	4	9	201	5	10	17	18	8	14	8	395
	APPROACH %	9%	88%	4%	4%	93%	2%	22%	38%	40%	27%	47%	27%	
	APP/DEPART	105	/	115	215	/	228	45	/	25	30	/	27	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	4	55	3	2	112	4	7	5	7	4	6	2	215
	APPROACH %	6%	87%	5%	2%	93%	3%	37%	26%	37%	33%	50%	17%	
	PEAK HR FACTOR		0.926			0.738			0.432			0.600		0.911
	APP/DEPART	63	/	67	121	/	124	19	/	10	12	/	14	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	3	13	0	1	18	0	2	2	5	0	1	1	46
	4:15 PM	3	18	1	3	14	1	2	5	2	2	1	0	52
	4:30 PM	0	13	0	2	13	0	0	6	2	3	0	0	39
	4:45 PM	2	21	0	1	12	3	0	6	2	0	2	3	52
	5:00 PM	0	17	0	3	6	0	5	7	5	1	2	1	47
	5:15 PM	4	11	0	1	10	1	0	2	0	0	4	1	34
	5:30 PM	2	11	1	0	10	0	1	6	6	1	1	2	41
	5:45 PM	1	15	0	2	12	0	0	6	3	1	2	1	43
	VOLUMES	15	119	2	13	95	5	10	40	25	8	13	9	354
	APPROACH %	11%	88%	1%	12%	84%	4%	13%	53%	33%	27%	43%	30%	
	APP/DEPART	136	/	139	113	/	128	75	/	54	30	/	33	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	5	69	1	8	45	4	7	24	11	6	5	4	190
	APPROACH %	7%	92%	1%	14%	78%	7%	17%	57%	26%	40%	33%	27%	
	PEAK HR FACTOR		0.815			0.806			0.618			0.750		0.913
	APP/DEPART	75	/	81	58	/	62	42	/	33	15	/	14	0

U-TURNS					RTOR			
NB	SB	EB	WB	TTL	NRR	SRR	ERR	WRR
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	1	0
0	0	0	0	0	0	0	0	0
1	2	0	0	3	0	1	1	0
0	1	0	0	1	0	0	0	0
0	0	0	0	0	0	1	0	1
0	0	0	0	0	1	1	0	0
0	2	0	0	2	0	0	1	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1	5	0	0	6	1	3	4	2
					1	3	1	1
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	1	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	2	2	1
0	0	0	0	0	0	0	2	0
0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	2	0
0	1	0	0	1	0	3	8	1
					0	2	4	1



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	3
TUESDAY	EAST & WEST:	Walnut	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Walnut)			WESTBOUND (Walnut)			
LANES:	NL 1	NT 3	NR 0	SL 2	ST 3	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	0	2	0	0	4	0	0	0	0	0	0	0	6
7:15 AM	0	3	0	0	5	0	0	0	0	0	0	0	8
7:30 AM	0	8	1	0	6	0	0	0	0	0	0	1	16
7:45 AM	1	6	0	0	5	0	0	0	0	0	0	0	12
8:00 AM	0	6	0	1	10	0	0	0	0	0	0	0	17
8:15 AM	0	5	0	1	7	0	0	0	0	0	0	0	13
8:30 AM	1	5	0	1	2	0	0	2	0	0	0	0	11
8:45 AM	0	6	0	0	8	0	1	0	0	0	0	0	15
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	2	41	1	3	47	0	1	2	0	0	0	1	98
APPROACH %	5%	93%	2%	6%	94%	0%	33%	67%	0%	0%	0%	100%	
APP/DEPART	44	/	44	50	/	47	3	/	5	1	/	2	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	1	25	1	2	28	0	0	0	0	0	0	1	58
APPROACH %	4%	93%	4%	7%	93%	0%	0%	0%	0%	0%	0%	100%	
PEAK HR FACTOR		0.750			0.682			0.000			0.250		0.853
APP/DEPART	27	/	26	30	/	28	0	/	3	1	/	1	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	4	0	0	5	0	1	0	0	0	0	0	10
4:15 PM	0	3	0	1	3	0	0	0	0	0	0	0	7
4:30 PM	0	4	0	0	3	0	0	1	0	0	0	0	8
4:45 PM	0	2	0	0	5	0	0	0	0	0	0	0	7
5:00 PM	0	4	0	0	1	0	0	0	0	0	0	0	5
5:15 PM	0	2	0	0	4	0	0	0	0	0	0	0	6
5:30 PM	0	3	0	0	3	0	0	0	0	0	0	1	7
5:45 PM	0	6	0	0	4	0	0	0	0	0	0	0	10
VOLUMES	0	28	0	1	28	0	1	1	0	0	0	1	60
APPROACH %	0%	100%	0%	3%	97%	0%	50%	50%	0%	0%	0%	100%	
APP/DEPART	28	/	30	29	/	28	2	/	2	1	/	0	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	13	0	1	16	0	1	1	0	0	0	0	32
APPROACH %	0%	100%	0%	6%	94%	0%	50%	50%	0%	0%	0%	0%	
PEAK HR FACTOR		0.813			0.850			0.500			0.000		0.800
APP/DEPART	13	/	14	17	/	16	2	/	2	0	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0

1	0	0	0

0	0	0	0

Euclid

NORTH SIDE

Walnut WEST SIDE EAST SIDE **Walnut**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	3
TUESDAY	EAST & WEST:	Walnut	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

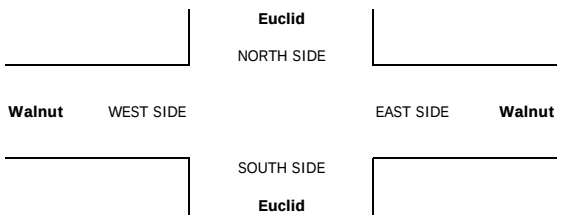
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Walnut			WESTBOUND Walnut			
LANES:	NL 1	NT 3	NR 0	SL 2	ST 3	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	0	16	0	0	16	0	0	0	0	0	1	0	33
7:15 AM	0	22	0	0	18	0	0	0	0	0	0	0	40
7:30 AM	0	14	0	0	18	0	0	0	0	1	0	0	33
7:45 AM	0	20	0	0	23	0	0	0	0	0	0	0	43
8:00 AM	0	24	0	0	20	0	0	0	0	0	0	0	44
8:15 AM	0	28	0	1	20	0	1	0	1	0	0	0	51
8:30 AM	0	12	0	0	23	0	0	0	1	0	0	0	36
8:45 AM	0	33	0	0	28	0	0	0	0	0	0	0	61
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	169	0	1	166	0	1	0	2	1	1	0	341
APPROACH %	0%	100%	0%	1%	99%	0%	33%	0%	67%	50%	50%	0%	
APP/DEPART	169	/	171	167	/	169	3	/	0	2	/	1	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	97	0	1	91	0	1	0	2	0	0	0	192
APPROACH %	0%	100%	0%	1%	98%	0%	33%	0%	67%	0%	0%	0%	
PEAK HR FACTOR		0.735			0.830			0.375			0.000		0.787
APP/DEPART	97	/	99	93	/	93	3	/	1	0	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	22	0	0	10	0	0	0	0	0	1	0	33
4:15 PM	0	13	0	0	14	1	1	0	0	0	0	1	30
4:30 PM	0	16	0	0	15	0	0	1	0	0	0	0	32
4:45 PM	0	17	0	0	11	0	0	0	1	0	0	0	29
5:00 PM	0	17	0	0	12	0	0	0	0	0	0	1	30
5:15 PM	0	14	0	0	15	0	0	0	0	0	0	0	29
5:30 PM	0	14	0	0	6	0	0	0	0	0	0	0	20
5:45 PM	0	9	0	0	13	0	0	0	0	0	0	0	22
VOLUMES	0	122	0	0	96	1	1	1	1	0	1	2	225
APPROACH %	0%	100%	0%	0%	99%	1%	33%	33%	33%	0%	33%	67%	
APP/DEPART	122	/	125	97	/	97	3	/	1	3	/	2	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	68	0	0	50	1	1	1	1	0	1	1	124
APPROACH %	0%	100%	0%	0%	98%	2%	33%	33%	33%	0%	50%	50%	
PEAK HR FACTOR		0.773			0.850			0.750			0.500		0.939
APP/DEPART	68	/	70	51	/	51	3	/	1	2	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Euclid	LOCATION #:	4
	EAST & WEST:	Riverside	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Riverside)			WESTBOUND (Riverside)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 0	WL 1	WT 2	WR 0	TOTAL
AM	7:00 AM	7	149	25	27	174	28	24	57	7	37	106	7	648
	7:15 AM	12	141	36	36	147	29	35	95	5	25	101	8	670
	7:30 AM	13	197	36	20	183	24	39	113	12	39	102	16	794
	7:45 AM	11	186	37	36	188	35	31	77	9	49	85	8	752
	8:00 AM	12	187	31	46	196	38	25	57	10	35	78	9	724
	8:15 AM	20	141	55	64	199	33	30	59	14	37	98	9	759
	8:30 AM	7	156	34	56	139	36	43	92	19	27	70	7	686
	8:45 AM	19	161	43	71	170	34	21	72	10	30	81	15	727
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	101	1,318	297	356	1,396	257	248	622	86	279	721	79	5,760
	APPROACH %	6%	77%	17%	18%	69%	13%	26%	65%	9%	26%	67%	7%	
	APP/DEPART	1,716	/	1,685	2,009	/	1,762	956	/	1,235	1,079	/	1,078	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	56	711	159	166	766	130	125	306	45	160	363	42	3,029
	APPROACH %	6%	77%	17%	16%	72%	12%	26%	64%	9%	28%	64%	7%	
	PEAK HR FACTOR		0.941			0.897			0.726			0.900		0.954
	APP/DEPART	926	/	894	1,062	/	972	476	/	615	565	/	548	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	20	208	44	15	123	25	30	114	16	33	81	12	721
	4:15 PM	18	187	67	30	150	29	32	82	19	34	69	10	727
	4:30 PM	12	208	58	28	161	50	25	85	16	33	61	13	750
	4:45 PM	19	243	57	22	159	32	28	68	18	25	85	5	761
	5:00 PM	17	143	59	32	153	28	31	94	11	41	81	12	702
	5:15 PM	13	219	70	23	184	44	37	91	9	50	83	12	835
	5:30 PM	19	203	56	28	160	34	41	87	15	30	87	12	772
	5:45 PM	17	206	56	35	167	47	27	85	21	42	70	15	788
	VOLUMES	135	1,617	467	213	1,257	289	251	706	125	288	617	91	6,056
	APPROACH %	6%	73%	21%	12%	71%	16%	23%	65%	12%	29%	62%	9%	
	APP/DEPART	2,219	/	2,009	1,759	/	1,674	1,082	/	1,336	996	/	1,037	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	66	771	241	118	664	153	136	357	56	163	321	51	3,097
	APPROACH %	6%	72%	22%	13%	71%	16%	25%	65%	10%	30%	60%	10%	
	PEAK HR FACTOR		0.892			0.931			0.960			0.922		0.927
	APP/DEPART	1,078	/	984	935	/	883	549	/	690	535	/	540	0

U-TURNS

NB X	SB X	EB X	WB X	TTL
0	4	0	0	4
0	8	0	0	8
0	4	0	0	4
1	4	0	0	5
0	3	0	0	3
0	5	0	0	5
0	4	0	0	4
0	8	0	0	8
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	40	0	0	41
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	4	0	0	5
2	8	0	0	10
0	6	0	0	6
1	6	0	0	7
0	6	0	0	6
0	2	0	0	2
0	11	0	0	11
0	7	0	0	7
4	50	0	0	54

RTOR

NRR 0	SRR 0	ERR 0	WRR 0
10	13	3	0
25	18	4	1
22	13	7	3
23	14	4	0
12	18	3	2
20	18	8	0
20	19	10	1
16	20	8	2
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
148	133	47	9
77	63	22	5
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
28	15	8	1
24	15	14	0
26	25	6	2
32	24	13	0
35	19	4	0
32	25	5	0
29	28	9	0
26	19	14	0
232	170	73	3
122	91	32	0

Euclid

NORTH SIDE

Riverside WEST SIDE EAST SIDE **Riverside**

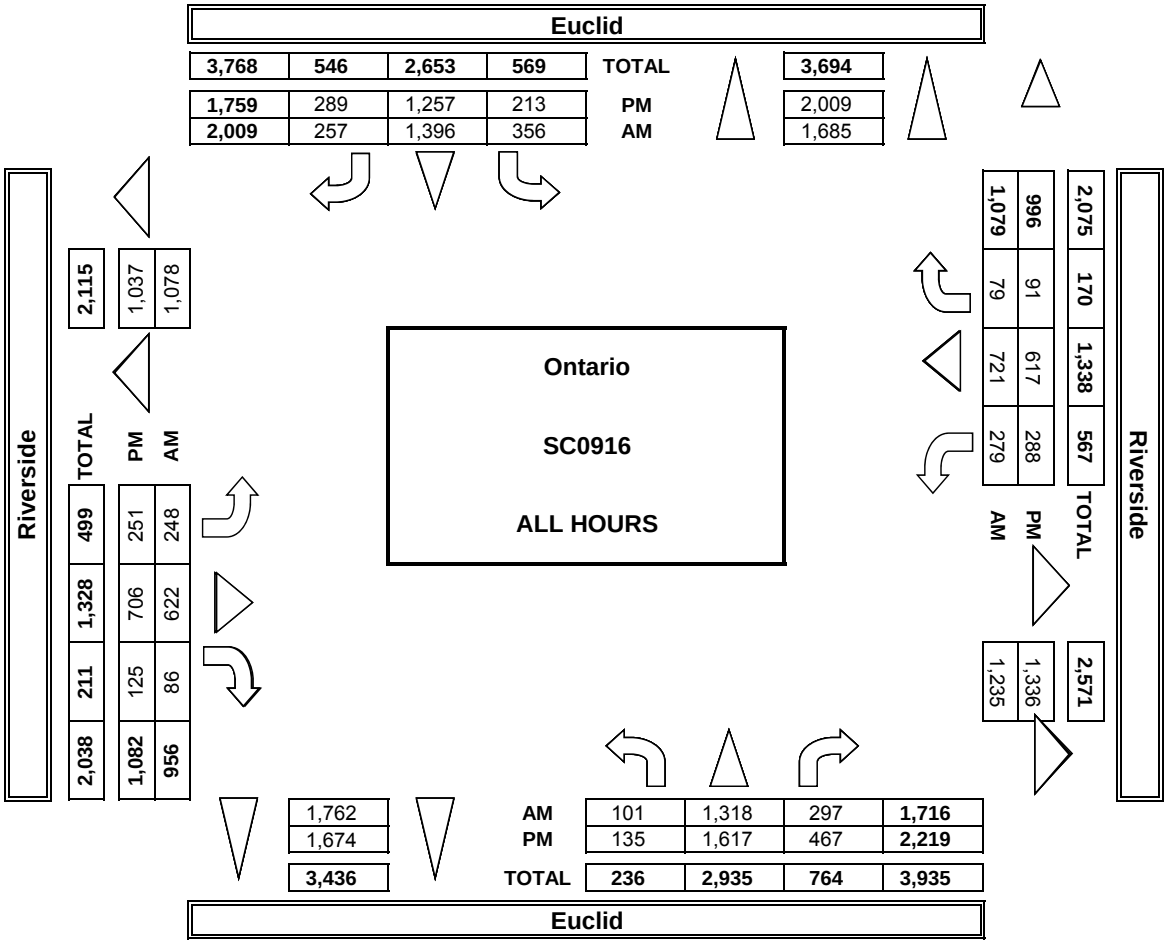
SOUTH SIDE

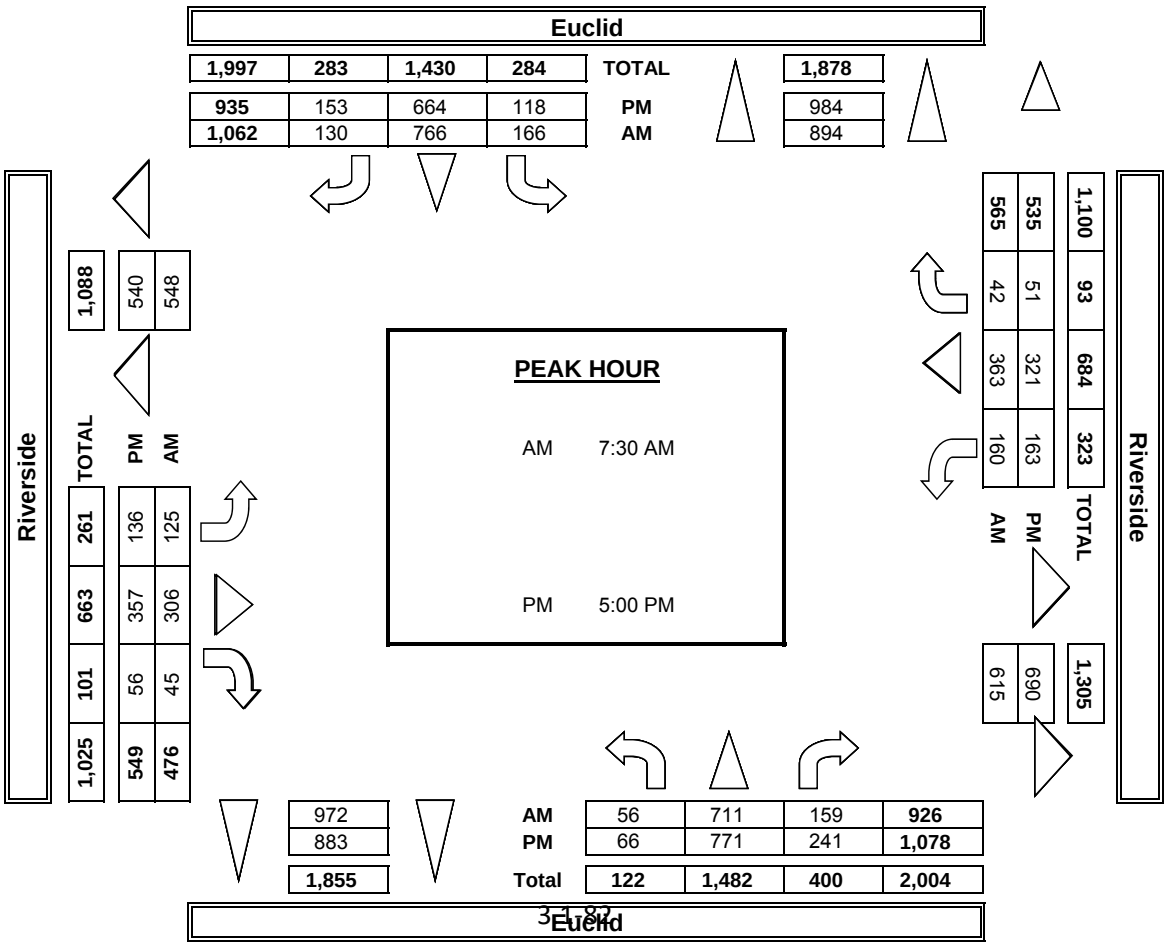
Euclid

	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM 7:00 AM	0	1	1	0	2	0	0	0	0	0	0	1	1	0	2
7:15 AM	0	1	2	0	3	0	1	2	0	3	0	0	0	0	0
7:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
7:45 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
8:30 AM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	2	7	1	10	0	1	5	1	7	0	1	2	0	3
PM 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
4:15 PM	3	2	2	0	7	0	0	0	0	0	3	2	2	0	7
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
5:00 PM	0	3	0	0	3	0	2	0	0	2	0	1	0	0	1
5:15 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	3	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	7	3	3	16	0	3	0	0	3	3	4	3	3	13

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	4
TUESDAY	EAST & WEST:	Riverside	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Riverside)			WESTBOUND (Riverside)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 0	WL 1	WT 2	WR 0	TOTAL
AM	7:00 AM	0	13	1	4	20	2	0	5	2	2	1	0	50
	7:15 AM	1	3	0	4	9	2	0	6	1	2	7	1	36
	7:30 AM	1	16	0	4	21	2	2	6	2	1	4	1	60
	7:45 AM	1	14	3	2	21	3	1	7	1	3	1	3	60
	8:00 AM	2	12	2	4	16	4	2	7	1	2	3	1	56
	8:15 AM	2	5	0	2	16	2	3	3	3	1	0	1	38
	8:30 AM	1	9	2	1	15	4	2	5	1	4	2	2	48
	8:45 AM	0	12	4	5	25	3	5	5	1	3	4	0	67
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	8	84	12	26	143	22	15	44	12	18	22	9	415
	APPROACH %	8%	81%	12%	14%	75%	12%	21%	62%	17%	37%	45%	18%	
	APP/DEPART	104	/	120	191	/	173	71	/	70	49	/	52	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	6	47	5	6	74	11	8	23	7	7	8	6	214
	APPROACH %	10%	81%	9%	6%	76%	11%	21%	61%	18%	33%	38%	29%	
	PEAK HR FACTOR		0.806			0.898			0.950			0.750		0.892
	APP/DEPART	58	/	67	97	/	88	38	/	34	21	/	25	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	2	15	2	1	10	1	0	6	0	0	8	1	46
	4:15 PM	0	16	3	2	9	0	2	7	3	1	3	1	47
	4:30 PM	2	14	4	2	11	3	0	3	1	0	2	1	43
	4:45 PM	2	17	2	0	9	1	1	3	1	2	0	0	38
	5:00 PM	3	9	1	2	2	0	3	4	1	0	3	1	29
	5:15 PM	0	10	0	1	5	0	2	5	1	0	2	0	26
	5:30 PM	0	12	2	2	4	1	0	6	1	1	2	0	31
	5:45 PM	2	11	4	2	5	2	1	5	2	0	1	0	35
	VOLUMES	11	104	18	12	55	8	9	39	10	4	21	4	295
	APPROACH %	8%	78%	14%	16%	73%	11%	16%	67%	17%	14%	72%	14%	
	APP/DEPART	133	/	121	75	/	69	58	/	65	29	/	40	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	6	62	11	3	39	5	3	19	5	3	13	3	174
	APPROACH %	8%	78%	14%	6%	80%	10%	11%	70%	19%	16%	68%	16%	
	PEAK HR FACTOR		0.940			0.766			0.563			0.528		0.926
	APP/DEPART	79	/	70	49	/	47	27	/	33	19	/	24	0

U-TURNS

NB	SB	EB	WB	TTL
0	1	0	0	1
0	1	0	0	1
0	2	0	0	2
0	1	0	0	1
0	1	0	0	1
0	2	0	0	2
0	1	0	0	1
0	3	0	0	3
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	12	0	0	12
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	1	0	0	1
0	4	0	0	4

RTOR

NRR	SRR	ERR	WRR
0	0	1	0
0	1	1	0
0	0	1	0
0	3	1	0
0	0	1	0
0	2	1	0
2	3	1	0
2	3	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
4	12	8	0
0	5	4	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	1	0	0
2	0	3	0
2	2	0	0
0	1	1	0
1	0	1	0
0	0	1	0
1	1	0	0
0	1	2	0
7	6	8	0
5	4	4	0

Euclid

NORTH SIDE

Riverside WEST SIDE EAST SIDE **Riverside**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	4
TUESDAY	EAST & WEST:	Riverside	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Riverside)			WESTBOUND (Riverside)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	0	5	0	0	2	1	1	0	0	0	0	0	9
7:15 AM	0	1	0	1	2	1	0	0	0	3	0	0	8
7:30 AM	0	9	0	0	6	0	0	2	0	1	0	0	18
7:45 AM	0	4	0	0	3	0	2	0	0	0	0	0	9
8:00 AM	0	6	1	0	9	1	0	0	0	0	0	0	17
8:15 AM	1	3	1	2	4	2	1	0	0	1	2	0	17
8:30 AM	1	3	0	0	4	0	3	0	0	0	1	0	12
8:45 AM	0	4	1	0	9	0	0	0	0	0	1	0	15
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	2	35	3	3	39	5	7	2	0	5	4	0	105
APPROACH %	5%	88%	8%	6%	83%	11%	78%	22%	0%	56%	44%	0%	
APP/DEPART	40	/	42	47	/	44	9	/	8	9	/	11	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	2	16	3	2	26	3	4	0	0	1	4	0	61
APPROACH %	10%	76%	14%	6%	84%	10%	100%	0%	0%	20%	80%	0%	
PEAK HR FACTOR		0.583			0.775			0.333			0.417		0.847
APP/DEPART	21	/	20	31	/	27	4	/	5	5	/	9	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	4	1	1	2	0	0	1	0	0	0	0	9
4:15 PM	0	3	1	0	3	0	0	1	0	0	0	0	8
4:30 PM	0	4	2	0	2	1	0	0	1	0	0	0	10
4:45 PM	0	3	0	0	4	0	0	0	0	0	1	0	8
5:00 PM	0	2	0	0	1	0	2	0	1	0	1	0	7
5:15 PM	0	2	2	0	3	0	0	0	0	1	0	0	8
5:30 PM	0	4	0	1	1	0	0	1	2	0	0	0	9
5:45 PM	0	5	0	1	2	0	0	0	0	0	0	0	8
VOLUMES	0	27	6	3	18	1	2	3	4	1	2	0	67
APPROACH %	0%	82%	18%	14%	82%	5%	22%	33%	44%	33%	67%	0%	
APP/DEPART	33	/	30	22	/	23	9	/	11	3	/	3	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	14	4	1	11	1	0	2	1	0	1	0	35
APPROACH %	0%	78%	22%	8%	85%	8%	0%	67%	33%	0%	100%	0%	
PEAK HR FACTOR		0.750			0.813			0.750			0.250		0.875
APP/DEPART	18	/	14	13	/	12	3	/	7	1	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	1	0	0	1

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
1	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	2	0	0
1	2	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	2	0
0	0	0	0
3	0	2	0
2	0	0	0

Euclid

NORTH SIDE

Riverside WEST SIDE EAST SIDE **Riverside**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	4
TUESDAY	EAST & WEST:	Riverside	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Riverside)			WESTBOUND (Riverside)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 0	WL 1	WT 2	WR 0	TOTAL
7:00 AM	0	16	0	0	20	1	1	0	1	0	0	0	39
7:15 AM	0	19	0	1	15	0	1	0	0	0	0	1	37
7:30 AM	0	19	1	0	21	0	0	1	0	2	0	0	44
7:45 AM	0	17	0	0	19	0	2	1	0	0	0	0	39
8:00 AM	0	23	0	0	25	0	1	0	0	1	0	1	51
8:15 AM	0	20	0	1	18	0	2	0	0	1	1	0	43
8:30 AM	0	19	0	2	18	2	0	0	1	0	0	0	42
8:45 AM	0	26	0	0	26	1	0	0	0	0	0	1	54
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	159	1	4	162	4	7	2	2	4	1	3	349
APPROACH %	0%	99%	1%	2%	95%	2%	64%	18%	18%	50%	13%	38%	
APP/DEPART	160	/	170	170	/	168	11	/	6	8	/	5	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	88	0	2	87	3	3	0	1	2	1	2	190
APPROACH %	0%	100%	0%	2%	94%	3%	75%	0%	25%	40%	20%	40%	
PEAK HR FACTOR		0.846			0.861			0.500			0.625		0.880
APP/DEPART	88	/	94	93	/	90	4	/	2	5	/	4	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	20	0	1	8	0	0	2	0	1	1	1	34
4:15 PM	0	11	1	0	13	0	1	0	0	0	0	0	26
4:30 PM	0	19	0	1	16	0	0	0	0	0	1	0	37
4:45 PM	0	13	0	0	11	0	2	0	0	0	0	0	26
5:00 PM	0	15	1	1	10	1	1	0	0	0	0	0	29
5:15 PM	0	18	3	0	13	0	0	0	0	0	0	0	34
5:30 PM	0	9	1	2	6	0	1	0	0	0	0	0	19
5:45 PM	1	9	2	1	11	1	0	1	0	1	0	0	27
VOLUMES	1	114	8	6	88	2	5	3	0	2	2	1	232
APPROACH %	1%	93%	7%	6%	92%	2%	63%	38%	0%	40%	40%	20%	
APP/DEPART	123	/	120	96	/	90	8	/	17	5	/	5	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	0	65	4	2	50	1	3	0	0	0	1	0	126
APPROACH %	0%	94%	6%	4%	94%	2%	100%	0%	0%	0%	100%	0%	
PEAK HR FACTOR		0.821			0.779			0.375			0.250		0.851
APP/DEPART	69	/	68	53	/	50	3	/	6	1	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	2	0	0
0	2	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
1	0	0	0
0	0	0	0
2	1	0	0
3	2	0	0
1	1	0	0

Euclid

NORTH SIDE

Riverside WEST SIDE EAST SIDE Riverside

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Euclid	LOCATION #:	5
	EAST & WEST:	Chino	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Chino)			WESTBOUND (Chino)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	7	153	11	10	188	10	12	12	11	16	41	2	473
	7:15 AM	11	202	17	4	161	14	13	31	6	22	27	1	509
	7:30 AM	5	219	39	2	211	12	23	40	10	18	39	7	625
	7:45 AM	6	212	31	9	242	22	20	25	6	17	37	9	636
	8:00 AM	17	175	25	5	194	19	27	21	12	13	35	7	550
	8:15 AM	22	191	23	6	220	29	14	31	17	6	37	6	602
	8:30 AM	10	181	18	2	158	9	22	29	8	12	21	7	477
	8:45 AM	9	196	24	8	194	10	15	14	6	12	18	3	509
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	87	1,529	188	46	1,568	125	146	203	76	116	255	42	4,381
	APPROACH %	5%	85%	10%	3%	90%	7%	34%	48%	18%	28%	62%	10%	
	APP/DEPART	1,804	/	1,722	1,739	/	1,763	425	/	432	413	/	464	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	50	797	118	22	867	82	84	117	45	54	148	29	2,413
	APPROACH %	5%	83%	12%	2%	89%	8%	34%	48%	18%	23%	64%	13%	
	PEAK HR FACTOR		0.917			0.889			0.842			0.902		0.949
	APP/DEPART	965	/	911	971	/	967	246	/	256	231	/	279	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	4	232	41	5	167	19	10	39	5	11	19	6	558
	4:15 PM	14	233	33	3	170	18	14	46	5	9	14	5	564
	4:30 PM	12	272	50	3	185	15	16	55	11	11	15	5	650
	4:45 PM	11	281	50	2	185	12	12	39	4	16	20	6	638
	5:00 PM	9	250	43	6	207	10	11	33	8	10	25	2	614
	5:15 PM	8	237	49	2	188	19	21	50	7	20	21	8	630
	5:30 PM	11	274	45	3	196	8	20	37	12	19	23	4	652
	5:45 PM	11	231	29	6	204	7	13	30	6	14	24	2	577
	VOLUMES	80	2,010	340	30	1,502	108	117	329	58	110	161	38	4,883
	APPROACH %	3%	83%	14%	2%	92%	7%	23%	65%	12%	36%	52%	12%	
	APP/DEPART	2,430	/	2,170	1,640	/	1,675	504	/	694	309	/	344	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	39	1,042	187	13	776	49	64	159	31	65	89	20	2,534
	APPROACH %	3%	82%	15%	2%	93%	6%	25%	63%	12%	37%	51%	11%	
	PEAK HR FACTOR		0.927			0.939			0.814			0.888		0.972
	APP/DEPART	1,268	/	1,128	838	/	873	254	/	357	174	/	176	0

U-TURNS

NB	SB	EB	WB	TTL
X	X	X	X	
1	2	0	0	3
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
1	0	0	0	1
0	0	0	0	0
1	0	0	0	1
0	2	0	0	2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
3	5	0	0	8
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
1	0	0	0	1
1	1	0	0	2
1	0	0	0	1
0	0	0	0	0
0	1	0	0	1
1	1	0	0	2
0	0	0	0	0
1	2	0	0	3
5	5	0	0	10

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
5	1	4	0
5	5	3	1
11	0	4	2
12	7	2	2
3	6	7	0
8	15	10	0
3	4	4	0
9	2	2	3
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
56	40	36	8
34	28	23	4
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
10	9	2	3
5	5	3	2
15	4	7	5
21	7	3	1
11	6	5	1
9	14	3	1
13	1	7	1
11	2	3	1
95	48	33	15
54	28	18	4

Euclid

NORTH SIDE

Chino WEST SIDE EAST SIDE **Chino**

SOUTH SIDE

Euclid

ALL PED AND BIKE

	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	1	0	0	1
8:15 AM	0	0	1	0	1
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
9:00 AM	0	0	0	0	0
9:15 AM	0	0	0	0	0
9:30 AM	0	0	0	0	0
9:45 AM	0	0	0	0	0
TOTAL	0	1	1	0	2
3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	0	0	0	0	0
3:45 PM	0	0	0	0	0
4:00 PM	1	0	0	0	1
4:15 PM	1	3	0	1	5
4:30 PM	0	1	0	0	1
4:45 PM	0	1	0	0	1
5:00 PM	0	1	0	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL	2	6	0	1	9

PEDESTRIAN CROSSINGS

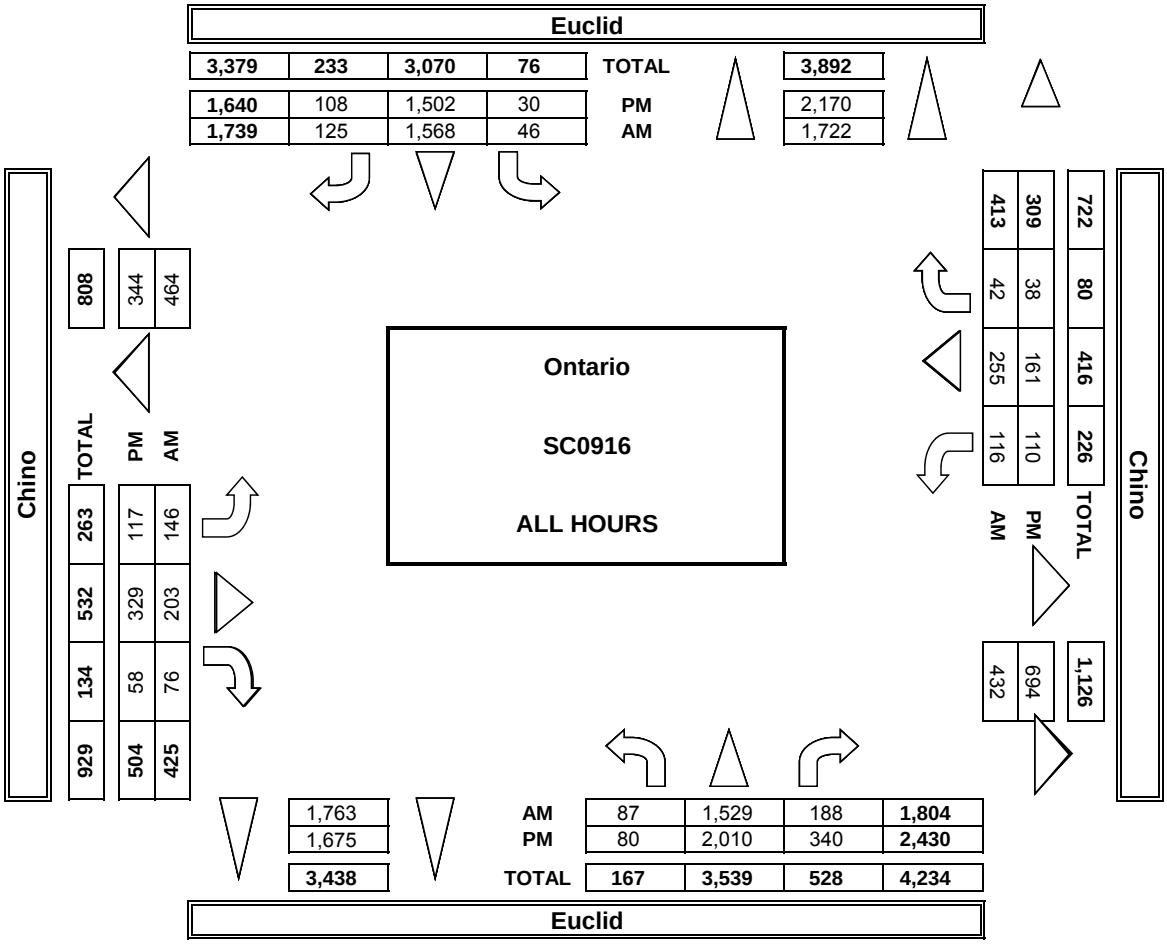
E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	1	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	1	1

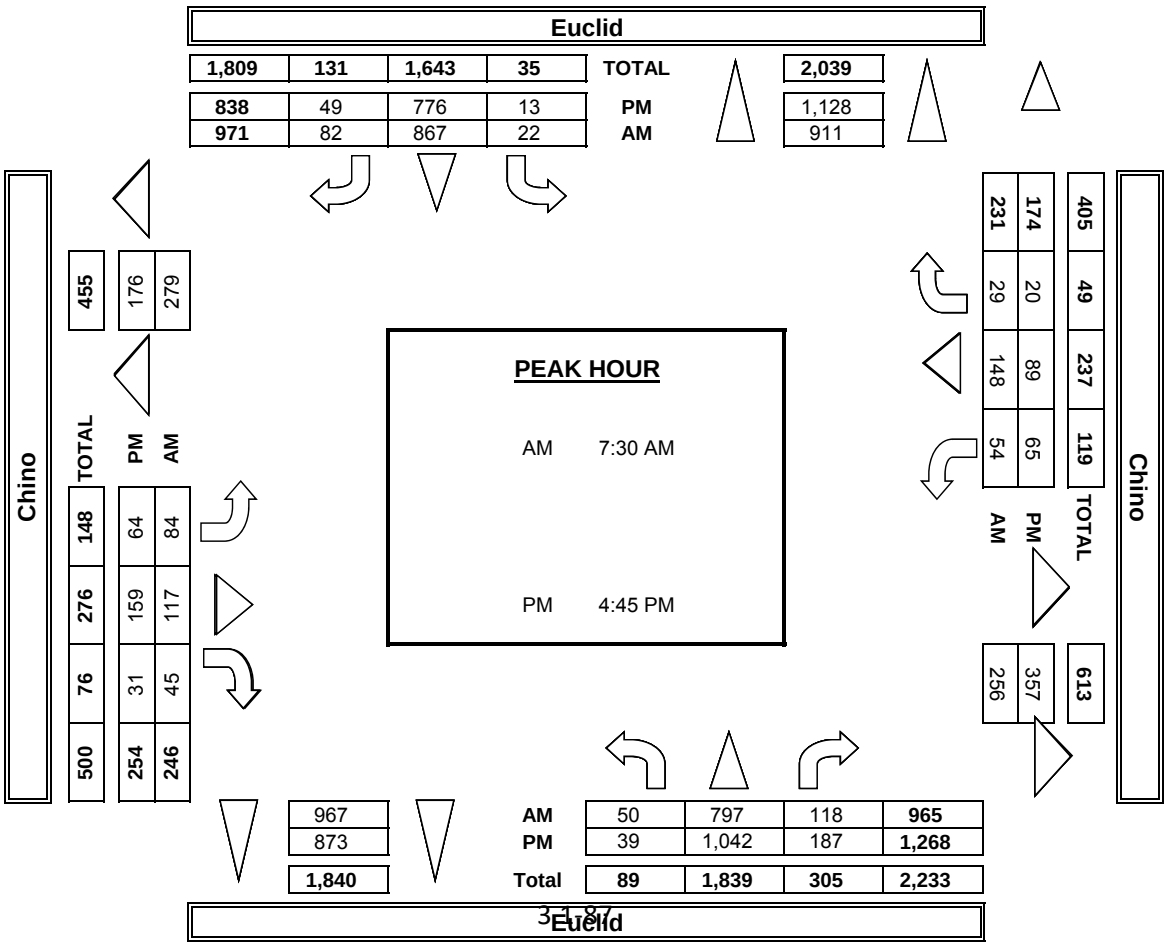
BICYCLE CROSSINGS

ES	WS	SS	NS	TOTAL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
1	3	0	0	4
0	1	0	0	1
0	1	0	0	1
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
2	6	0	0	8

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	5
TUESDAY	EAST & WEST:	Chino	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

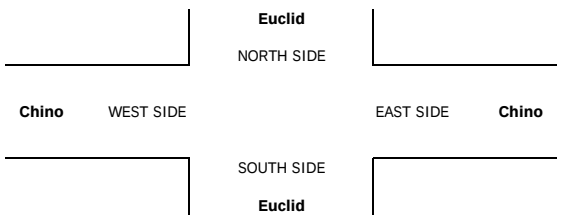
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Chino			WESTBOUND Chino			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
7:00 AM	2	16	0	1	16	0	0	2	1	0	0	0	38
7:15 AM	0	7	0	0	13	3	0	0	1	4	1	0	29
7:30 AM	1	16	2	0	17	0	0	1	0	0	2	0	39
7:45 AM	0	15	0	1	21	4	0	0	0	0	1	0	42
8:00 AM	1	10	0	0	11	2	2	0	0	0	0	1	27
8:15 AM	1	4	2	0	26	1	1	0	1	1	0	0	37
8:30 AM	0	9	2	0	15	0	1	2	0	0	2	1	32
8:45 AM	0	7	3	1	30	1	2	0	1	2	0	1	48
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	5	84	9	3	149	11	6	5	4	7	6	3	292
APPROACH %	5%	86%	9%	2%	91%	7%	40%	33%	27%	44%	38%	19%	
APP/DEPART	98	/	93	163	/	161	15	/	17	16	/	21	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	2	54	2	2	67	7	0	3	2	4	4	0	148
APPROACH %	3%	92%	3%	3%	88%	9%	0%	60%	40%	50%	50%	0%	
PEAK HR FACTOR		0.776			0.731			0.417			0.400		0.881
APP/DEPART	59	/	54	76	/	74	5	/	7	8	/	13	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	13	7	0	9	1	1	2	1	0	1	1	36
4:15 PM	1	11	1	0	11	1	1	2	0	2	0	0	30
4:30 PM	1	13	4	1	4	0	3	1	0	0	0	0	27
4:45 PM	0	15	1	0	7	2	0	5	0	0	2	2	34
5:00 PM	0	14	2	0	6	0	0	5	3	0	1	1	32
5:15 PM	0	6	2	0	4	4	1	4	0	2	0	0	23
5:30 PM	1	13	1	0	8	0	3	3	1	0	2	1	33
5:45 PM	0	15	1	0	6	0	0	4	0	0	1	0	27
VOLUMES	3	100	19	1	55	8	9	26	5	4	7	5	242
APPROACH %	2%	82%	16%	2%	86%	13%	23%	65%	13%	25%	44%	31%	
APP/DEPART	122	/	114	64	/	65	40	/	46	16	/	17	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	52	13	1	31	4	5	10	1	2	3	3	127
APPROACH %	1%	78%	19%	3%	86%	11%	31%	63%	6%	25%	38%	38%	
PEAK HR FACTOR		0.838			0.750			0.800			0.500		0.882
APP/DEPART	67	/	60	36	/	35	16	/	24	8	/	8	0

U-TURNS

NB	SB	EB	WB	TTL
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	1	0
0	2	1	0
0	0	0	0
0	1	0	0
0	1	0	0
1	1	1	0
0	0	0	0
2	0	1	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
3	5	4	1
0	3	2	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
3	1	1	1
0	0	0	0
1	0	0	0
0	0	0	1
2	0	2	0
1	3	0	0
0	0	1	1
1	0	0	0
8	4	4	3
4	1	1	2



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	5
TUESDAY	EAST & WEST:	Chino	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Chino)			WESTBOUND (Chino)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
7:00 AM	0	5	0	0	4	0	0	0	0	0	0	0	9
7:15 AM	0	3	0	0	7	0	1	0	0	1	0	0	12
7:30 AM	0	7	0	0	5	0	0	0	0	1	1	0	14
7:45 AM	0	3	0	2	6	1	0	0	0	0	0	0	12
8:00 AM	0	4	0	1	7	0	0	0	0	1	0	0	13
8:15 AM	0	3	1	0	3	0	0	0	0	0	2	1	10
8:30 AM	0	3	0	0	5	0	0	0	0	1	0	1	10
8:45 AM	0	5	0	0	7	0	1	0	0	0	0	0	13
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	33	1	3	44	1	2	0	0	4	3	2	93
APPROACH %	0%	97%	3%	6%	92%	2%	100%	0%	0%	44%	33%	22%	
APP/DEPART	34	/	37	48	/	48	2	/	4	9	/	4	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	0	17	0	3	25	1	1	0	0	3	1	0	51
APPROACH %	0%	100%	0%	10%	86%	3%	100%	0%	0%	75%	25%	0%	
PEAK HR FACTOR		0.607			0.806			0.250			0.500		0.911
APP/DEPART	17	/	18	29	/	28	1	/	3	4	/	2	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	4	1	1	2	1	0	0	0	0	0	0	9
4:15 PM	0	4	0	0	2	0	0	0	0	0	0	0	6
4:30 PM	1	4	0	0	2	0	0	0	0	0	0	0	7
4:45 PM	0	4	1	0	5	0	0	0	0	2	0	1	13
5:00 PM	0	4	0	0	2	0	0	0	0	0	0	0	6
5:15 PM	0	4	1	0	3	0	0	0	0	0	0	0	8
5:30 PM	1	3	1	0	2	0	0	0	0	0	0	0	7
5:45 PM	0	6	0	0	2	0	0	0	0	0	1	0	9
VOLUMES	2	33	4	1	20	1	0	0	0	2	1	1	65
APPROACH %	5%	85%	10%	5%	91%	5%	0%	0%	0%	50%	25%	25%	
APP/DEPART	39	/	34	22	/	22	0	/	5	4	/	4	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	16	2	1	11	1	0	0	0	2	0	1	35
APPROACH %	5%	84%	11%	8%	85%	8%	0%	0%	0%	67%	0%	33%	
PEAK HR FACTOR		0.950			0.650			0.000			0.250		0.673
APP/DEPART	19	/	17	13	/	13	0	/	3	3	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
0	0	0	0
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0	0	0	0
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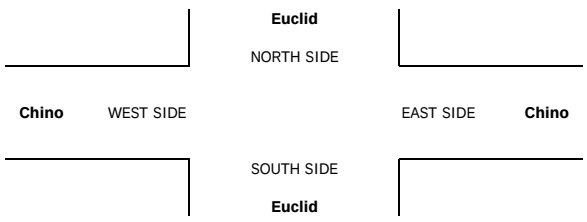
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

0	0	0	0

1	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	5
TUESDAY	EAST & WEST:	Chino	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Chino			WESTBOUND Chino			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 0	WT 1	WR 0	TOTAL
7:00 AM	1	13	0	0	16	1	0	1	1	0	1	0	34
7:15 AM	0	18	0	1	14	2	2	0	0	0	2	0	39
7:30 AM	1	19	0	0	20	1	2	0	0	0	0	2	45
7:45 AM	0	14	0	1	19	2	2	1	1	0	0	1	41
8:00 AM	0	21	3	0	23	1	0	0	0	0	0	2	50
8:15 AM	0	16	0	0	17	0	2	0	0	0	1	1	37
8:30 AM	1	17	0	0	18	0	2	0	0	0	0	0	38
8:45 AM	1	24	3	2	24	3	2	0	0	0	1	0	60
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	4	142	6	4	151	10	12	2	2	0	5	6	344
APPROACH %	3%	93%	4%	2%	92%	6%	75%	13%	13%	0%	45%	55%	
APP/DEPART	152	/	161	165	/	153	16	/	11	11	/	19	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	2	78	6	1	82	4	6	0	0	0	2	3	185
APPROACH %	2%	91%	7%	1%	93%	5%	100%	0%	0%	0%	40%	60%	
PEAK HR FACTOR		0.768			0.759			0.750			0.625		0.771
APP/DEPART	86	/	88	88	/	82	6	/	7	5	/	8	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	12	1	1	9	0	1	0	0	0	0	0	24
4:15 PM	0	11	0	0	11	0	0	0	0	1	0	0	23
4:30 PM	2	21	0	0	15	2	0	0	0	0	0	0	40
4:45 PM	0	12	0	0	11	1	0	0	0	0	1	0	25
5:00 PM	0	18	1	0	10	1	0	0	0	0	0	0	30
5:15 PM	0	20	1	0	12	0	0	1	0	0	0	0	34
5:30 PM	1	14	0	0	7	0	0	0	0	1	0	0	23
5:45 PM	1	8	0	0	13	0	4	0	0	0	2	0	28
VOLUMES	4	116	3	1	88	4	5	1	0	2	3	0	227
APPROACH %	3%	94%	2%	1%	95%	4%	83%	17%	0%	40%	60%	0%	
APP/DEPART	123	/	121	93	/	90	6	/	5	5	/	11	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	2	71	2	0	48	4	0	1	0	0	1	0	129
APPROACH %	3%	95%	3%	0%	92%	8%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.815			0.765			0.250			0.250		0.806
APP/DEPART	75	/	71	52	/	48	1	/	3	1	/	7	0

U-TURNS

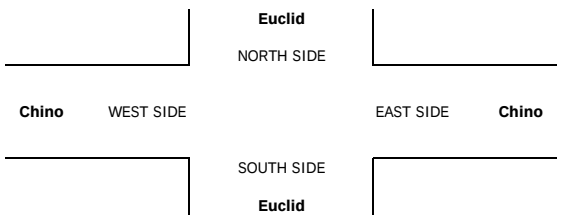
NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	1	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	1	1	1
1	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0

NRR	SRR	ERR	WRR
1	1	0	0

NRR	SRR	ERR	WRR
0	1	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

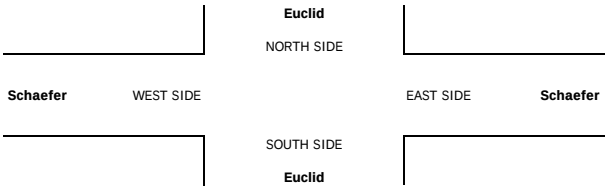
DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Euclid	LOCATION #:	6
	EAST & WEST:	Schaefer	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

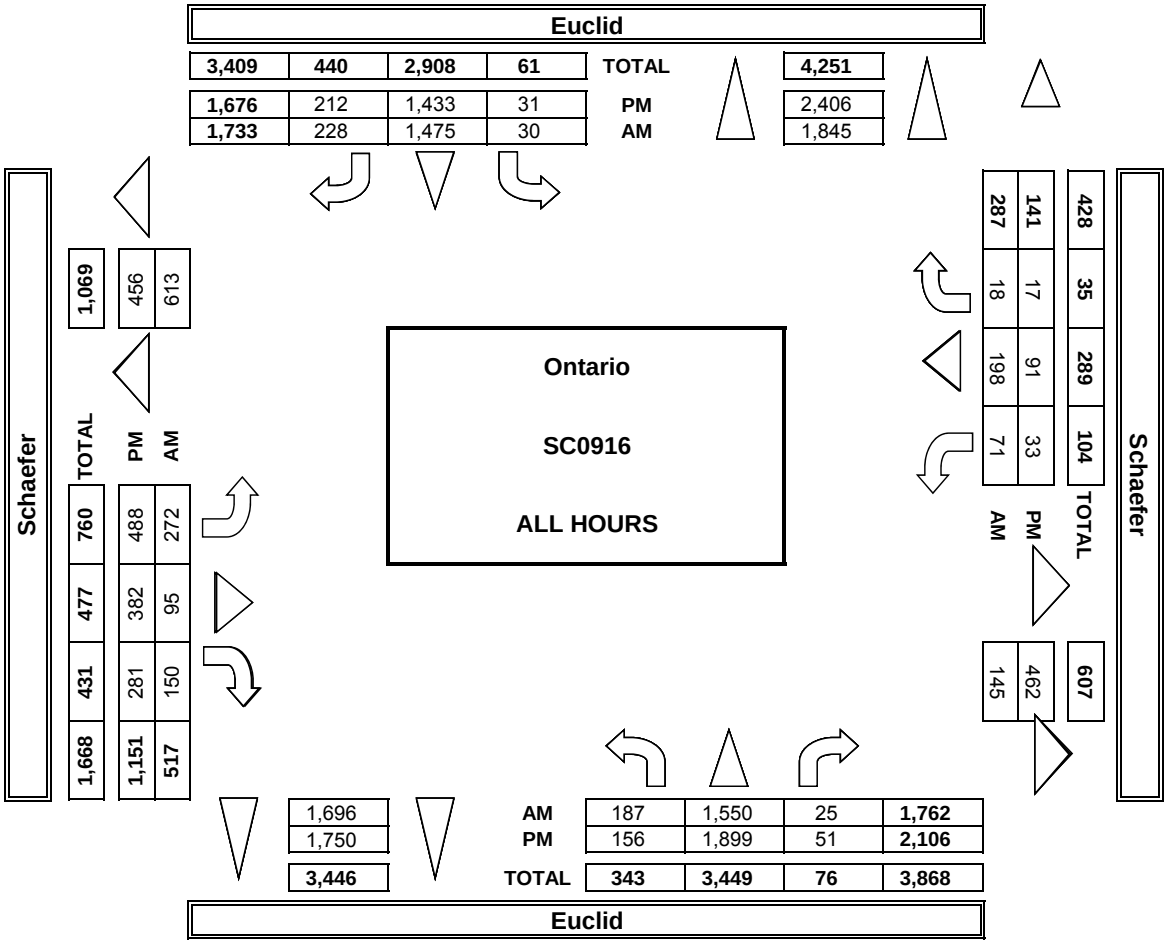
		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Schaefer)			WESTBOUND (Schaefer)				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	22	158	2	3	179	27	32	7	21	11	26	0	488	0	1	0	0	1	1	10	16	0
	7:15 AM	27	176	1	4	176	30	37	9	17	8	31	2	518	0	0	0	0	0	0	21	12	1
	7:30 AM	17	231	2	3	197	32	42	10	18	10	22	6	590	0	0	0	0	0	0	6	17	2
	7:45 AM	25	204	3	0	185	35	34	10	14	15	42	1	568	0	0	0	0	0	2	16	12	0
	8:00 AM	34	197	4	4	188	31	21	11	19	3	22	3	537	0	0	0	0	0	2	11	11	0
	8:15 AM	16	230	5	4	222	25	26	22	24	10	26	1	611	0	0	0	0	0	1	12	9	0
	8:30 AM	22	168	5	6	169	21	43	15	18	5	15	2	489	0	2	0	0	2	2	5	9	0
	8:45 AM	24	186	3	6	159	27	37	11	19	9	14	3	498	0	2	0	0	2	1	16	9	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	187	1,550	25	30	1,475	228	272	95	150	71	198	18	4,299	0	5	0	0	5	9	97	95	3
	APPROACH %	11%	88%	1%	2%	85%	13%	53%	18%	29%	25%	69%	6%										
	APP/DEPART	1,762	/	1,845	1,733	/	1,696	517	/	145	287	/	613	0									
	BEGIN PEAK HR		7:30 AM																				
	VOLUMES	92	862	14	11	792	123	123	53	75	38	112	11	2,306						5	45	49	2
	APPROACH %	10%	89%	1%	1%	86%	13%	49%	21%	30%	24%	70%	7%										
	PEAK HR FACTOR		0.964			0.922			0.872			0.694		0.944									
	APP/DEPART	968	/	996	926	/	905	251	/	78	161	/	327	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	18	170	4	4	168	21	55	38	27	8	9	2	524	1	0	0	0	1	1	6	15	0
	4:15 PM	20	233	8	7	176	18	50	45	50	2	11	2	622	0	1	0	0	1	3	5	34	0
	4:30 PM	21	255	5	7	150	22	64	60	26	3	18	2	633	0	1	0	0	1	0	14	19	0
	4:45 PM	30	264	6	2	178	29	74	58	35	2	12	4	694	0	0	0	0	0	1	12	18	3
	5:00 PM	16	226	5	6	171	32	74	45	36	8	8	1	628	0	0	0	0	0	1	14	18	0
	5:15 PM	16	252	8	0	207	26	56	58	44	4	9	4	684	2	0	0	0	2	3	10	26	1
	5:30 PM	18	257	8	4	193	38	72	48	32	5	17	1	693	0	0	0	0	0	4	15	12	1
	5:45 PM	17	242	7	1	190	26	43	30	31	1	7	1	596	0	0	0	0	0	2	6	21	1
	VOLUMES	156	1,899	51	31	1,433	212	488	382	281	33	91	17	5,074	3	2	0	0	5	15	82	163	6
	APPROACH %	7%	90%	2%	2%	86%	13%	42%	33%	24%	23%	65%	12%										
	APP/DEPART	2,106	/	2,406	1,676	/	1,750	1,151	/	462	141	/	456	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	80	999	27	12	749	125	276	209	147	19	46	10	2,699						9	51	74	5
	APPROACH %	7%	90%	2%	1%	85%	14%	44%	33%	23%	25%	61%	13%										
	PEAK HR FACTOR		0.922			0.943			0.946			0.815		0.972									
	APP/DEPART	1,106	/	1,285	886	/	917	632	/	248	75	/	249	0									

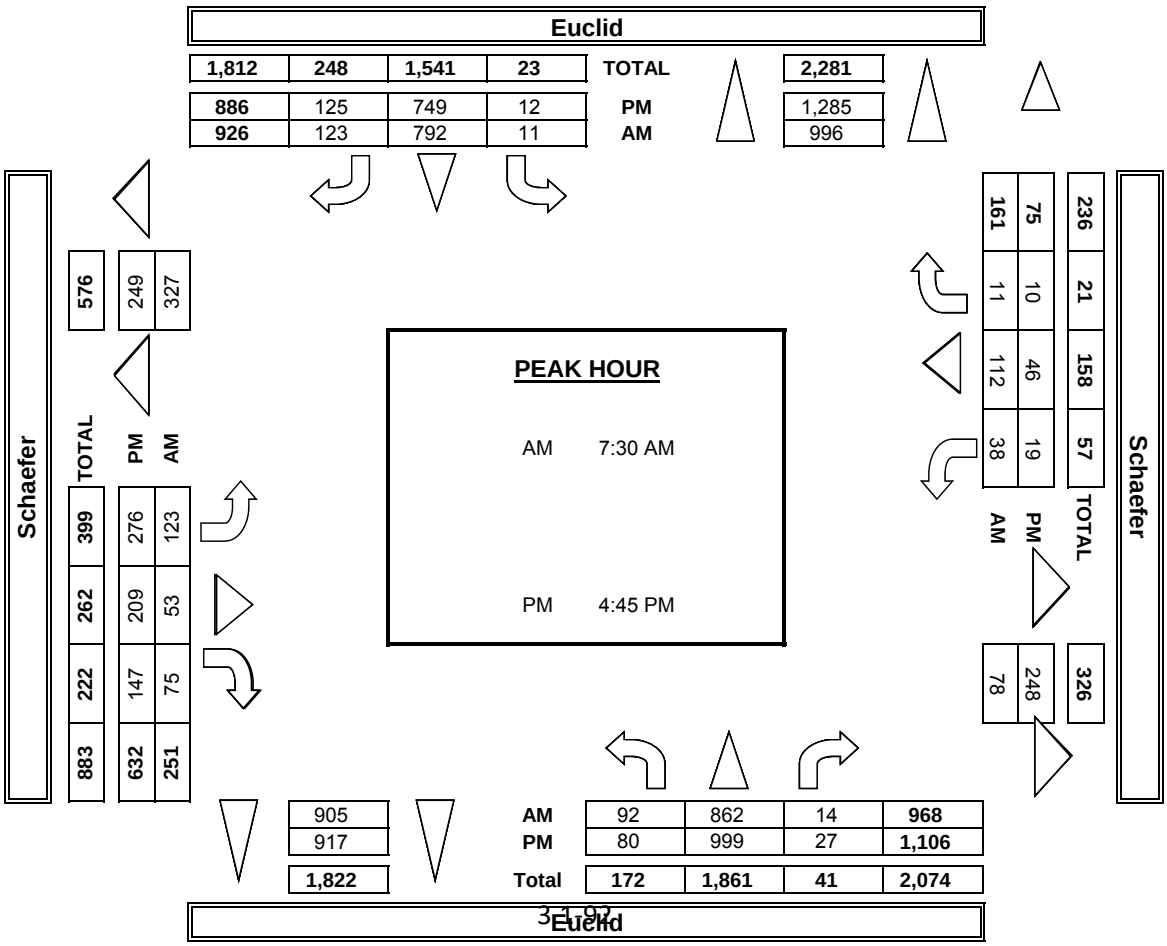


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	1	0	2	0	3	1	0	2	0	3	0	0	0	0	0
	7:30 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	8:15 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	2	4	2	0	8	1	3	2	0	6	1	1	0	0	2
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	4:15 PM	2	1	0	0	3	0	0	0	0	0	2	1	0	0	3
	4:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	4:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	5:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	5:15 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	2	5	0	1	8	0	1	0	0	1	2	4	0	1	7

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	6
TUESDAY	EAST & WEST:	Schaefer	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Schaefer)			WESTBOUND (Schaefer)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	1	10	0	0	16	0	2	0	1	0	0	0	30
	7:15 AM	3	4	0	0	15	2	0	1	1	1	1	0	28
	7:30 AM	1	12	0	1	15	1	1	0	1	1	0	1	34
	7:45 AM	0	8	0	0	15	1	0	1	2	0	1	0	28
	8:00 AM	1	12	0	0	14	3	2	2	3	0	0	0	37
	8:15 AM	1	7	0	1	23	0	1	4	1	0	0	1	39
	8:30 AM	0	11	0	0	13	0	1	2	1	1	2	1	32
	8:45 AM	0	10	0	1	27	4	3	1	2	0	2	1	51
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	7	74	0	3	138	11	10	11	12	3	6	4	279
	APPROACH %	9%	91%	0%	2%	91%	7%	30%	33%	36%	23%	46%	31%	
	APP/DEPART	81	/	88	152	/	153	33	/	14	13	/	24	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	2	40	0	2	77	7	7	9	7	1	4	3	159
	APPROACH %	5%	95%	0%	2%	90%	8%	30%	39%	30%	13%	50%	38%	
	PEAK HR FACTOR		0.808			0.672			0.821			0.500		0.779
	APP/DEPART	42	/	50	86	/	85	23	/	11	8	/	13	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	3	9	0	0	5	1	5	1	1	0	0	0	25
	4:15 PM	4	14	0	2	13	1	2	1	2	0	0	0	39
	4:30 PM	0	19	1	0	10	0	2	5	5	0	1	0	43
	4:45 PM	4	17	0	0	6	1	2	2	5	0	0	0	37
	5:00 PM	1	13	0	1	3	1	2	5	3	0	1	0	30
	5:15 PM	3	6	1	0	3	2	0	3	1	0	0	0	19
	5:30 PM	1	8	0	0	7	1	1	4	2	0	0	0	24
	5:45 PM	1	12	0	0	4	0	1	0	1	0	0	0	19
	VOLUMES	17	98	2	3	51	7	15	21	20	0	2	0	236
	APPROACH %	15%	84%	2%	5%	84%	11%	27%	38%	36%	0%	100%	0%	
	APP/DEPART	117	/	113	61	/	71	56	/	26	2	/	26	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	9	63	1	3	32	3	8	13	15	0	2	0	149
	APPROACH %	12%	86%	1%	8%	84%	8%	22%	36%	42%	0%	100%	0%	
	PEAK HR FACTOR		0.869			0.594			0.750			0.500		0.866
	APP/DEPART	73	/	71	38	/	47	36	/	17	2	/	14	0

U-TURNS					
NB	SB	EB	WB	TTL	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	6
TUESDAY	EAST & WEST:	Schaefer	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Schaefer)			WESTBOUND (Schaefer)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	0	3	0	0	5	0	2	1	1	0	0	0	12
	7:15 AM	0	1	0	0	8	0	0	1	0	0	1	0	11
	7:30 AM	0	6	1	0	5	0	1	0	0	1	0	1	15
	7:45 AM	0	3	0	0	2	0	0	0	0	0	0	0	5
	8:00 AM	1	3	0	0	8	0	0	0	0	1	0	0	13
	8:15 AM	0	4	0	0	5	0	0	1	0	0	0	0	10
	8:30 AM	0	3	0	0	7	0	0	0	0	0	0	0	10
	8:45 AM	0	5	0	0	6	0	1	0	0	1	0	0	13
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1	28	1	0	46	0	4	3	1	3	1	1	89
	APPROACH %	3%	93%	3%	0%	100%	0%	50%	38%	13%	60%	20%	20%	
	APP/DEPART	30	/	33	46	/	50	8	/	4	5	/	2	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	1	15	0	0	26	0	1	1	0	2	0	0	46
	APPROACH %	6%	94%	0%	0%	100%	0%	50%	50%	0%	100%	0%	0%	
	PEAK HR FACTOR		0.800			0.813			0.500			0.500		0.885
	APP/DEPART	16	/	16	26	/	28	2	/	1	2	/	1	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	5	0	0	3	0	0	0	0	0	0	0	8
	4:15 PM	0	4	0	0	3	0	2	2	0	0	0	0	11
	4:30 PM	0	5	0	1	0	0	0	0	0	0	1	0	7
	4:45 PM	0	2	0	1	4	0	0	0	0	0	0	0	7
	5:00 PM	0	5	1	1	1	0	0	0	0	1	0	0	9
	5:15 PM	0	6	0	0	4	0	0	1	0	0	0	0	11
	5:30 PM	0	5	2	1	2	0	1	0	0	0	0	0	11
	5:45 PM	0	5	0	0	1	0	1	0	0	0	0	0	7
	VOLUMES	0	37	3	4	18	0	4	3	0	1	1	0	71
	APPROACH %	0%	93%	8%	18%	82%	0%	57%	43%	0%	50%	50%	0%	
	APP/DEPART	40	/	41	22	/	19	7	/	10	2	/	1	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	0	21	3	2	8	0	2	1	0	1	0	0	38
	APPROACH %	0%	88%	13%	20%	80%	0%	67%	33%	0%	100%	0%	0%	
	PEAK HR FACTOR		0.857			0.500			0.750			0.250		0.864
	APP/DEPART	24	/	23	10	/	9	3	/	6	1	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	1	0

0	0	0	0

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
1	0	0	0

1	0	0	0

Euclid

NORTH SIDE

Schaefer WEST SIDE EAST SIDE **Schaefer**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	6
TUESDAY	EAST & WEST:	Schaefer	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Schaefer)			WESTBOUND (Schaefer)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	0	17	1	0	13	0	0	1	0	2	0	0	34
	7:15 AM	0	16	0	1	17	1	0	0	1	0	0	0	36
	7:30 AM	0	16	0	1	20	0	2	0	1	2	0	2	44
	7:45 AM	0	12	0	0	18	0	0	0	0	1	0	0	31
	8:00 AM	0	19	1	0	25	0	1	0	0	1	0	2	49
	8:15 AM	0	19	1	1	17	0	0	0	0	2	0	0	40
	8:30 AM	0	17	0	0	18	0	1	0	0	0	0	0	36
	8:45 AM	0	25	0	0	25	0	1	0	1	2	0	0	54
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	141	3	3	153	1	5	1	3	10	0	4	324
	APPROACH %	0%	98%	2%	2%	97%	1%	56%	11%	33%	71%	0%	29%	
	APP/DEPART	144	/	150	157	/	166	9	/	7	14	/	1	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	80	2	1	85	0	3	0	1	5	0	2	179
	APPROACH %	0%	98%	2%	1%	99%	0%	75%	0%	25%	71%	0%	29%	
	PEAK HR FACTOR		0.820			0.860			0.500			0.583		0.829
	APP/DEPART	82	/	85	86	/	91	4	/	3	7	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	13	0	2	7	1	0	0	0	2	0	0	25
	4:15 PM	0	9	0	0	11	0	0	3	0	0	0	0	23
	4:30 PM	0	19	0	1	12	0	1	0	0	1	0	1	35
	4:45 PM	0	10	2	0	17	0	0	0	0	1	0	0	30
	5:00 PM	0	19	0	2	7	0	1	0	0	0	0	1	30
	5:15 PM	0	18	0	0	14	0	1	0	0	0	0	0	33
	5:30 PM	0	11	0	0	10	0	0	0	1	0	0	0	22
	5:45 PM	0	8	0	0	11	0	0	0	0	0	0	0	19
	VOLUMES	0	107	2	5	89	1	3	3	1	4	0	2	217
	APPROACH %	0%	98%	2%	5%	94%	1%	43%	43%	14%	67%	0%	33%	
	APP/DEPART	109	/	112	95	/	94	7	/	10	6	/	1	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	0	66	2	3	50	0	3	0	0	2	0	2	128
	APPROACH %	0%	97%	3%	6%	94%	0%	100%	0%	0%	50%	0%	50%	
	PEAK HR FACTOR		0.895			0.779			0.750			0.500		0.914
	APP/DEPART	68	/	71	53	/	52	3	/	5	4	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	1	0	0
0	0	1	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	1	1	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Euclid

NORTH SIDE

Schaefer WEST SIDE EAST SIDE **Schaefer**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Euclid	LOCATION #:	7
	EAST & WEST:	Edison	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Edison)			WESTBOUND (Edison)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	31	148	7	8	160	35	28	20	17	11	97	6	568
	7:15 AM	43	180	6	11	139	34	23	30	22	11	82	9	590
	7:30 AM	37	189	5	5	172	34	30	43	21	10	91	6	643
	7:45 AM	44	202	8	12	167	31	27	42	34	18	102	7	694
	8:00 AM	35	210	11	8	181	36	25	25	34	14	57	8	644
	8:15 AM	51	175	7	5	183	36	32	30	30	10	58	8	625
	8:30 AM	36	177	4	6	164	29	34	38	29	9	53	9	588
	8:45 AM	44	155	3	7	146	35	32	31	30	6	65	5	559
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	321	1,436	51	62	1,312	270	231	259	217	89	605	58	4,911
	APPROACH %	18%	79%	3%	4%	80%	16%	33%	37%	31%	12%	80%	8%	
	APP/DEPART	1,808	/	1,727	1,644	/	1,626	707	/	370	752	/	1,188	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	167	776	31	30	703	137	114	140	119	52	308	29	2,606
	APPROACH %	17%	80%	3%	3%	81%	16%	31%	38%	32%	13%	79%	7%	
	PEAK HR FACTOR		0.951			0.967			0.905			0.766		0.939
	APP/DEPART	974	/	920	870	/	878	373	/	200	389	/	608	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	28	179	18	16	145	22	51	111	39	5	32	5	651
	4:15 PM	21	231	17	16	172	26	55	90	47	0	27	6	708
	4:30 PM	29	214	16	23	142	26	54	105	39	8	26	11	693
	4:45 PM	36	215	15	19	180	37	52	101	34	5	34	8	736
	5:00 PM	16	172	12	17	171	28	79	100	48	4	27	6	680
	5:15 PM	13	208	16	13	183	31	64	112	48	6	35	10	739
	5:30 PM	19	207	19	12	204	23	50	104	52	8	33	3	734
	5:45 PM	18	198	14	18	189	26	45	70	27	4	29	5	643
	VOLUMES	180	1,624	127	134	1,386	219	450	793	334	40	243	54	5,584
	APPROACH %	9%	84%	7%	8%	80%	13%	29%	50%	21%	12%	72%	16%	
	APP/DEPART	1,931	/	2,140	1,739	/	1,762	1,577	/	1,042	337	/	640	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	84	802	62	61	738	119	245	417	182	23	129	27	2,889
	APPROACH %	9%	85%	7%	7%	80%	13%	29%	49%	22%	13%	72%	15%	
	PEAK HR FACTOR		0.891			0.960			0.930			0.877		0.977
	APP/DEPART	948	/	1,082	918	/	944	844	/	532	179	/	331	0

U-TURNS

NB X	SB X	EB X	WB X	TTL
1	1	0	0	2
1	0	0	0	1
2	0	0	0	2
0	0	0	0	0
1	1	0	0	2
1	0	0	0	1
1	0	0	0	1
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
8	2	0	0	10
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	1	0	0	1
1	2	0	0	3
0	1	0	0	1
0	2	0	0	2
0	3	0	0	3
2	12	0	0	14

RTOR

NRR 0	SRR 0	ERR 0	WRR 0
5	10	11	0
3	10	12	0
3	11	11	0
2	8	22	2
5	3	17	0
4	7	13	0
4	8	15	3
0	5	22	2
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
26	62	123	7
14	29	63	2
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
5	8	20	0
5	7	23	0
1	13	15	2
2	10	19	0
5	4	21	2
5	11	23	3
8	1	27	0
5	6	12	2
36	60	160	9
20	26	90	5

Euclid

NORTH SIDE

Edison WEST SIDE EAST SIDE **Edison**

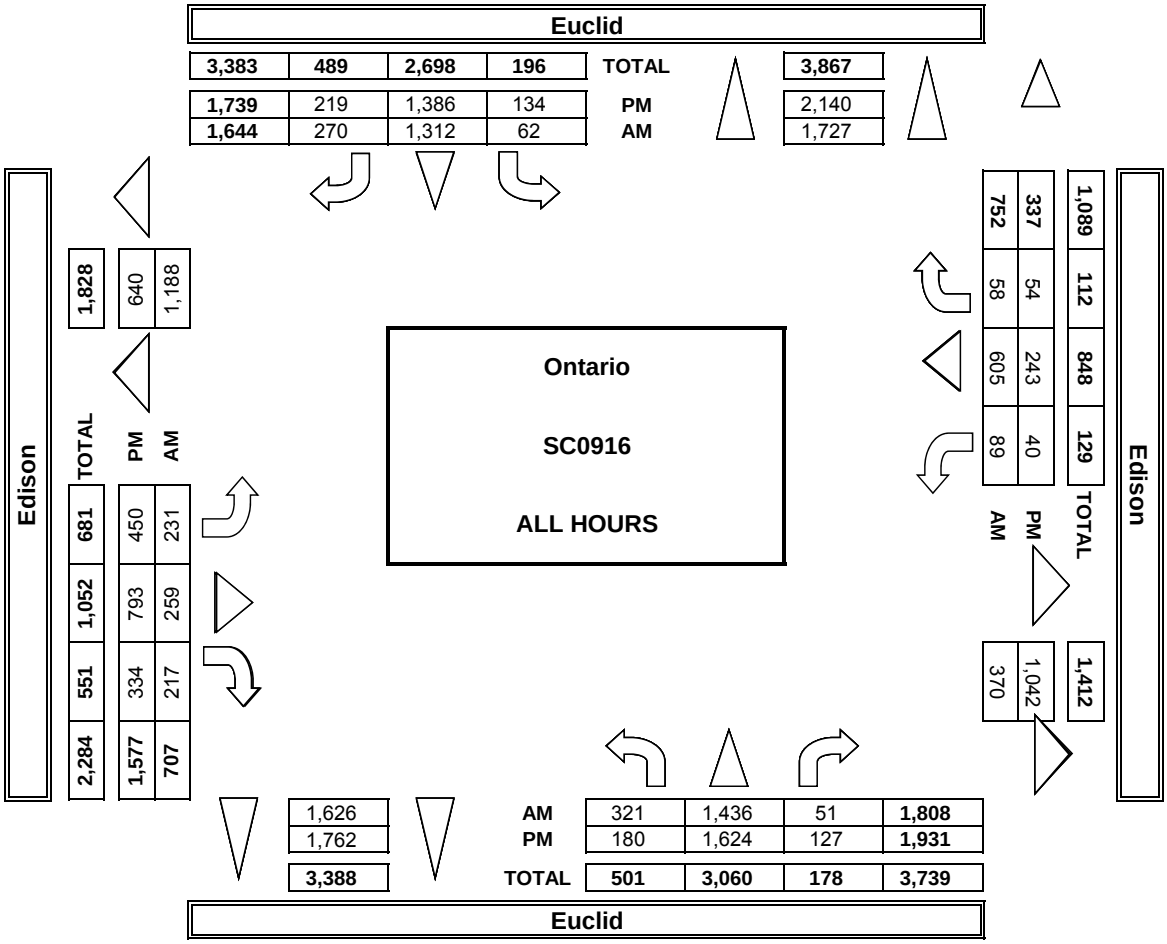
SOUTH SIDE

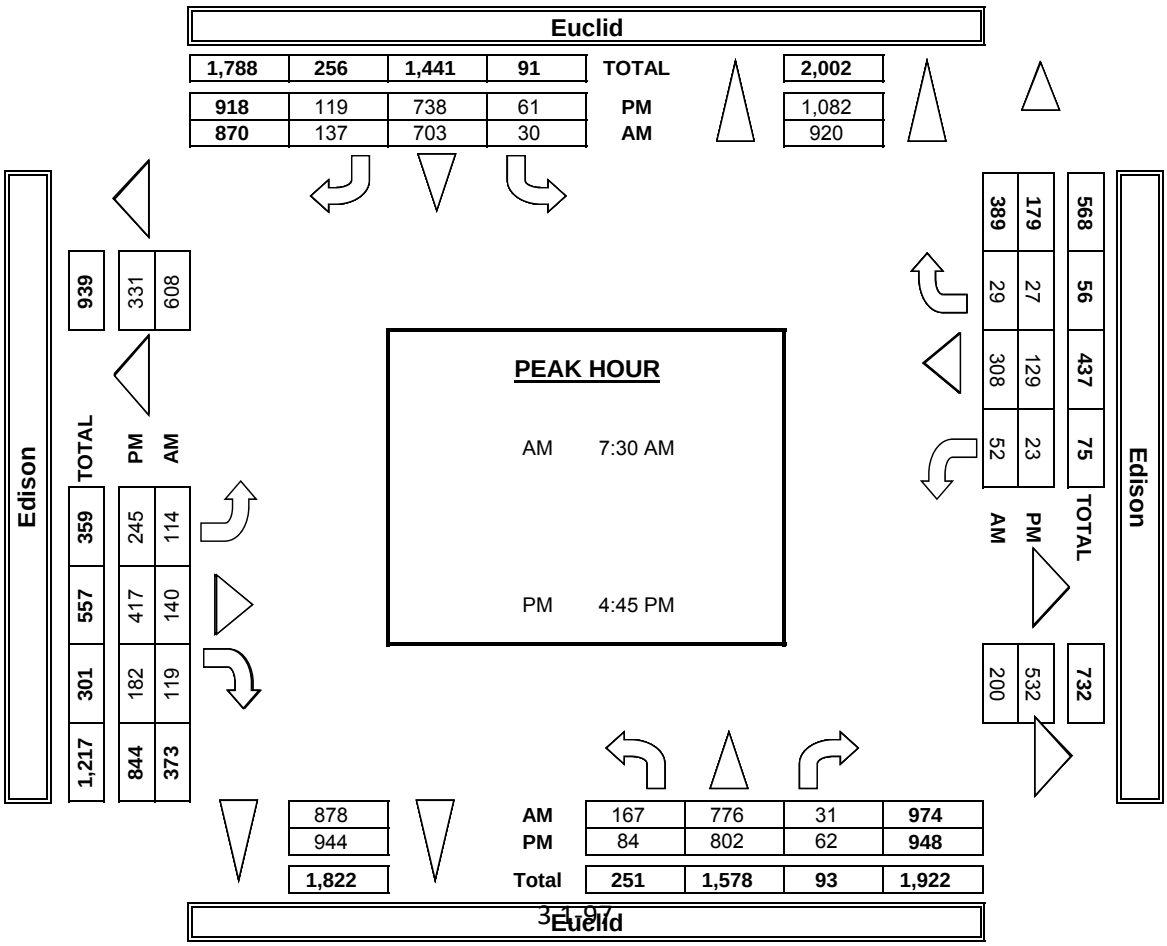
Euclid

	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	1	2	0	1	0	1	2	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	1	0	1	2	0	1	0	1	2	0	0	0	0	0
PM 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	2	2	0	0	0	1	1	0	0	0	1	1
4:15 PM	0	0	2	1	3	0	0	0	0	0	0	0	2	1	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	3	0	3	0	0	2	0	2	0	0	1	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	5	3	8	0	0	2	1	3	0	0	3	2	5

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	7
TUESDAY	EAST & WEST:	Edison	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS	NOTES:	AM / PM / MD / OTHER / OTHER	▲ N / ◄ W / E ► / S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Edison)			WESTBOUND (Edison)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
7:00 AM	0	8	0	1	14	2	2	0	0	0	1	1	29
7:15 AM	1	8	0	1	18	2	0	1	2	0	2	0	35
7:30 AM	1	14	0	0	11	1	0	0	2	0	0	0	29
7:45 AM	1	11	0	0	19	3	3	2	1	0	3	0	43
8:00 AM	3	6	0	0	14	2	1	1	0	0	0	0	27
8:15 AM	1	8	0	0	17	0	1	1	0	1	1	0	30
8:30 AM	2	7	0	0	15	2	1	1	0	0	0	0	28
8:45 AM	1	8	0	0	22	1	1	1	0	0	2	0	36
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	10	70	0	2	130	13	9	7	5	1	9	1	257
APPROACH %	13%	88%	0%	1%	90%	9%	43%	33%	24%	9%	82%	9%	
APP/DEPART	80	/	80	145	/	139	21	/	9	11	/	29	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	2	41	0	2	62	8	5	3	5	0	6	1	136
APPROACH %	5%	93%	0%	3%	86%	11%	38%	23%	38%	0%	86%	14%	
PEAK HR FACTOR		0.733			0.818			0.542			0.583		0.791
APP/DEPART	44	/	47	72	/	68	13	/	5	7	/	16	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	16	0	1	8	1	0	6	1	0	0	0	34
4:15 PM	0	18	3	0	8	2	0	4	2	0	0	0	37
4:30 PM	2	13	1	0	10	0	3	3	1	0	1	0	34
4:45 PM	0	12	1	0	6	0	0	0	1	0	0	0	20
5:00 PM	0	11	0	0	10	1	0	0	2	0	0	0	24
5:15 PM	0	10	0	0	6	0	3	2	0	0	1	1	23
5:30 PM	0	12	0	0	10	0	2	1	1	0	0	0	26
5:45 PM	0	9	0	0	9	0	2	0	1	0	0	1	22
VOLUMES	3	101	5	1	67	4	10	16	9	0	2	2	220
APPROACH %	3%	93%	5%	1%	93%	6%	29%	46%	26%	0%	50%	50%	
APP/DEPART	109	/	113	72	/	76	35	/	22	4	/	9	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	3	59	5	1	32	3	3	13	5	0	1	0	125
APPROACH %	4%	88%	7%	3%	89%	8%	14%	62%	24%	0%	100%	0%	
PEAK HR FACTOR		0.798			0.900			0.750			0.250		0.845
APP/DEPART	67	/	62	36	/	37	21	/	19	1	/	7	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
3	0	0	0	3
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	1	0
0	0	1	0
0	2	1	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	3	3	0
0	2	3	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	1	1
0	0	2	1
0	0	1	0

Euclid

NORTH SIDE

Edison WEST SIDE EAST SIDE **Edison**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	7
TUESDAY	EAST & WEST:	Edison	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Edison)			WESTBOUND (Edison)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
7:00 AM	1	2	0	0	3	0	3	0	0	0	1	0	10
7:15 AM	0	1	0	0	6	2	3	0	0	0	1	0	13
7:30 AM	0	2	0	0	5	1	1	2	0	0	3	0	14
7:45 AM	0	3	0	1	4	1	1	1	2	0	0	0	13
8:00 AM	0	4	0	1	4	2	0	1	1	1	1	0	15
8:15 AM	0	3	0	0	5	1	0	0	0	0	1	0	10
8:30 AM	0	2	0	0	4	3	1	0	2	1	0	0	13
8:45 AM	0	4	0	1	4	2	2	0	0	0	3	0	16
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	21	0	3	35	12	11	4	5	2	10	0	104
APPROACH %	5%	95%	0%	6%	70%	24%	55%	20%	25%	17%	83%	0%	
APP/DEPART	22	/	32	50	/	42	20	/	7	12	/	23	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	0	10	0	2	19	6	5	4	3	1	5	0	55
APPROACH %	0%	100%	0%	7%	70%	22%	42%	33%	25%	17%	83%	0%	
PEAK HR FACTOR		0.625			0.844			0.750			0.500		0.917
APP/DEPART	10	/	15	27	/	23	12	/	6	6	/	11	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	4	1	0	1	1	1	3	1	0	0	0	12
4:15 PM	0	2	0	0	3	0	0	0	0	0	0	0	5
4:30 PM	0	2	1	0	1	0	1	3	0	0	0	0	8
4:45 PM	0	4	1	0	4	1	2	1	1	0	0	0	14
5:00 PM	1	7	0	0	1	0	2	1	0	0	2	0	14
5:15 PM	0	3	0	0	1	1	2	1	0	0	0	0	8
5:30 PM	0	3	0	0	3	0	1	1	0	0	0	0	8
5:45 PM	0	3	0	0	1	1	3	2	0	0	0	1	11
VOLUMES	1	28	3	0	15	4	12	12	2	0	2	1	80
APPROACH %	3%	88%	9%	0%	79%	21%	46%	46%	8%	0%	67%	33%	
APP/DEPART	32	/	41	19	/	17	26	/	15	3	/	7	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	1	17	1	0	9	2	7	4	1	0	2	0	44
APPROACH %	5%	89%	5%	0%	82%	18%	58%	33%	8%	0%	100%	0%	
PEAK HR FACTOR		0.594			0.550			0.750			0.250		0.786
APP/DEPART	19	/	24	11	/	10	12	/	5	2	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	2	0	0
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	2	2	0

0	2	1	0

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0

1	0	0	0

Euclid

NORTH SIDE

Edison WEST SIDE EAST SIDE **Edison**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	7
TUESDAY	EAST & WEST:	Edison	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Edison			WESTBOUND Edison			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
7:00 AM	0	9	1	0	10	3	5	1	2	1	0	0	32
7:15 AM	3	11	0	1	7	9	6	0	2	0	1	1	41
7:30 AM	3	8	0	0	17	8	6	2	2	0	2	0	48
7:45 AM	1	5	0	0	9	8	9	1	1	1	1	0	36
8:00 AM	2	18	1	2	13	13	11	1	4	0	0	0	65
8:15 AM	4	6	0	0	8	8	10	3	3	2	2	1	47
8:30 AM	1	13	0	0	11	7	11	0	1	0	1	2	47
8:45 AM	0	6	0	1	12	17	10	2	1	2	3	1	55
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	14	76	2	4	87	73	68	10	16	6	10	5	371
APPROACH %	15%	83%	2%	2%	53%	45%	72%	11%	17%	29%	48%	24%	
APP/DEPART	92	/	149	164	/	109	94	/	16	21	/	97	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	7	43	1	3	44	45	42	6	9	4	6	4	214
APPROACH %	14%	84%	2%	3%	48%	49%	74%	11%	16%	29%	43%	29%	
PEAK HR FACTOR		0.607			0.767			0.891			0.583		0.823
APP/DEPART	51	/	89	92	/	57	57	/	10	14	/	58	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	2	4	2	0	7	5	8	5	0	1	0	1	35
4:15 PM	1	8	0	1	6	5	3	2	0	0	0	0	26
4:30 PM	1	7	2	2	6	5	12	0	1	0	0	0	36
4:45 PM	0	7	0	0	8	8	7	5	1	1	0	0	37
5:00 PM	0	5	0	0	5	2	8	3	3	0	0	1	27
5:15 PM	0	12	0	0	8	5	11	4	1	0	0	0	41
5:30 PM	1	3	0	0	7	3	8	2	1	0	0	0	25
5:45 PM	1	1	0	1	5	6	6	1	1	2	0	0	24
VOLUMES	6	47	4	4	52	39	63	22	8	4	0	2	251
APPROACH %	11%	82%	7%	4%	55%	41%	68%	24%	9%	67%	0%	33%	
APP/DEPART	57	/	112	95	/	64	93	/	30	6	/	45	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	1	31	2	2	27	20	38	12	6	1	0	1	141
APPROACH %	3%	91%	6%	4%	55%	41%	68%	21%	11%	50%	0%	50%	
PEAK HR FACTOR		0.708			0.766			0.875			0.500		0.860
APP/DEPART	34	/	70	49	/	34	56	/	16	2	/	21	0

U-TURNS					
NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

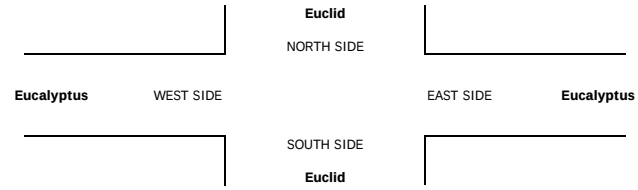
DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Euclid	LOCATION #:	8
	EAST & WEST:	Eucalyptus	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

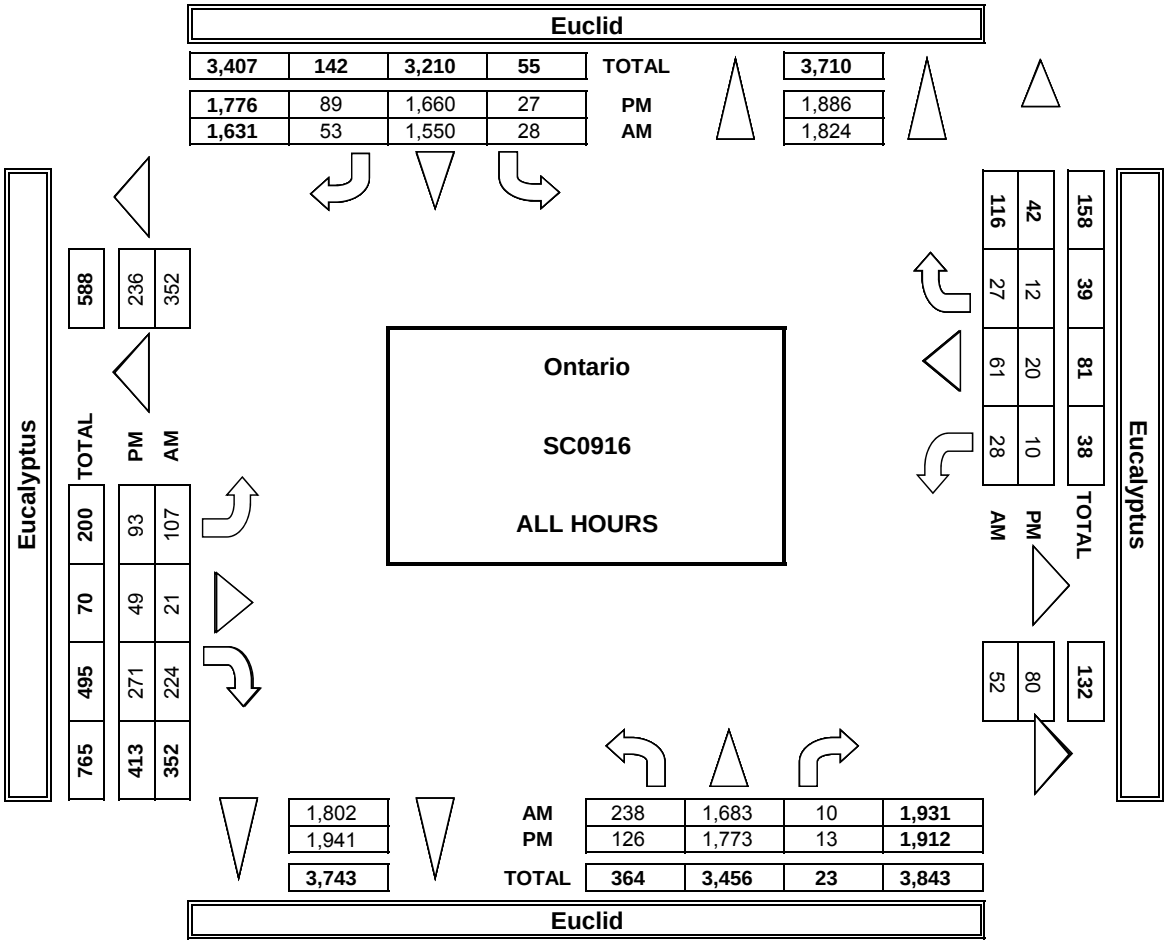
		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Eucalyptus)			WESTBOUND (Eucalyptus)				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	26	175	1	1	175	9	11	1	21	5	12	3	440	0	0	0	0	0	0	1	18	2
	7:15 AM	39	198	2	1	172	10	20	5	29	8	5	0	489	0	0	0	0	0	0	1	13	0
	7:30 AM	31	219	0	7	187	6	17	2	31	3	7	5	515	0	3	0	0	3	0	2	21	3
	7:45 AM	39	221	1	4	201	9	11	1	31	4	19	5	546	0	1	0	0	1	0	1	18	2
	8:00 AM	31	237	1	2	210	7	12	4	39	2	10	9	564	0	0	0	0	0	0	1	26	2
	8:15 AM	25	226	1	4	234	3	11	0	29	5	6	0	544	0	2	0	0	2	0	0	18	0
	8:30 AM	24	204	3	2	184	5	13	4	20	1	0	3	463	0	0	0	0	0	1	0	17	2
	8:45 AM	23	203	1	7	187	4	12	4	24	0	2	2	469	0	1	0	0	1	0	0	20	2
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	238	1,683	10	28	1,550	53	107	21	224	28	61	27	4,030	0	7	0	0	7	1	6	151	13
	APPROACH %	12%	87%	1%	2%	95%	3%	30%	6%	64%	24%	53%	23%										
	APP/DEPART	1,931	/	1,824	1,631	/	1,802	352	/	52	116	/	352	0									
	BEGIN PEAK HR		7:30 AM																				
	VOLUMES	126	903	3	17	832	25	51	7	130	14	42	19	2,169						0	4	83	7
	APPROACH %	12%	88%	0%	2%	95%	3%	27%	4%	69%	19%	56%	25%										
	PEAK HR FACTOR		0.959			0.907			0.855			0.670		0.961									
	APP/DEPART	1,032	/	979	874	/	976	188	/	21	75	/	193	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	16	214	4	4	173	6	12	6	28	0	1	2	466	0	1	0	0	1	1	0	21	1
	4:15 PM	12	185	1	3	211	11	17	7	31	1	4	2	485	0	0	0	0	0	0	0	22	1
	4:30 PM	11	275	0	6	173	15	14	7	33	1	1	0	536	0	2	0	0	2	0	1	18	0
	4:45 PM	18	246	3	4	178	9	4	2	35	3	2	1	505	0	2	0	0	2	0	1	32	1
	5:00 PM	15	193	0	1	227	9	10	14	42	0	2	0	513	0	1	0	0	1	0	0	28	0
	5:15 PM	14	216	3	2	237	15	11	8	29	2	1	2	540	0	0	1	0	1	1	0	17	1
	5:30 PM	22	225	1	3	257	11	16	4	35	2	5	4	585	0	1	0	0	1	0	0	27	0
	5:45 PM	18	219	1	4	204	13	9	1	38	1	4	1	513	0	2	0	0	2	0	0	25	1
	VOLUMES	126	1,773	13	27	1,660	89	93	49	271	10	20	12	4,143	0	9	1	0	10	2	2	190	5
	APPROACH %	7%	93%	1%	2%	93%	5%	23%	12%	66%	24%	48%	29%										
	APP/DEPART	1,912	/	1,886	1,776	/	1,941	413	/	80	42	/	236	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	69	853	5	10	925	48	46	27	144	5	12	7	2,151						1	0	97	2
	APPROACH %	7%	92%	1%	1%	94%	5%	21%	12%	66%	21%	50%	29%										
	PEAK HR FACTOR		0.934			0.907			0.822			0.545		0.919									
	APP/DEPART	927	/	909	983	/	1,074	217	/	38	24	/	130	0									

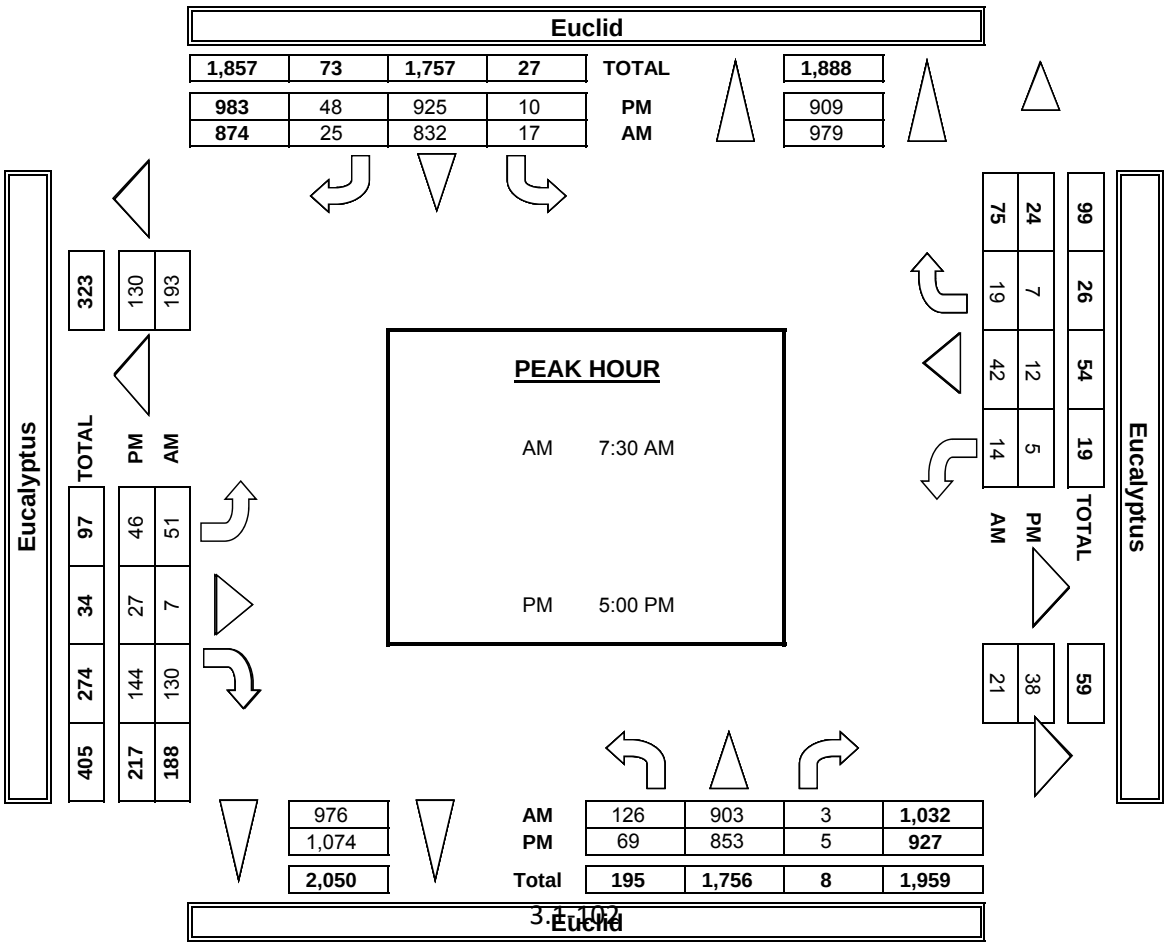


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:00 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	8:15 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	1	3	0	0	4	0	1	0	0	1	1	2	0	0	3
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	2	0	2
	4:30 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2
	4:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	5:00 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2
	5:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	TOTAL	0	7	2	0	9	0	0	0	0	0	0	7	2	0	9

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	8
TUESDAY	EAST & WEST:	Eucalyptus	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Eucalyptus			WESTBOUND Eucalyptus			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	1	10	0	0	11	0	0	0	0	0	0	0	22
	7:15 AM	0	9	0	1	16	1	0	0	0	0	0	0	27
	7:30 AM	0	14	0	0	12	0	1	0	0	0	0	0	27
	7:45 AM	1	11	0	0	15	0	1	0	0	0	0	0	28
	8:00 AM	0	11	0	0	14	1	0	0	0	0	1	1	28
	8:15 AM	0	9	0	0	15	0	0	0	0	0	0	0	24
	8:30 AM	0	10	0	0	18	0	0	0	0	0	0	0	28
	8:45 AM	0	7	0	0	15	0	0	0	0	0	0	0	22
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	2	81	0	1	116	2	2	0	0	0	1	1	206
	APPROACH %	2%	98%	0%	1%	97%	2%	100%	0%	0%	0%	50%	50%	
	APP/DEPART	83	/	84	119	/	116	2	/	1	2	/	5	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	1	45	0	1	57	2	2	0	0	0	1	1	110
	APPROACH %	2%	98%	0%	2%	95%	3%	100%	0%	0%	0%	50%	50%	
	PEAK HR FACTOR		0.821			0.833			0.500			0.250		0.982
	APP/DEPART	46	/	48	60	/	57	2	/	1	2	/	4	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	13	2	0	11	0	0	0	2	0	0	0	29
	4:15 PM	0	12	0	0	10	1	1	0	1	0	0	1	26
	4:30 PM	1	13	0	0	9	0	1	0	1	0	0	0	25
	4:45 PM	2	15	0	0	10	0	0	0	4	0	0	0	31
	5:00 PM	0	11	0	0	8	0	0	0	0	0	0	0	19
	5:15 PM	0	11	0	0	7	0	0	0	0	0	0	0	18
	5:30 PM	0	10	0	0	8	0	1	0	1	0	0	0	20
	5:45 PM	0	9	0	0	8	0	0	0	0	0	0	0	17
	VOLUMES	4	94	2	0	71	1	3	0	9	0	0	1	185
	APPROACH %	4%	94%	2%	0%	99%	1%	25%	0%	75%	0%	0%	100%	
	APP/DEPART	100	/	98	72	/	80	12	/	2	1	/	5	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	4	53	2	0	40	1	2	0	8	0	0	1	111
	APPROACH %	7%	90%	3%	0%	98%	2%	20%	0%	80%	0%	0%	100%	
	PEAK HR FACTOR		0.868			0.932			0.625			0.250		0.895
	APP/DEPART	59	/	56	41	/	48	10	/	2	1	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	8
TUESDAY	EAST & WEST:	Eucalyptus	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

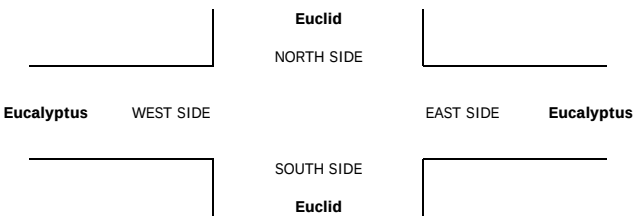
		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Eucalyptus)			WESTBOUND (Eucalyptus)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	0	2	0	0	3	0	0	0	0	0	0	0	5
	7:15 AM	0	1	0	0	6	0	0	0	0	0	0	0	7
	7:30 AM	0	5	0	1	4	0	0	0	0	0	0	2	12
	7:45 AM	1	1	0	0	3	0	0	0	0	0	0	0	5
	8:00 AM	1	1	0	0	4	0	0	0	0	0	0	0	6
	8:15 AM	0	3	0	1	3	0	0	0	0	0	0	0	7
	8:30 AM	0	3	0	0	3	0	0	0	0	0	0	1	7
	8:45 AM	0	3	0	1	5	0	0	0	0	0	0	0	9
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	2	19	0	3	31	0	0	0	0	0	0	3	58
	APPROACH %	10%	90%	0%	9%	91%	0%	0%	0%	0%	0%	0%	100%	
	APP/DEPART	21	/	23	34	/	31	0	/	2	3	/	2	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	2	10	0	1	14	0	0	0	0	0	0	2	30
	APPROACH %	17%	83%	0%	6%	88%	0%	0%	0%	0%	0%	0%	100%	
	PEAK HR FACTOR		0.600			0.667			0.000			0.250		0.625
	APP/DEPART	12	/	13	16	/	14	0	/	1	2	/	2	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	3	0	0	2	0	0	0	0	0	0	0	5
	4:15 PM	0	2	0	0	1	0	0	1	0	0	0	0	4
	4:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
	4:45 PM	0	3	0	0	2	0	0	0	0	0	0	0	5
	5:00 PM	0	4	0	0	4	0	0	0	0	0	0	0	8
	5:15 PM	0	4	0	0	2	0	0	0	0	0	0	0	6
	5:30 PM	0	2	0	1	1	0	0	0	0	0	0	0	4
	5:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
	VOLUMES	0	23	0	1	12	0	0	1	0	0	0	0	37
	APPROACH %	0%	100%	0%	8%	92%	0%	0%	100%	0%	0%	0%	0%	
	APP/DEPART	23	/	24	13	/	12	1	/	1	0	/	0	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	0	13	0	0	9	0	0	0	0	0	0	0	23
	APPROACH %	0%	100%	0%	0%	90%	0%	0%	0%	0%	0%	0%	0%	
	PEAK HR FACTOR		0.813			0.625			0.000			0.000		0.719
	APP/DEPART	13	/	14	10	/	9	0	/	0	0	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	2
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	8
TUESDAY	EAST & WEST:	Eucalyptus	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Eucalyptus)			WESTBOUND (Eucalyptus)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
7:00 AM	0	13	0	0	9	0	0	0	0	0	0	0	22
7:15 AM	0	12	0	0	9	0	1	0	0	0	0	0	22
7:30 AM	0	9	0	1	17	0	0	0	2	0	0	1	30
7:45 AM	0	5	0	0	9	0	0	0	0	0	0	0	14
8:00 AM	0	19	0	0	16	0	0	0	0	0	0	2	37
8:15 AM	0	9	0	0	13	0	0	0	0	1	0	0	23
8:30 AM	0	12	1	1	12	0	0	0	0	0	0	1	27
8:45 AM	0	9	0	0	17	0	0	0	0	0	0	1	27
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	88	1	2	102	0	1	0	2	1	0	5	202
APPROACH %	0%	99%	1%	2%	98%	0%	33%	0%	67%	17%	0%	83%	
APP/DEPART	89	/	95	104	/	105	3	/	2	6	/	0	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	49	1	1	58	0	0	0	0	1	0	4	114
APPROACH %	0%	98%	2%	2%	98%	0%	0%	0%	0%	20%	0%	80%	
PEAK HR FACTOR		0.658			0.868			0.000			0.625		0.770
APP/DEPART	50	/	53	59	/	59	0	/	2	5	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	10	0	1	7	0	0	0	0	0	1	1	20
4:15 PM	0	6	0	0	6	0	0	0	0	0	0	0	12
4:30 PM	0	13	0	1	4	0	0	0	0	0	0	0	18
4:45 PM	0	4	0	0	8	0	0	0	0	0	0	0	12
5:00 PM	0	5	0	0	9	0	0	0	0	0	0	0	14
5:15 PM	1	10	1	0	8	0	0	0	0	0	0	1	21
5:30 PM	0	4	0	0	8	0	0	0	0	0	0	0	12
5:45 PM	0	4	0	0	9	0	0	0	0	0	0	0	13
VOLUMES	1	56	1	2	59	0	0	0	0	0	1	2	122
APPROACH %	2%	97%	2%	3%	97%	0%	0%	0%	0%	0%	33%	67%	
APP/DEPART	58	/	59	61	/	59	0	/	2	3	/	2	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	1	32	1	0	29	0	0	0	0	0	0	1	65
APPROACH %	3%	94%	3%	0%	97%	0%	0%	0%	0%	0%	0%	100%	
PEAK HR FACTOR		0.654			0.833			0.000			0.250		0.774
APP/DEPART	34	/	34	30	/	29	0	/	1	1	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1

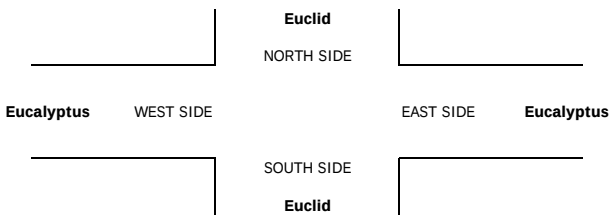
RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	2	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	2	1

1	0	0	1

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Euclid
EAST & WEST: Merrill

PROJECT #: SC0916
LOCATION #: 9
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Merrill)			WESTBOUND (Merrill)				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	5	162	11	17	161	21	0	0	3	28	16	38	462	0	0	0	0	0	3	1	1	6
	7:15 AM	9	176	9	33	174	23	1	1	2	34	8	52	522	0	0	0	0	0	4	6	1	14
	7:30 AM	6	226	35	34	166	11	2	0	1	35	13	45	574	0	0	0	0	0	7	1	1	11
	7:45 AM	5	202	22	36	207	12	0	3	1	39	19	58	604	0	0	0	0	0	8	2	0	16
	8:00 AM	1	229	17	44	199	6	1	0	1	28	6	39	571	0	0	0	0	0	4	0	0	13
	8:15 AM	1	194	26	32	236	7	2	1	0	45	4	32	580	0	0	0	0	0	6	0	0	4
	8:30 AM	6	190	28	27	186	0	0	1	0	25	5	31	499	0	0	0	0	0	5	0	0	7
	8:45 AM	2	182	15	28	156	5	2	1	1	24	1	32	449	0	0	0	0	0	0	0	0	3
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	35	1,561	163	251	1,485	85	8	7	9	258	72	327	4,261	0	0	0	0	0	37	10	3	74
	APPROACH %	2%	89%	9%	14%	82%	5%	33%	29%	38%	39%	11%	50%										
	APP/DEPART	1,759	/	1,896	1,821	/	1,752	24	/	421	657	/	192	0									
	BEGIN PEAK HR		7:30 AM																				
	VOLUMES	13	851	100	146	808	36	5	4	3	147	42	174	2,329						25	3	1	44
	APPROACH %	1%	88%	10%	15%	82%	4%	42%	33%	25%	40%	12%	48%										
	PEAK HR FACTOR		0.903			0.900			0.750			0.782		0.964									
	APP/DEPART	964	/	1,030	990	/	958	12	/	250	363	/	91	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	184	33	39	171	1	12	10	5	12	1	16	484	0	1	0	0	1	4	0	3	8
	4:15 PM	1	231	23	40	199	0	4	17	4	14	1	25	559	0	0	0	0	0	3	0	3	13
	4:30 PM	2	238	40	49	160	0	6	4	6	23	0	27	555	1	0	0	0	1	4	0	4	11
	4:45 PM	0	212	46	63	171	0	2	10	4	21	0	32	561	0	1	0	0	1	12	0	3	9
	5:00 PM	0	206	40	59	190	1	2	9	1	28	0	23	559	0	0	0	0	0	8	0	1	4
	5:15 PM	1	197	35	55	221	0	0	0	0	20	0	13	542	1	0	0	0	1	1	0	0	4
	5:30 PM	0	244	33	54	238	0	0	1	3	20	0	22	615	0	0	0	0	0	6	0	3	9
	5:45 PM	0	212	30	43	202	0	0	0	1	23	1	17	529	0	0	0	0	0	1	0	1	5
	VOLUMES	4	1,724	280	402	1,552	2	26	51	24	161	3	175	4,404	2	2	0	0	4	39	0	18	63
	APPROACH %	0%	86%	14%	21%	79%	0%	26%	50%	24%	47%	1%	52%										
	APP/DEPART	2,008	/	1,927	1,956	/	1,739	101	/	731	339	/	7	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	1	859	154	231	820	1	4	20	8	89	0	90	2,277						27	0	7	26
	APPROACH %	0%	85%	15%	22%	78%	0%	13%	63%	25%	50%	0%	50%										
	PEAK HR FACTOR		0.915			0.901			0.500			0.844		0.926									
	APP/DEPART	1,014	/	954	1,052	/	918	32	/	404	179	/	1	0									

Euclid

NORTH SIDE

Merrill WEST SIDE EAST SIDE **Merrill**

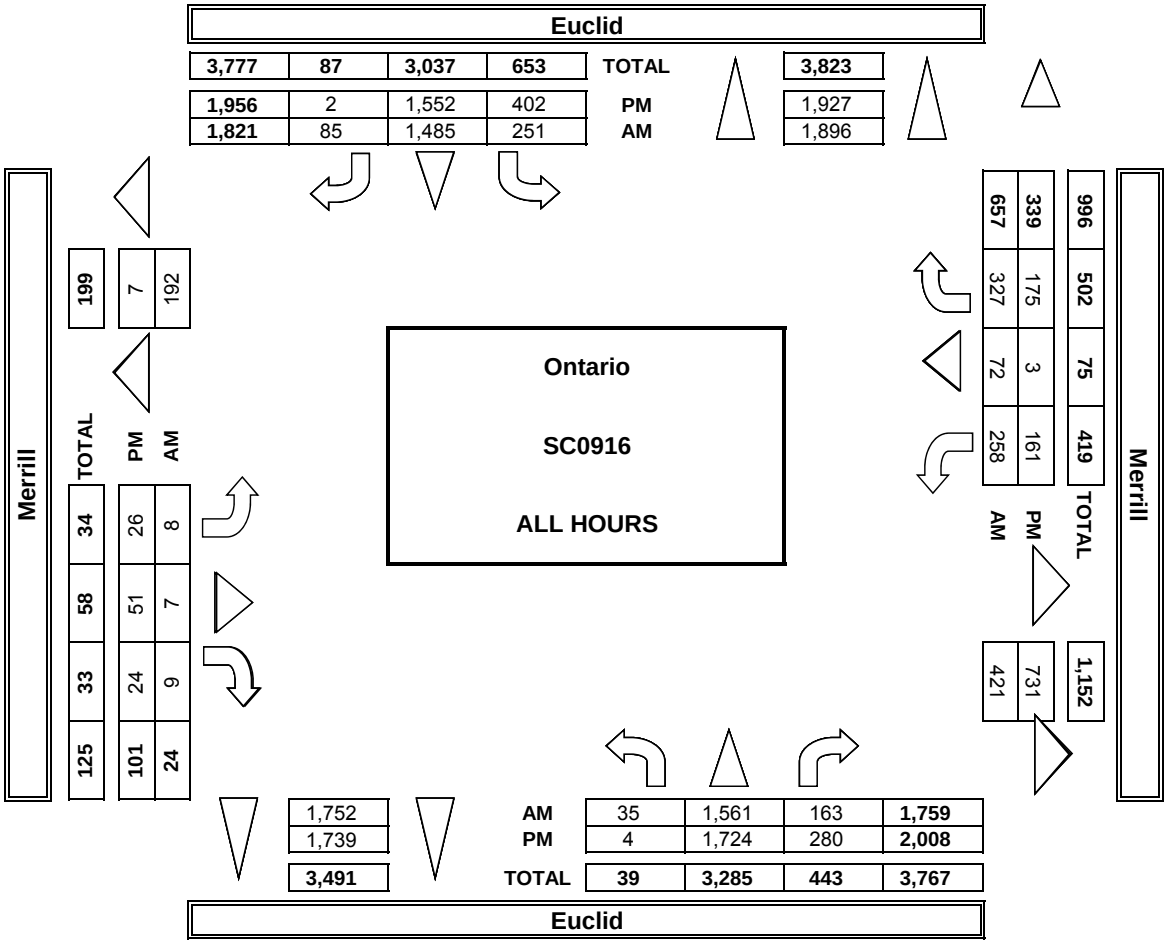
SOUTH SIDE

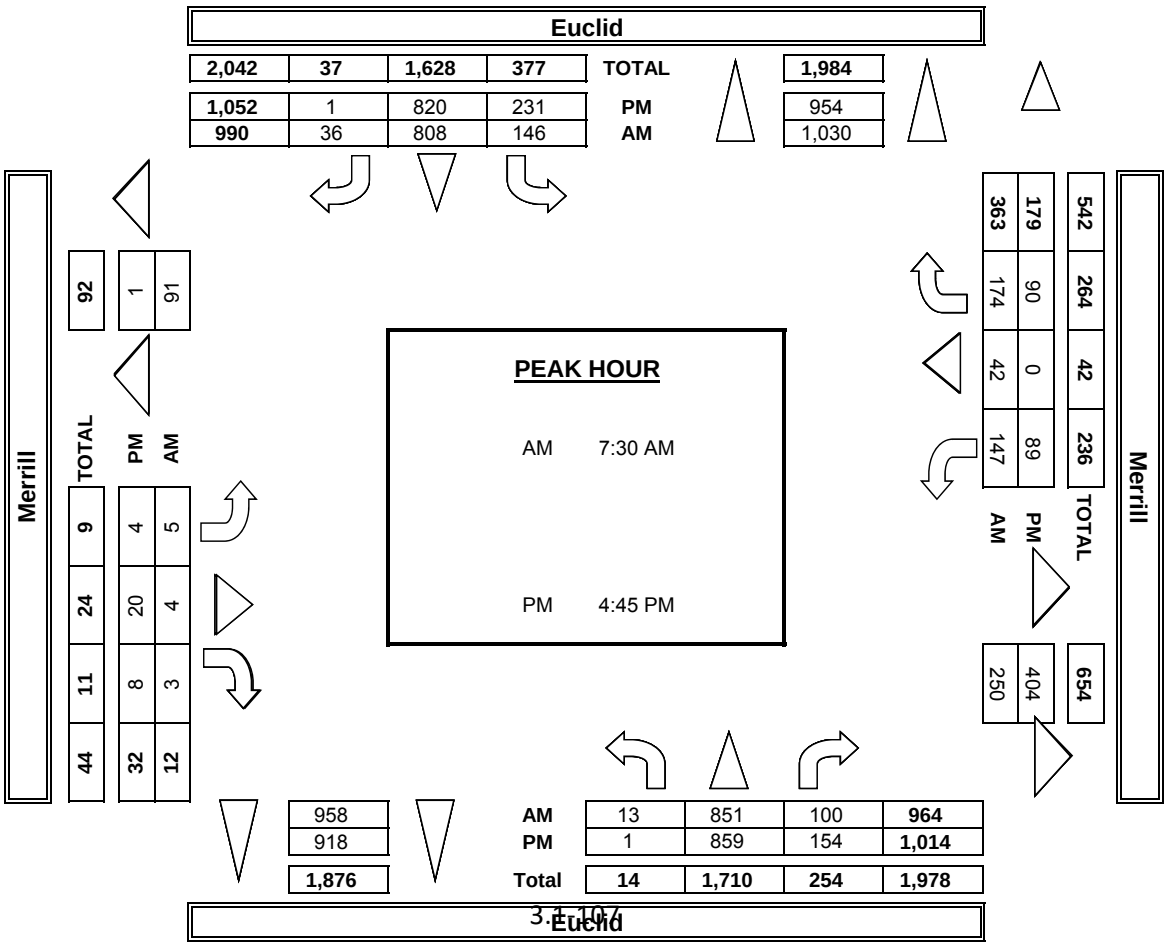
Euclid

	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	2	2	0	0	0	1	1	0	0	0	1	1
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	1	1	0	0	2	0	0	0	0	0	1	1	0	0	2
	4:30 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2
	4:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	5:30 PM	1	1	0	0	2	0	0	0	0	0	1	1	0	0	2
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	3	5	0	0	8	0	0	0	0	0	3	5	0	0	8

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	9
TUESDAY	EAST & WEST:	Merrill	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Merrill)			WESTBOUND (Merrill)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
7:00 AM	0	6	1	0	8	0	0	0	0	1	0	2	18
7:15 AM	0	3	0	1	14	0	0	0	0	3	0	1	22
7:30 AM	0	14	2	2	8	0	1	0	0	0	1	1	29
7:45 AM	1	12	2	0	12	1	0	3	1	3	0	2	37
8:00 AM	0	7	0	3	13	0	0	0	1	3	0	2	29
8:15 AM	0	7	2	0	20	2	0	1	0	0	0	1	33
8:30 AM	0	8	0	2	13	0	0	1	0	0	1	0	25
8:45 AM	1	9	1	1	20	1	0	0	0	0	0	0	33
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	2	66	8	9	108	4	1	5	2	10	2	9	226
APPROACH %	3%	87%	11%	7%	89%	3%	13%	63%	25%	48%	10%	43%	
APP/DEPART	76	/	76	121	/	120	8	/	22	21	/	8	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	1	40	6	5	53	3	1	4	2	6	1	6	128
APPROACH %	2%	85%	13%	8%	87%	5%	14%	57%	29%	46%	8%	46%	
PEAK HR FACTOR		0.734			0.693			0.438			0.650		0.865
APP/DEPART	47	/	47	61	/	61	7	/	15	13	/	5	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	13	1	2	13	0	0	0	0	1	0	1	31
4:15 PM	1	18	2	0	8	0	0	0	0	0	0	0	29
4:30 PM	0	13	3	1	5	0	1	0	1	0	0	0	24
4:45 PM	0	6	6	2	7	0	0	0	2	2	0	1	26
5:00 PM	0	8	1	2	9	0	0	0	0	1	0	2	23
5:15 PM	0	7	2	0	7	0	0	0	0	0	0	1	17
5:30 PM	0	10	1	2	5	0	0	0	0	0	0	0	18
5:45 PM	0	11	2	1	6	0	0	0	0	0	0	0	20
VOLUMES	1	86	18	10	60	0	1	0	3	4	0	5	188
APPROACH %	1%	82%	17%	14%	86%	0%	25%	0%	75%	44%	0%	56%	
APP/DEPART	105	/	93	70	/	67	4	/	27	9	/	1	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	50	12	4	33	0	1	0	3	3	0	2	110
APPROACH %	2%	79%	19%	11%	87%	0%	25%	0%	75%	60%	0%	40%	
PEAK HR FACTOR		0.750			0.633			0.500			0.417		0.887
APP/DEPART	63	/	54	38	/	39	4	/	16	5	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	1
1	0	0	1
1	0	0	0
0	0	0	1
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
3	0	0	3
3	0	0	2
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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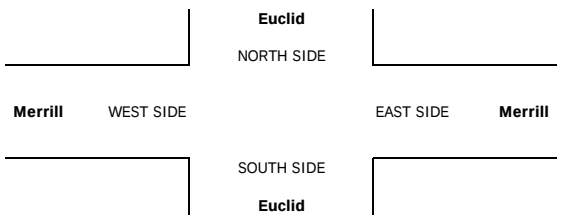
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	2	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	2	1
1	0	2	1



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	9
TUESDAY	EAST & WEST:	Merrill	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Merrill)			WESTBOUND (Merrill)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	1	4	0	1	10	1	0	0	0	2	0	1	20
	7:15 AM	0	3	0	1	3	1	0	0	0	4	0	2	14
	7:30 AM	0	5	0	0	4	0	0	0	0	0	1	0	10
	7:45 AM	0	1	0	0	2	0	0	0	0	0	0	1	4
	8:00 AM	0	1	0	0	1	0	0	0	0	1	0	0	3
	8:15 AM	0	1	0	1	2	0	0	0	0	0	0	0	4
	8:30 AM	0	1	0	0	3	0	0	0	0	0	0	0	4
	8:45 AM	0	1	0	0	2	0	0	0	0	0	0	0	3
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1	17	0	3	27	2	0	0	0	7	1	4	62
	APPROACH %	6%	94%	0%	9%	84%	6%	0%	0%	0%	58%	8%	33%	
	APP/DEPART	18	/	21	32	/	34	0	/	3	12	/	4	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	1	13	0	2	19	2	0	0	0	6	1	4	48
	APPROACH %	7%	93%	0%	9%	83%	9%	0%	0%	0%	55%	9%	36%	
	PEAK HR FACTOR		0.700			0.479			0.000			0.458		0.600
	APP/DEPART	14	/	17	23	/	25	0	/	2	11	/	4	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	4	1	0	2	0	0	0	0	1	0	0	8
	4:15 PM	0	4	0	1	1	0	0	0	0	0	0	0	6
	4:30 PM	0	4	1	0	1	0	0	0	1	0	0	1	8
	4:45 PM	0	3	0	0	3	0	0	0	0	0	0	1	7
	5:00 PM	0	3	1	0	1	0	0	0	0	0	0	0	5
	5:15 PM	0	2	0	0	1	0	0	0	0	0	0	0	3
	5:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	2
	5:45 PM	0	1	0	0	1	0	0	0	0	1	0	0	3
	VOLUMES	0	22	3	1	11	0	0	0	1	2	0	2	42
	APPROACH %	0%	88%	12%	8%	92%	0%	0%	0%	100%	50%	0%	50%	
	APP/DEPART	25	/	24	12	/	14	1	/	4	4	/	0	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	15	2	1	7	0	0	0	1	1	0	2	29
	APPROACH %	0%	88%	12%	13%	88%	0%	0%	0%	100%	33%	0%	67%	
	PEAK HR FACTOR		0.850			0.667			0.250			0.750		0.906
	APP/DEPART	17	/	17	8	/	9	1	/	3	3	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Euclid

NORTH SIDE

Merrill WEST SIDE EAST SIDE **Merrill**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	9
TUESDAY	EAST & WEST:	Merrill	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

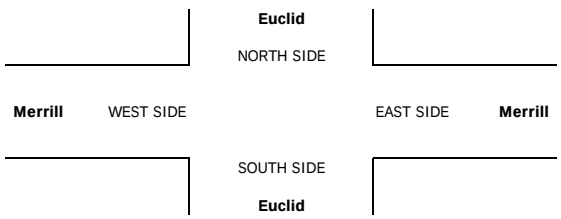
	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Merrill)			WESTBOUND (Merrill)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
7:00 AM	0	13	0	2	12	0	0	0	0	1	1	2	31
7:15 AM	0	9	0	1	10	1	1	0	0	2	0	2	26
7:30 AM	0	5	1	1	14	0	0	0	0	3	0	3	27
7:45 AM	0	5	0	1	11	0	0	0	0	3	0	1	21
8:00 AM	0	13	0	2	12	0	0	0	0	1	0	2	30
8:15 AM	0	6	1	2	12	0	1	0	0	0	1	2	25
8:30 AM	1	12	0	2	13	0	0	0	0	1	0	1	30
8:45 AM	1	6	0	1	13	1	0	0	0	1	0	0	23
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	2	69	2	12	97	2	2	0	0	12	2	13	213
APPROACH %	3%	95%	3%	11%	87%	2%	100%	0%	0%	44%	7%	48%	
APP/DEPART	73	/	84	111	/	109	2	/	14	27	/	6	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	2	37	1	7	50	1	1	0	0	3	1	5	108
APPROACH %	5%	93%	3%	12%	86%	2%	100%	0%	0%	33%	11%	56%	
PEAK HR FACTOR		0.769			0.967			0.250			0.750		0.900
APP/DEPART	40	/	43	58	/	53	1	/	8	9	/	4	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	6	3	2	5	0	0	0	0	0	0	3	19
4:15 PM	0	4	3	0	5	0	0	0	0	2	0	1	15
4:30 PM	0	8	1	1	3	0	0	0	0	2	0	1	16
4:45 PM	0	8	4	2	7	0	0	0	0	1	0	0	22
5:00 PM	0	5	2	5	4	0	0	0	0	0	0	1	17
5:15 PM	0	10	2	2	7	0	0	0	0	0	0	2	23
5:30 PM	0	2	3	5	3	0	0	0	0	0	0	0	13
5:45 PM	0	2	1	3	7	0	0	0	0	0	0	3	16
VOLUMES	0	45	19	20	41	0	0	0	0	5	0	11	141
APPROACH %	0%	70%	30%	33%	67%	0%	0%	0%	0%	31%	0%	69%	
APP/DEPART	64	/	56	61	/	46	0	/	39	16	/	0	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	0	31	9	10	21	0	0	0	0	3	0	4	78
APPROACH %	0%	78%	23%	32%	68%	0%	0%	0%	0%	43%	0%	57%	
PEAK HR FACTOR		0.833			0.861			0.000			0.583		0.848
APP/DEPART	40	/	35	31	/	24	0	/	19	7	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	2
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	3
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
2	0	0	3
2	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Euclid	LOCATION #:	10
	EAST & WEST:	Kimball	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 2	ER 0	WL 1	WT 1.5	WR 0.5	TOTAL
AM	7:00 AM	14	104	3	26	140	48	21	61	5	4	210	49	685
	7:15 AM	19	128	0	38	111	43	13	40	5	1	143	49	590
	7:30 AM	11	167	1	24	116	61	25	50	6	6	171	59	697
	7:45 AM	28	134	5	32	110	79	19	54	5	8	169	61	704
	8:00 AM	21	134	4	30	121	60	29	46	5	2	141	59	652
	8:15 AM	19	143	8	50	138	45	19	55	3	8	143	64	695
	8:30 AM	10	156	5	51	149	43	21	39	5	5	86	62	632
	8:45 AM	30	142	9	31	140	36	11	40	4	4	99	49	595
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	152	1,108	35	282	1,025	415	158	385	38	38	1,162	452	5,250
	APPROACH %	12%	86%	3%	16%	60%	24%	27%	66%	7%	2%	70%	27%	
	APP/DEPART	1,295	/	1,719	1,722	/	1,116	581	/	701	1,652	/	1,714	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	79	578	18	136	485	245	92	205	19	24	624	243	2,748
	APPROACH %	12%	86%	3%	16%	56%	28%	29%	65%	6%	3%	70%	27%	
	PEAK HR FACTOR		0.943			0.929			0.975			0.936		0.976
	APP/DEPART	675	/	913	866	/	535	316	/	359	891	/	941	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	12	118	5	58	95	19	47	105	12	4	34	26	535
	4:15 PM	11	157	7	73	129	14	37	129	7	4	54	40	662
	4:30 PM	14	197	2	53	108	18	66	152	7	6	59	31	713
	4:45 PM	17	173	4	46	116	18	57	155	11	5	58	45	705
	5:00 PM	28	128	3	71	168	15	73	167	5	4	48	32	742
	5:15 PM	8	155	9	58	149	15	69	195	7	7	50	28	750
	5:30 PM	12	148	4	63	148	11	88	214	17	7	58	28	798
	5:45 PM	14	161	5	73	163	16	43	181	11	3	64	30	764
	VOLUMES	116	1,237	39	495	1,076	126	480	1,298	77	40	425	260	5,669
	APPROACH %	8%	89%	3%	29%	63%	7%	26%	70%	4%	6%	59%	36%	
	APP/DEPART	1,392	/	1,981	1,697	/	1,208	1,855	/	1,829	725	/	651	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	62	592	21	265	628	57	273	757	40	21	220	118	3,054
	APPROACH %	9%	88%	3%	28%	66%	6%	26%	71%	4%	6%	61%	33%	
	PEAK HR FACTOR		0.938			0.935			0.839			0.925		0.957
	APP/DEPART	675	/	986	950	/	698	1,070	/	1,040	359	/	330	0

U-TURNS

NB X	SB X	EB X	WB X	TTL
1	0	0	0	1
4	0	0	0	4
1	0	0	0	1
3	0	0	0	3
2	0	0	0	2
1	0	0	0	1
2	0	0	0	2
1	1	0	0	2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
15	1	0	0	16
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
2	0	0	0	2
1	0	0	0	1
4	0	0	1	5
0	0	0	0	0
1	1	0	0	2
8	2	0	0	10
0	0	0	0	0
16	4	0	1	21

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
2	10	0	3
0	6	0	4
0	5	0	5
1	10	0	4
4	18	1	4
3	4	1	9
2	12	2	21
2	7	0	3
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
14	72	4	53
8	37	2	22
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	8	1	5
3	4	0	10
1	3	0	3
0	6	3	1
2	4	0	9
6	3	0	7
3	5	1	9
3	5	3	8
18	38	8	52
14	17	4	33

Euclid

NORTH SIDE

Kimball WEST SIDE EAST SIDE **Kimball**

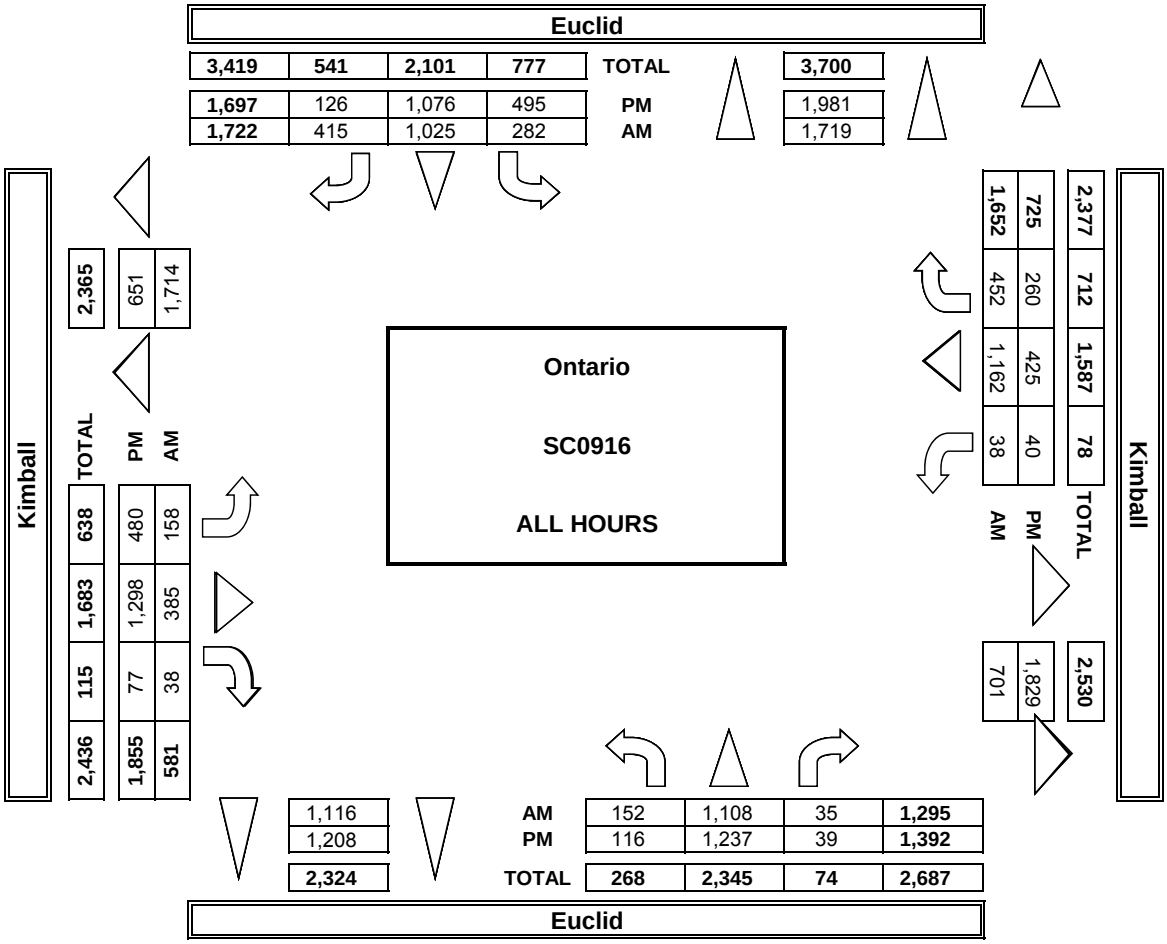
SOUTH SIDE

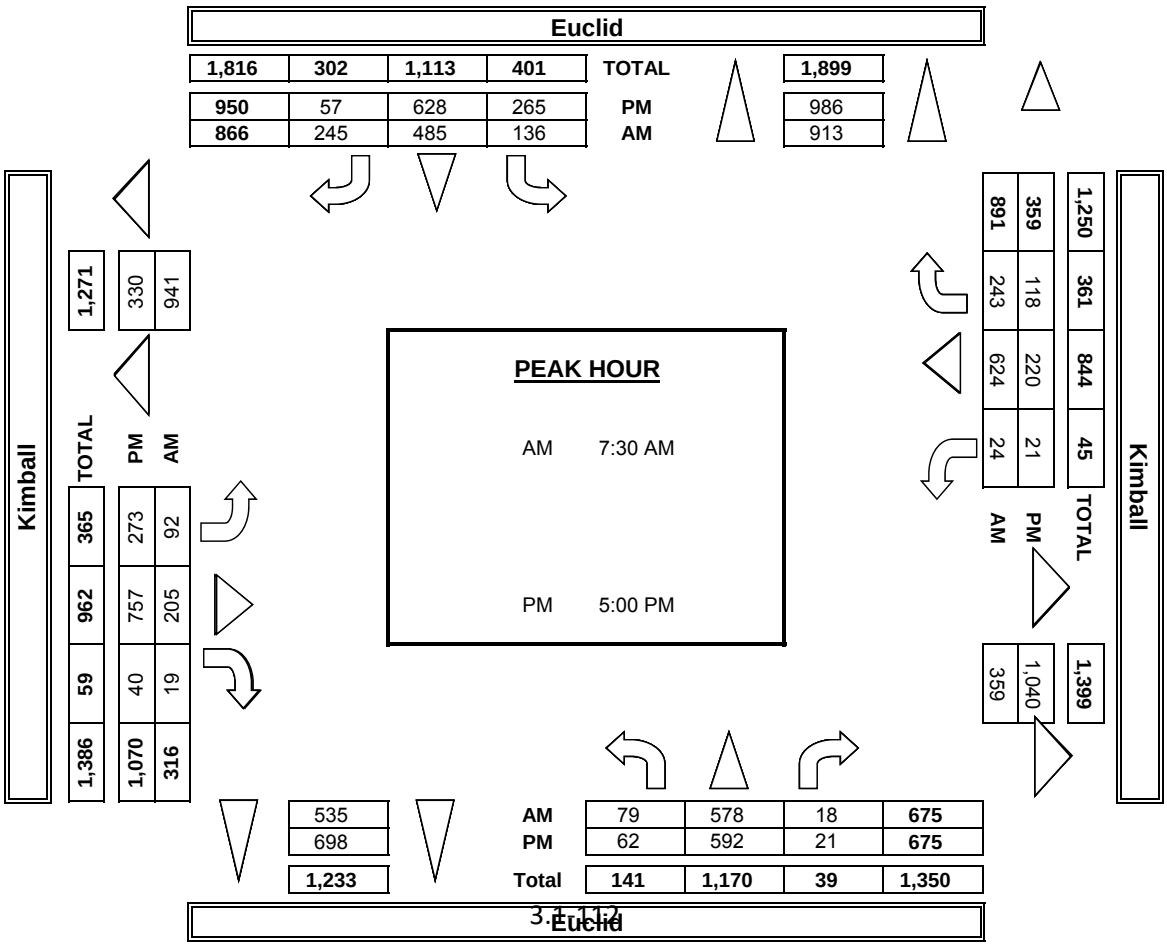
Euclid

	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	2	0	2	0	0	0	0	0	0	0	2	0	2
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	1	1	0	2	0	0	0	0	0	0	1	1	0	2
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	1	3	0	4	0	0	0	0	0	0	1	3	0	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	10
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Kimball			WESTBOUND Kimball			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 2	ER 0	WL 1	WT 1.5	WR 0.5	TOTAL
AM	7:00 AM	0	6	0	0	11	1	2	1	0	1	0	0	22
	7:15 AM	0	4	0	0	10	0	1	0	0	0	0	0	15
	7:30 AM	0	11	0	2	11	1	2	1	0	0	1	1	30
	7:45 AM	0	12	0	0	18	2	1	1	0	0	1	0	35
	8:00 AM	1	7	0	0	15	0	0	1	0	0	0	0	24
	8:15 AM	1	7	0	0	11	2	2	1	0	0	0	0	24
	8:30 AM	1	5	0	2	12	1	0	0	0	1	0	1	23
	8:45 AM	0	7	0	0	11	4	1	2	0	0	0	1	26
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	3	59	0	4	99	11	9	7	0	2	2	3	199
	APPROACH %	5%	95%	0%	4%	87%	10%	56%	44%	0%	29%	29%	43%	
	APP/DEPART	62	/	71	114	/	101	16	/	11	7	/	16	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	2	37	0	2	55	5	5	4	0	0	2	1	113
	APPROACH %	5%	95%	0%	3%	89%	8%	56%	44%	0%	0%	67%	33%	
	PEAK HR FACTOR		0.813			0.775			0.750			0.375		0.807
	APP/DEPART	39	/	43	62	/	55	9	/	6	3	/	9	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	13	0	2	8	2	1	2	0	0	0	0	29
	4:15 PM	0	11	0	0	7	2	1	0	1	0	1	0	23
	4:30 PM	1	15	0	0	6	0	0	0	0	0	0	0	22
	4:45 PM	0	13	0	0	7	2	1	0	0	0	0	0	23
	5:00 PM	1	9	0	0	8	1	3	0	0	0	0	0	22
	5:15 PM	0	8	0	0	7	0	1	1	1	0	0	0	18
	5:30 PM	0	13	0	2	7	0	0	2	0	0	0	0	24
	5:45 PM	0	9	0	0	6	0	3	0	0	0	1	1	20
	VOLUMES	3	91	0	4	56	7	10	5	2	0	2	1	181
	APPROACH %	3%	97%	0%	6%	84%	10%	59%	29%	12%	0%	67%	33%	
	APP/DEPART	94	/	102	67	/	58	17	/	9	3	/	12	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	2	52	0	2	28	6	3	2	1	0	1	0	97
	APPROACH %	4%	96%	0%	6%	78%	17%	50%	33%	17%	0%	100%	0%	
	PEAK HR FACTOR		0.844			0.750			0.500			0.250		0.836
	APP/DEPART	54	/	55	36	/	29	6	/	4	1	/	9	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	10
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 2	ER 0	WL 1	WT 1.5	WR 0.5	TOTAL
AM	7:00 AM	0	1	0	0	1	3	2	1	0	0	0	1	9
	7:15 AM	1	1	0	2	5	0	1	1	0	0	0	0	11
	7:30 AM	0	2	0	0	1	1	0	0	0	0	0	1	5
	7:45 AM	0	1	0	0	4	0	1	1	0	0	0	1	8
	8:00 AM	0	0	0	0	2	2	1	0	0	0	2	1	8
	8:15 AM	0	1	0	0	2	0	1	0	0	0	0	0	4
	8:30 AM	0	1	0	1	4	0	1	0	1	0	0	0	8
	8:45 AM	0	1	0	1	3	1	1	0	0	0	1	0	8
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1	8	0	4	22	7	8	3	1	0	3	4	61
	APPROACH %	11%	89%	0%	12%	67%	21%	67%	25%	8%	0%	43%	57%	
	APP/DEPART	9	/	20	33	/	23	12	/	7	7	/	11	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	1	5	0	2	11	4	4	3	0	0	0	3	33
	APPROACH %	17%	83%	0%	12%	65%	24%	57%	43%	0%	0%	0%	100%	
	PEAK HR FACTOR		0.750			0.607			0.583			0.750		0.750
	APP/DEPART	6	/	12	17	/	11	7	/	5	3	/	5	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	1	0	2	1	1	1	0	1	0	0	0	7
	4:15 PM	0	3	0	0	0	0	1	0	0	0	0	0	4
	4:30 PM	0	4	0	0	0	2	0	0	0	0	0	1	7
	4:45 PM	0	1	1	1	1	0	0	1	1	0	0	0	6
	5:00 PM	0	3	0	1	1	1	0	0	0	0	1	1	8
	5:15 PM	1	5	0	0	0	1	0	2	0	0	0	0	9
	5:30 PM	0	1	0	1	0	0	0	0	1	0	0	1	4
	5:45 PM	0	3	0	0	1	1	0	2	0	0	0	0	7
	VOLUMES	1	21	1	5	4	6	2	5	3	0	1	3	52
	APPROACH %	4%	91%	4%	33%	27%	40%	20%	50%	30%	0%	25%	75%	
	APP/DEPART	23	/	26	15	/	7	10	/	11	4	/	8	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	1	13	1	2	2	4	0	3	1	0	1	2	30
	APPROACH %	7%	87%	7%	25%	25%	50%	0%	75%	25%	0%	33%	67%	
	PEAK HR FACTOR		0.625			0.667			0.500			0.375		0.833
	APP/DEPART	15	/	15	8	/	3	4	/	6	3	/	6	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	10
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 2	ER 0	WL 1	WT 1.5	WR 0.5	TOTAL
7:00 AM	1	5	0	0	10	2	2	2	2	0	0	1	25
7:15 AM	1	5	0	0	4	3	2	1	2	0	0	0	18
7:30 AM	1	4	0	2	5	8	3	0	2	1	0	2	28
7:45 AM	5	2	0	2	6	9	3	0	2	1	1	2	33
8:00 AM	4	8	0	1	11	9	7	0	0	0	0	0	40
8:15 AM	2	6	2	0	5	5	2	0	0	0	1	0	23
8:30 AM	0	8	1	0	11	6	6	2	1	1	0	0	36
8:45 AM	1	6	4	0	8	7	1	0	0	1	0	0	28
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	15	44	7	5	60	49	26	5	9	4	2	5	231
APPROACH %	23%	67%	11%	4%	53%	43%	65%	13%	23%	36%	18%	45%	
APP/DEPART	66	/	75	114	/	77	40	/	17	11	/	62	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	8	24	3	3	33	29	18	2	3	2	2	2	132
APPROACH %	21%	63%	8%	5%	51%	45%	78%	9%	13%	33%	33%	33%	
PEAK HR FACTOR		0.792			0.774			0.639			0.375		0.825
APP/DEPART	38	/	44	65	/	41	23	/	8	6	/	39	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	8	0	0	3	4	1	1	2	0	0	0	20
4:15 PM	0	6	1	0	4	4	1	0	0	0	0	0	16
4:30 PM	0	8	0	0	3	2	2	1	1	0	0	0	17
4:45 PM	0	5	0	0	4	1	5	1	0	0	0	0	16
5:00 PM	1	4	0	0	3	4	4	0	2	0	0	0	18
5:15 PM	0	6	1	0	4	2	5	0	0	0	1	0	19
5:30 PM	0	5	0	0	2	1	1	1	1	0	1	0	12
5:45 PM	0	2	1	0	3	1	0	1	2	0	0	0	10
VOLUMES	2	44	3	0	26	19	19	5	8	0	2	0	128
APPROACH %	4%	90%	6%	0%	58%	42%	59%	16%	25%	0%	100%	0%	
APP/DEPART	49	/	63	45	/	34	32	/	8	2	/	23	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	1	23	1	0	14	9	16	2	3	0	1	0	70
APPROACH %	4%	92%	4%	0%	61%	39%	76%	10%	14%	0%	100%	0%	
PEAK HR FACTOR		0.781			0.821			0.875			0.250		0.921
APP/DEPART	25	/	39	23	/	17	21	/	3	1	/	11	0

U-TURNS

NB	SB	EB	WB	TTL
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
2	0	0	0	2
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
4	0	0	0	4
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	2	0	0
0	2	0	0
0	1	0	0
0	1	1	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	7	1	0
0	6	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	1	0	0
0	0	1	0
2	2	1	0
1	0	0	0

Euclid

NORTH SIDE

Kimball WEST SIDE EAST SIDE **Kimball**

SOUTH SIDE

Euclid

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Euclid
EAST & WEST: Bickmore

PROJECT #: SC0916
LOCATION #: 11
CONTROL: SIGNAL

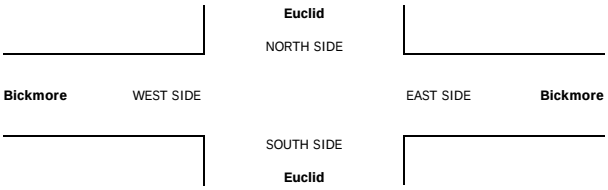
NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

Add U-Turns to Left Turns

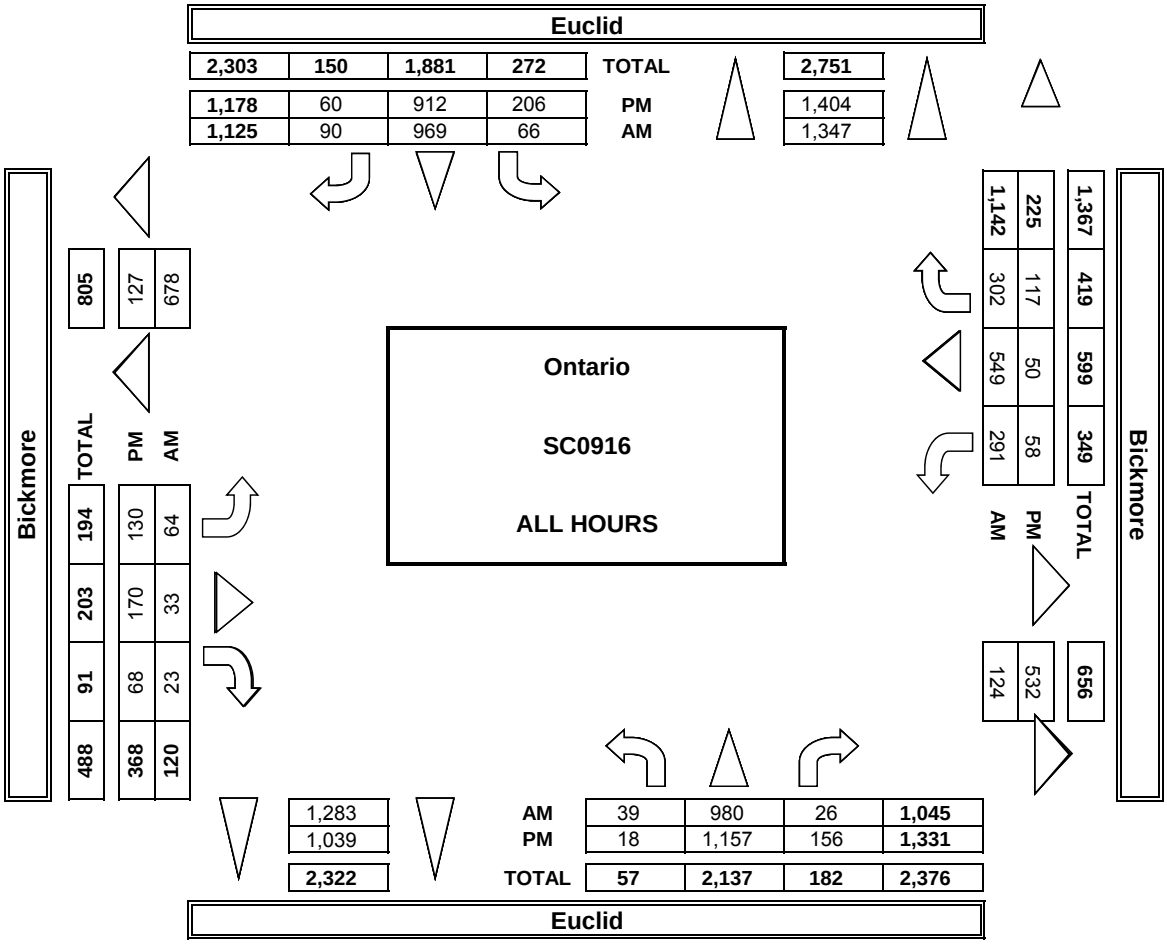
		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Bickmore)			WESTBOUND (Bickmore)				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	2	87	1	5	125	11	12	4	2	61	118	40	468	0	1	0	0	1	0	3	0	2
	7:15 AM	3	125	4	9	114	8	6	5	4	38	80	37	433	0	0	0	0	0	1	2	1	2
	7:30 AM	9	121	3	8	104	7	13	5	5	36	76	43	430	0	0	0	0	0	0	0	1	6
	7:45 AM	7	119	3	14	89	16	5	4	4	37	89	44	431	0	0	0	0	0	0	3	0	2
	8:00 AM	6	118	5	4	117	11	6	2	2	47	45	44	407	0	0	0	0	0	0	0	0	6
	8:15 AM	4	136	4	8	155	10	9	5	3	25	44	25	428	0	0	0	0	0	0	0	0	2
	8:30 AM	5	141	4	6	133	18	6	7	2	26	48	38	434	0	0	0	0	0	0	1	0	2
	8:45 AM	3	133	2	12	132	9	7	1	1	21	49	31	401	0	0	0	0	0	0	0	0	2
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	39	980	26	66	969	90	64	33	23	291	549	302	3,432	0	1	0	0	1	1	9	2	24
	APPROACH %	4%	94%	2%	6%	86%	8%	53%	28%	19%	25%	48%	26%										
	APP/DEPART	1,045	/	1,347	1,125	/	1,283	120	/	124	1,142	/	678	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	21	452	11	36	432	42	36	18	15	172	363	164	1,762						1	8	2	12
	APPROACH %	4%	93%	2%	7%	85%	8%	52%	26%	22%	25%	52%	23%										
	PEAK HR FACTOR		0.910			0.904			0.750			0.798		0.941									
	APP/DEPART	484	/	653	510	/	619	69	/	64	699	/	426	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	133	15	16	99	6	15	20	8	6	6	20	345	0	0	0	0	0	3	1	2	1
	4:15 PM	2	165	14	28	103	3	13	20	4	12	3	13	380	0	0	0	0	0	1	0	2	2
	4:30 PM	1	138	17	24	105	3	36	20	10	2	7	14	377	0	0	0	0	0	0	0	3	2
	4:45 PM	2	156	13	16	102	9	7	26	6	9	9	12	367	0	0	0	0	0	1	1	2	2
	5:00 PM	3	134	18	23	130	3	20	23	10	5	5	14	388	0	0	0	0	0	2	0	4	3
	5:15 PM	2	137	19	40	108	12	19	24	11	13	6	11	402	0	0	0	0	0	3	0	5	2
	5:30 PM	5	157	33	30	141	14	9	19	16	5	8	15	452	1	0	0	0	1	0	0	7	3
	5:45 PM	2	137	27	29	124	10	11	18	3	6	6	18	391	0	0	0	0	0	4	0	1	3
	VOLUMES	18	1,157	156	206	912	60	130	170	68	58	50	117	3,102	1	0	0	0	1	14	2	26	18
	APPROACH %	1%	87%	12%	17%	77%	5%	35%	46%	18%	26%	22%	52%										
	APP/DEPART	1,331	/	1,404	1,178	/	1,039	368	/	532	225	/	127	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	12	565	97	122	503	39	59	84	40	29	25	58	1,633						9	0	17	11
	APPROACH %	2%	84%	14%	18%	76%	6%	32%	46%	22%	26%	22%	52%										
	PEAK HR FACTOR		0.864			0.897			0.847			0.933		0.903									
	APP/DEPART	674	/	682	664	/	573	183	/	303	112	/	75	0									

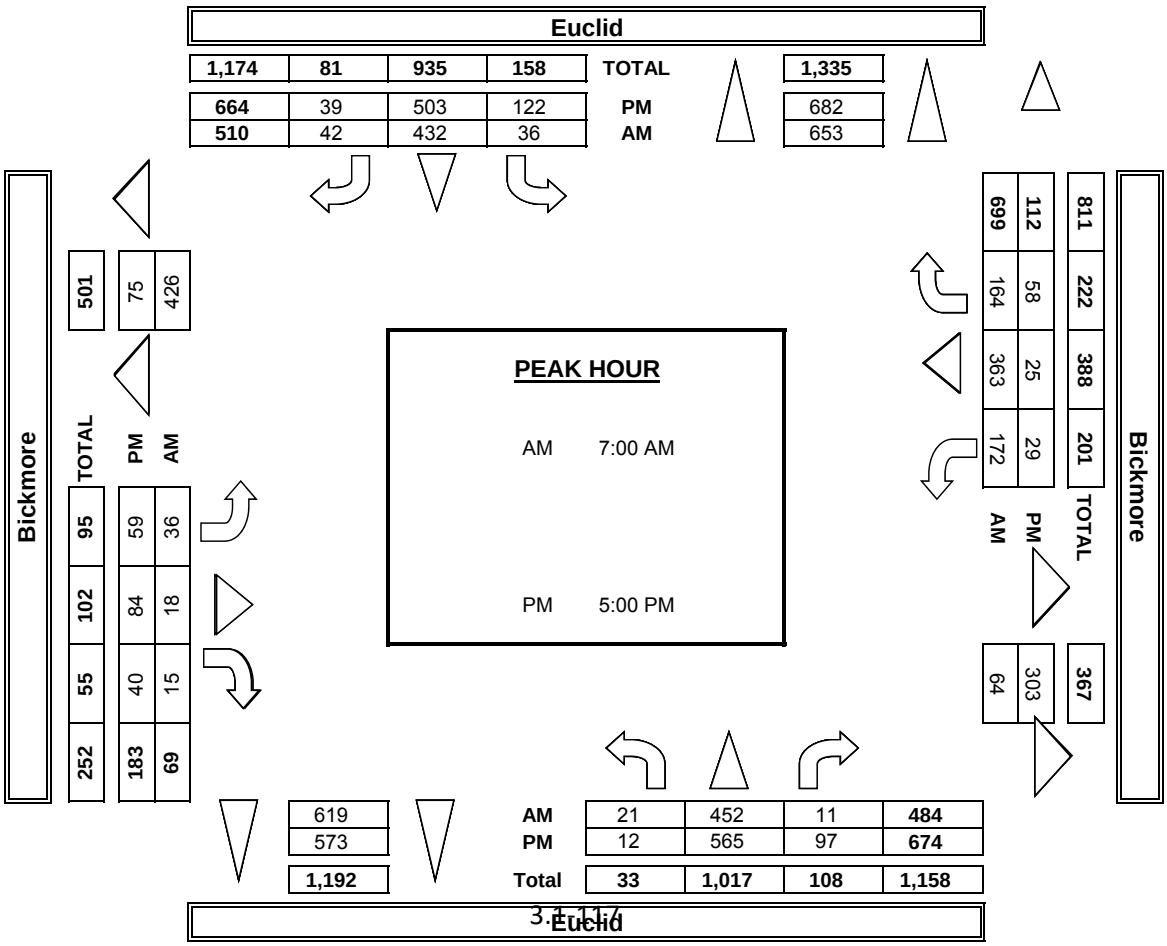


	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	1	1	0	0	2	0	0	0	0	0	1	1	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	1	1	0	3	0	0	1	0	1	1	1	0	0	2
PM 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	1	0	0	2	0	0	0	0	0	1	1	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	2	0	1	4	0	0	0	0	0	1	2	0	1	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	11
TUESDAY	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Bickmore)			WESTBOUND (Bickmore)			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	0	5	0	0	7	3	2	0	0	0	3	0	20
	7:15 AM	0	2	0	2	13	0	1	0	0	0	2	0	20
	7:30 AM	1	3	0	0	8	0	8	0	3	0	1	0	24
	7:45 AM	0	9	0	1	13	2	1	0	0	2	1	1	30
	8:00 AM	1	4	1	0	9	1	0	0	0	1	0	2	19
	8:15 AM	0	7	0	0	7	1	2	0	2	0	0	0	19
	8:30 AM	0	5	0	1	15	0	3	0	1	2	0	0	27
	8:45 AM	0	7	0	0	10	0	3	0	0	1	0	2	23
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	2	42	1	4	82	7	20	0	6	6	7	5	182
	APPROACH %	4%	93%	2%	4%	88%	8%	77%	0%	23%	33%	39%	28%	
	APP/DEPART	45	/	67	93	/	94	26	/	5	18	/	16	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	1	25	1	2	44	4	6	0	3	5	1	3	95
	APPROACH %	4%	93%	4%	4%	88%	8%	67%	0%	33%	56%	11%	33%	
	PEAK HR FACTOR		0.750			0.781			0.563			0.563		0.792
	APP/DEPART	27	/	34	50	/	52	9	/	3	9	/	6	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	10	1	0	8	1	1	0	1	0	0	3	25
	4:15 PM	0	18	0	0	6	0	1	0	1	0	0	0	26
	4:30 PM	1	14	0	2	5	0	3	0	0	0	0	0	25
	4:45 PM	0	11	0	0	9	1	1	0	0	0	0	0	22
	5:00 PM	1	7	0	2	5	0	0	0	0	1	0	1	17
	5:15 PM	0	10	1	0	5	1	1	2	0	0	1	0	21
	5:30 PM	0	9	0	0	5	0	1	0	0	0	0	2	17
	5:45 PM	0	7	0	1	3	0	0	0	0	0	0	1	12
	VOLUMES	2	86	2	5	46	3	8	2	2	1	1	7	165
	APPROACH %	2%	96%	2%	9%	85%	6%	67%	17%	17%	11%	11%	78%	
	APP/DEPART	90	/	101	54	/	49	12	/	9	9	/	6	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	1	53	1	2	28	2	6	0	2	0	0	3	98
	APPROACH %	2%	96%	2%	6%	88%	6%	75%	0%	25%	0%	0%	100%	
	PEAK HR FACTOR		0.764			0.800			0.667			0.250		0.942
	APP/DEPART	55	/	62	32	/	30	8	/	3	3	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	11
TUESDAY	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Bickmore)			WESTBOUND (Bickmore)			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
7:15 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
8:15 AM	1	2	0	0	0	0	0	0	0	0	0	0	3
8:30 AM	0	2	0	0	1	0	0	0	0	0	0	0	3
8:45 AM	0	2	0	1	2	0	0	0	1	0	1	1	8
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	7	0	1	5	0	0	0	1	0	2	3	20
APPROACH %	13%	88%	0%	17%	83%	0%	0%	0%	100%	0%	40%	60%	
APP/DEPART	8	/	10	6	/	6	1	/	1	5	/	3	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	1	7	0	1	4	0	0	0	1	0	1	1	16
APPROACH %	13%	88%	0%	20%	80%	0%	0%	0%	100%	0%	50%	50%	
PEAK HR FACTOR		0.667			0.417			0.250			0.250		0.500
APP/DEPART	8	/	8	5	/	5	1	/	1	2	/	2	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	4	0	0	0	0	0	0	0	0	0	1	5
4:15 PM	0	3	0	0	0	0	0	0	0	1	0	0	4
4:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	2
4:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
5:00 PM	0	2	0	0	1	0	0	0	0	0	0	0	3
5:15 PM	0	1	0	0	0	2	0	0	0	0	0	0	3
5:30 PM	0	1	1	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	1	0	0	0	0	0	0	1	2
VOLUMES	0	15	1	1	2	2	0	0	0	1	0	2	24
APPROACH %	0%	94%	6%	20%	40%	40%	0%	0%	0%	33%	0%	67%	
APP/DEPART	16	/	17	5	/	3	0	/	2	3	/	2	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	11	0	1	0	0	0	0	0	1	0	1	14
APPROACH %	0%	100%	0%	100%	0%	0%	0%	0%	0%	50%	0%	50%	
PEAK HR FACTOR		0.688			0.250			0.000			0.500		0.700
APP/DEPART	11	/	12	1	/	1	0	/	1	2	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	11
TUESDAY	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Bickmore)			WESTBOUND (Bickmore)			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
7:00 AM	0	7	0	2	4	1	5	0	2	0	0	0	21
7:15 AM	0	1	0	0	3	1	5	0	4	0	0	0	14
7:30 AM	0	0	0	0	4	0	4	0	1	1	0	1	11
7:45 AM	1	5	0	0	2	3	3	0	2	0	0	0	16
8:00 AM	0	2	0	0	6	4	4	0	1	1	0	0	18
8:15 AM	2	4	0	0	3	2	5	0	1	0	0	0	17
8:30 AM	0	6	0	0	8	5	2	0	1	0	0	1	23
8:45 AM	1	7	0	0	4	4	2	0	0	0	0	0	18
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	4	32	0	2	34	20	30	0	12	2	0	2	138
APPROACH %	11%	89%	0%	4%	61%	36%	71%	0%	29%	50%	0%	50%	
APP/DEPART	36	/	65	56	/	48	42	/	1	4	/	24	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	3	19	0	0	21	15	13	0	3	1	0	1	76
APPROACH %	14%	86%	0%	0%	58%	42%	81%	0%	19%	50%	0%	50%	
PEAK HR FACTOR		0.688			0.692			0.667			0.500		0.826
APP/DEPART	22	/	33	36	/	25	16	/	0	2	/	18	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	6	0	0	2	0	1	0	0	0	0	0	9
4:15 PM	0	4	0	0	2	0	2	0	0	0	0	0	8
4:30 PM	0	4	0	0	1	0	2	0	0	0	0	0	7
4:45 PM	0	5	0	0	1	4	1	0	0	1	0	0	12
5:00 PM	0	2	1	0	3	1	1	0	0	0	0	0	8
5:15 PM	0	7	0	0	0	2	0	1	0	0	0	0	10
5:30 PM	1	7	0	0	1	0	0	0	2	0	0	0	11
5:45 PM	0	1	0	0	4	1	0	0	0	1	0	0	7
VOLUMES	1	36	1	0	14	8	7	1	2	2	0	0	72
APPROACH %	3%	95%	3%	0%	64%	36%	70%	10%	20%	100%	0%	0%	
APP/DEPART	38	/	43	22	/	18	10	/	2	2	/	9	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	1	21	1	0	5	7	2	1	2	1	0	0	41
APPROACH %	4%	91%	4%	0%	42%	58%	40%	20%	40%	100%	0%	0%	
PEAK HR FACTOR		0.719			0.600			0.625			0.250		0.854
APP/DEPART	23	/	23	12	/	8	5	/	2	1	/	8	0

U-TURNS

NB	SB	EB	WB	TTL
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Euclid (NORTH SIDE)

Bickmore WEST SIDE — EAST SIDE **Bickmore**

SOUTH SIDE **Euclid**

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Euclid
EAST & WEST: Pine

PROJECT #: SC0916
LOCATION #: 12
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Pine)			WESTBOUND (Pine)				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 1.5	SR 0.5	EL 1	ET 1	ER 1	WL 2	WT 1	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	4	87	118	10	138	2	1	34	0	247	57	7	705	0	0	0	0	0	59	1	0	3
	7:15 AM	6	137	90	8	142	3	1	51	4	168	51	11	672	0	0	0	0	0	38	0	0	4
	7:30 AM	3	128	118	19	123	2	1	53	3	196	43	2	691	0	2	0	0	2	41	0	0	0
	7:45 AM	7	126	95	9	132	2	0	44	5	221	52	11	704	0	0	0	0	0	42	1	0	3
	8:00 AM	14	133	114	9	153	4	2	54	1	179	32	16	711	1	0	0	0	1	40	2	0	5
	8:15 AM	13	118	118	14	147	1	1	49	7	210	31	11	720	0	0	0	0	0	52	1	0	4
	8:30 AM	5	143	99	19	138	2	0	35	4	209	37	10	701	1	0	0	0	1	42	1	0	3
	8:45 AM	7	116	108	18	126	3	2	39	2	184	28	16	649	0	0	0	0	0	47	0	0	7
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	59	988	860	106	1,099	19	8	359	26	1,614	331	84	5,553	2	2	0	0	4	361	6	0	29
	APPROACH %	3%	52%	45%	9%	90%	2%	2%	91%	7%	80%	16%	4%										
	APP/DEPART	1,907	/	1,082	1,224	/	2,741	393	/	1,323	2,029	/	407	0									
	BEGIN PEAK HR		7:45 AM																				
	VOLUMES	39	520	426	51	570	9	3	182	17	819	152	48	2,836						176	5	0	15
	APPROACH %	4%	53%	43%	8%	90%	1%	1%	90%	8%	80%	15%	5%										
	PEAK HR FACTOR		0.943			0.949			0.886			0.897		0.985									
	APP/DEPART	985	/	571	630	/	1,408	202	/	659	1,019	/	198	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	3	162	254	14	105	3	0	66	6	99	19	12	743	0	1	0	0	1	89	0	0	3
	4:15 PM	2	156	250	14	91	1	3	47	3	84	14	7	672	0	0	0	0	0	85	0	0	3
	4:30 PM	4	156	262	15	94	1	1	66	9	113	23	5	749	0	1	0	0	1	103	0	0	1
	4:45 PM	6	147	256	11	115	3	2	78	4	77	15	9	723	0	0	0	0	0	85	2	0	5
	5:00 PM	5	140	222	17	111	2	6	87	6	103	19	6	724	1	0	0	0	1	98	2	0	2
	5:15 PM	5	137	254	13	128	7	2	79	6	104	13	9	757	0	0	0	0	0	99	1	0	1
	5:30 PM	6	176	265	13	125	3	2	70	5	98	21	4	788	0	0	0	0	0	106	1	0	1
	5:45 PM	5	154	257	12	104	2	2	81	8	129	18	5	777	0	0	0	0	0	117	0	0	2
	VOLUMES	36	1,228	2,020	109	873	22	18	574	47	807	142	57	5,933	1	2	0	0	3	782	6	0	18
	APPROACH %	1%	37%	62%	11%	87%	2%	3%	90%	7%	80%	14%	6%										
	APP/DEPART	3,284	/	1,305	1,004	/	1,728	639	/	2,701	1,006	/	199	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	21	607	998	55	468	14	12	317	25	434	71	24	3,046						420	4	0	6
	APPROACH %	1%	37%	61%	10%	87%	3%	3%	90%	7%	82%	13%	5%										
	PEAK HR FACTOR		0.909			0.907			0.894			0.870		0.966									
	APP/DEPART	1,626	/	643	537	/	928	354	/	1,370	529	/	105	0									

Euclid

NORTH SIDE

Pine WEST SIDE EAST SIDE **Pine**

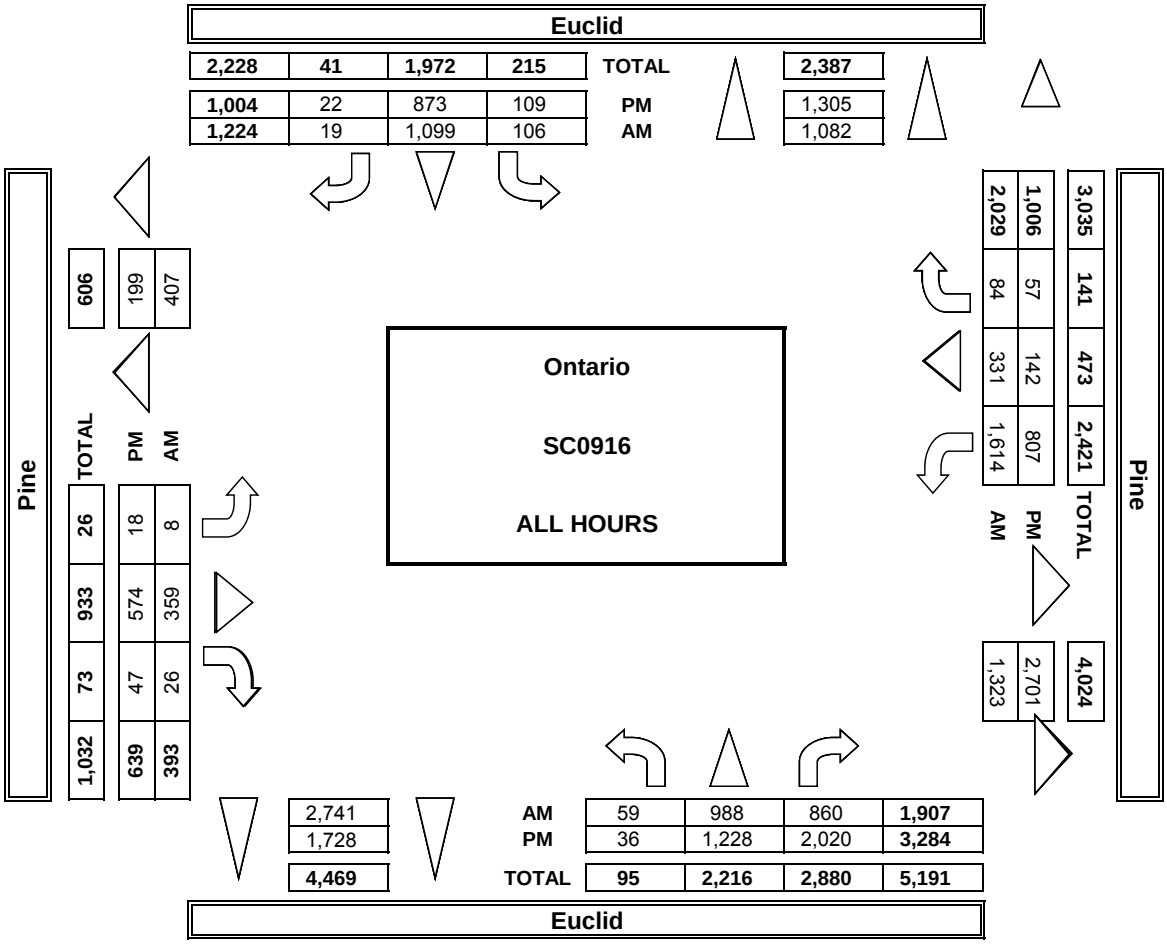
SOUTH SIDE

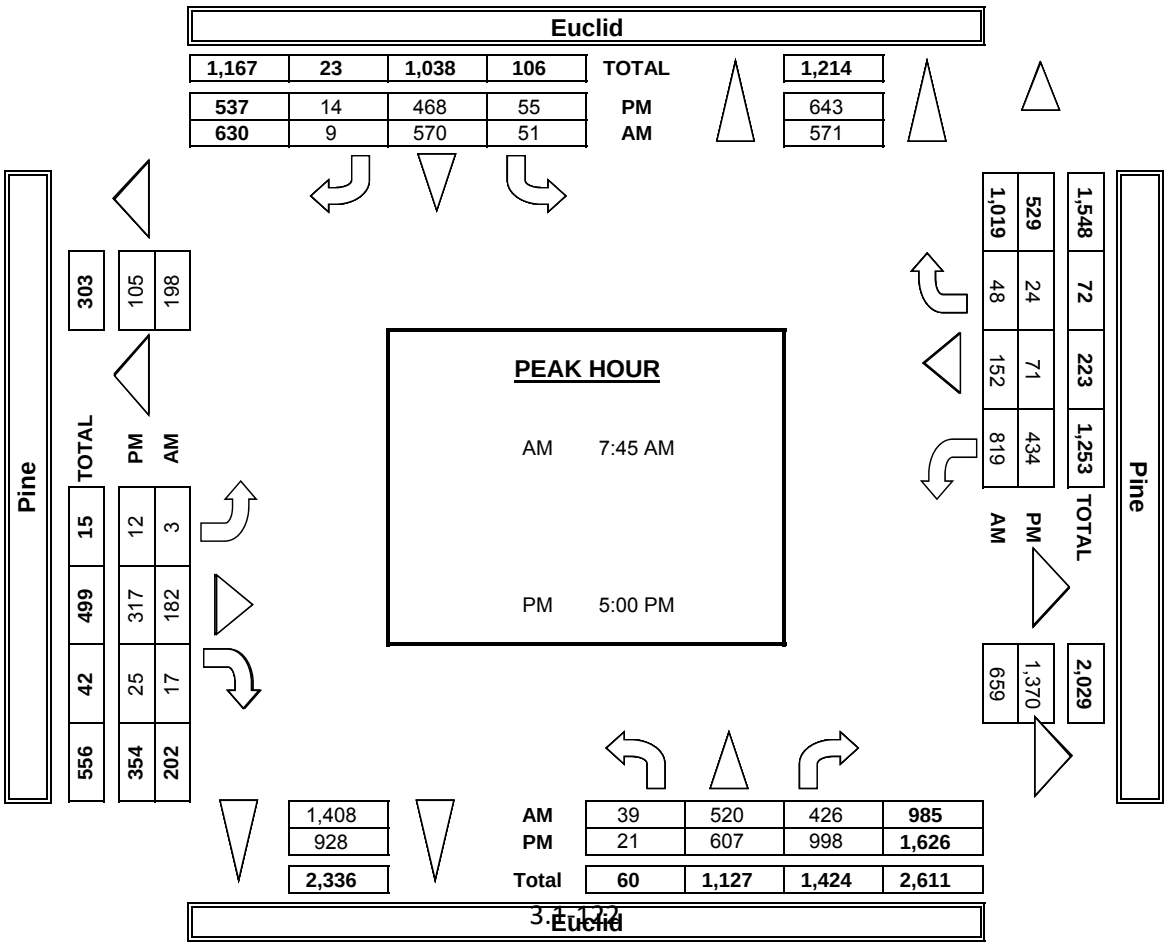
Euclid

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	2	1	0	1	4	0	0	0	0	0	2	1	0	1	4
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	2	1	0	1	4	0	0	0	0	0	2	1	0	1	4
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	6	0	0	6	0	0	0	0	0	0	6	0	0	6

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	12
TUESDAY	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Pine)			WESTBOUND (Pine)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 1.5	SR 0.5	EL 1	ET 1	ER 1	WL 2	WT 1	WR 0	TOTAL
AM	7:00 AM	0	2	8	1	2	0	0	0	1	1	0	0	15
	7:15 AM	1	3	3	1	8	0	0	0	0	5	0	1	22
	7:30 AM	0	4	8	1	9	0	1	4	2	4	0	0	33
	7:45 AM	0	6	8	2	10	1	0	1	1	1	0	1	31
	8:00 AM	1	6	5	1	9	1	0	0	0	2	1	1	27
	8:15 AM	0	5	6	1	10	0	0	3	2	0	0	2	29
	8:30 AM	0	3	4	2	10	0	0	0	0	2	1	0	22
	8:45 AM	0	3	4	1	6	0	0	0	0	4	2	1	21
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	2	32	46	10	64	2	1	8	6	19	4	6	200
	APPROACH %	3%	40%	58%	13%	84%	3%	7%	53%	40%	66%	14%	21%	
	APP/DEPART	80	/	39	76	/	89	15	/	64	29	/	8	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	1	21	27	5	38	2	1	8	5	7	1	4	120
	APPROACH %	2%	43%	55%	11%	84%	4%	7%	57%	36%	58%	8%	33%	
	PEAK HR FACTOR		0.875			0.865			0.500			0.750		0.909
	APP/DEPART	49	/	26	45	/	50	14	/	40	12	/	4	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	8	5	0	2	0	0	1	1	2	2	1	22
	4:15 PM	0	9	6	0	3	0	0	0	0	1	0	0	19
	4:30 PM	0	10	7	0	3	0	0	1	0	1	0	0	22
	4:45 PM	0	13	10	0	4	0	0	0	0	1	0	0	28
	5:00 PM	1	14	7	1	3	0	0	1	1	4	0	0	32
	5:15 PM	0	9	3	0	5	0	0	2	0	2	0	1	22
	5:30 PM	0	4	7	0	4	0	0	0	0	2	0	1	18
	5:45 PM	0	5	2	1	4	0	0	1	0	0	0	0	13
	VOLUMES	1	72	47	2	28	0	0	6	2	13	2	3	176
	APPROACH %	1%	60%	39%	7%	93%	0%	0%	75%	25%	72%	11%	17%	
	APP/DEPART	120	/	75	30	/	43	8	/	55	18	/	3	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	1	46	27	1	15	0	0	4	1	8	0	1	104
	APPROACH %	1%	62%	36%	6%	94%	0%	0%	80%	20%	89%	0%	11%	
	PEAK HR FACTOR		0.804			0.800			0.625			0.563		0.813
	APP/DEPART	74	/	47	16	/	24	5	/	32	9	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	12
TUESDAY	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

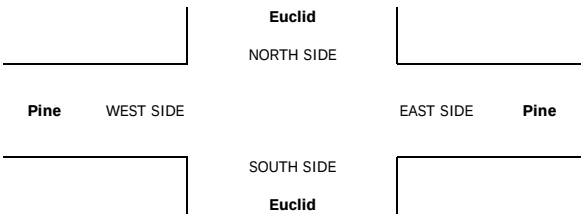
		NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Pine)			WESTBOUND (Pine)			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 1.5	SR 0.5	EL 1	ET 1	ER 1	WL 2	WT 1	WR 0	TOTAL
AM	7:00 AM	0	1	1	0	1	0	0	1	0	1	0	0	5
	7:15 AM	0	0	0	1	1	1	0	3	0	3	0	0	9
	7:30 AM	0	1	4	0	0	0	0	4	0	5	0	0	14
	7:45 AM	0	2	1	0	0	0	0	1	0	1	0	1	6
	8:00 AM	0	0	3	0	0	0	1	3	0	0	0	0	7
	8:15 AM	0	1	2	0	1	0	0	4	0	4	2	1	15
	8:30 AM	0	1	1	0	0	0	0	1	0	0	1	0	4
	8:45 AM	0	1	1	1	0	0	0	0	0	2	0	0	5
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	7	13	2	3	1	1	17	0	16	3	2	65
	APPROACH %	0%	35%	65%	33%	50%	17%	6%	94%	0%	76%	14%	10%	
	APP/DEPART	20	/	10	6	/	19	18	/	32	21	/	4	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	0	4	10	0	1	0	1	12	0	10	2	2	42
	APPROACH %	0%	29%	71%	0%	100%	0%	8%	92%	0%	71%	14%	14%	
	PEAK HR FACTOR		0.700			0.250			0.813			0.500		0.700
	APP/DEPART	14	/	7	1	/	11	13	/	22	14	/	2	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	4	0	0	0	0	0	1	0	3	0	0	8
	4:15 PM	0	3	1	0	0	0	0	0	0	0	0	0	4
	4:30 PM	1	3	1	0	0	0	0	1	0	0	0	0	6
	4:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
	5:00 PM	0	0	1	1	1	0	0	0	0	0	0	0	3
	5:15 PM	1	2	0	0	0	0	0	0	0	0	0	0	3
	5:30 PM	1	3	1	0	1	0	0	0	0	0	0	0	6
	5:45 PM	1	0	0	0	0	0	0	0	0	1	0	0	2
	VOLUMES	4	17	4	1	2	0	0	2	0	4	0	0	34
	APPROACH %	16%	68%	16%	33%	67%	0%	0%	100%	0%	100%	0%	0%	
	APP/DEPART	25	/	17	3	/	6	2	/	7	4	/	4	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	1	12	2	0	0	0	0	2	0	3	0	0	20
	APPROACH %	7%	80%	13%	0%	0%	0%	0%	100%	0%	100%	0%	0%	
	PEAK HR FACTOR		0.750			0.000			0.500			0.250		0.625
	APP/DEPART	15	/	12	0	/	3	2	/	4	3	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
3	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
4	0	0	0
3	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Euclid	LOCATION #:	12
TUESDAY	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

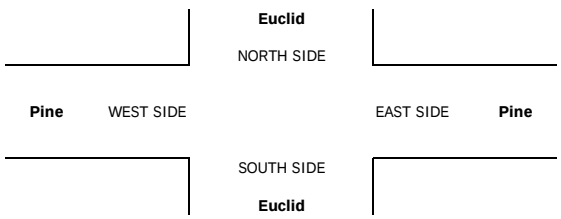
	NORTHBOUND (Euclid)			SOUTHBOUND (Euclid)			EASTBOUND (Pine)			WESTBOUND (Pine)			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 1.5	SR 0.5	EL 1	ET 1	ER 1	WL 2	WT 1	WR 0	TOTAL
7:00 AM	0	2	0	0	4	0	1	1	0	0	1	0	9
7:15 AM	0	1	2	0	6	0	0	0	1	0	0	0	10
7:30 AM	0	6	3	0	6	1	0	1	0	1	0	0	18
7:45 AM	1	5	1	0	5	0	0	3	3	1	0	0	19
8:00 AM	3	2	3	0	6	1	0	1	0	1	2	1	20
8:15 AM	3	3	1	0	3	0	0	0	2	1	0	0	13
8:30 AM	1	6	5	1	3	1	0	1	1	1	0	1	21
8:45 AM	2	4	2	0	3	0	0	2	0	1	0	0	14
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	10	29	17	1	36	3	1	9	7	6	3	2	124
APPROACH %	18%	52%	30%	3%	90%	8%	6%	53%	41%	55%	27%	18%	
APP/DEPART	56	/	32	40	/	49	17	/	27	11	/	16	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	8	16	10	1	17	2	0	5	6	4	2	2	73
APPROACH %	24%	47%	29%	5%	85%	10%	0%	45%	55%	50%	25%	25%	
PEAK HR FACTOR		0.708			0.714			0.458			0.500		0.869
APP/DEPART	34	/	18	20	/	27	11	/	16	8	/	12	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	2	2	0	0	1	0	0	0	0	1	0	2	8
4:15 PM	1	4	2	0	4	0	1	0	0	0	0	0	12
4:30 PM	1	2	1	0	5	0	0	1	1	1	0	0	12
4:45 PM	1	5	1	0	2	0	0	0	0	0	0	0	9
5:00 PM	0	2	0	0	2	0	0	0	0	1	0	0	5
5:15 PM	1	2	0	0	0	0	0	0	1	0	0	2	6
5:30 PM	0	6	0	0	3	0	1	0	1	0	0	0	11
5:45 PM	1	1	0	0	2	0	0	0	0	0	0	0	4
VOLUMES	7	24	4	0	19	0	2	1	3	3	0	4	67
APPROACH %	20%	69%	11%	0%	100%	0%	33%	17%	50%	43%	0%	57%	
APP/DEPART	35	/	30	19	/	25	6	/	5	7	/	7	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	5	13	4	0	12	0	1	1	1	2	0	2	41
APPROACH %	23%	59%	18%	0%	100%	0%	33%	33%	33%	50%	0%	50%	
PEAK HR FACTOR		0.786			0.600			0.375			0.333		0.854
APP/DEPART	22	/	16	12	/	15	3	/	5	4	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
1	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
2	0	0	1
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
5	0	0	1
2	0	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
1	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
2	0	0	1
2	0	0	1



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: SR-71 NB Ramp
EAST & WEST: Euclid

PROJECT #: SC0916
LOCATION #: 13
CONTROL: SIGNAL

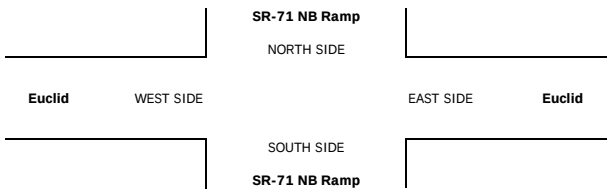
NOTES:

AM / PM / MD / OTHER / OTHER

N / W / E / S

Add U-Turns to Left Turns

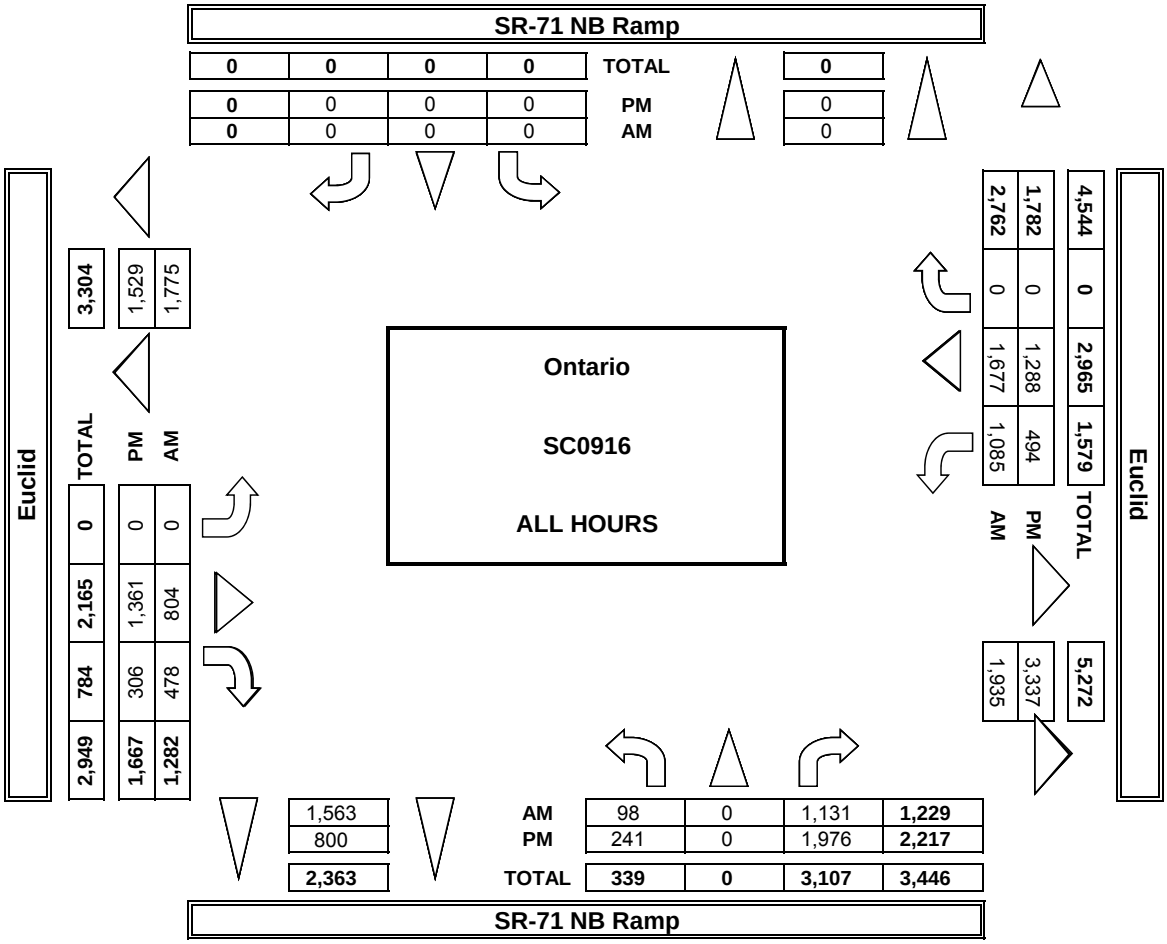
		NORTHBOUND SR-71 NB Ramp			SOUTHBOUND SR-71 NB Ramp			EASTBOUND Euclid			WESTBOUND Euclid				U-TURNS					RTOR			
	LANES:	NL 2	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 1	WL 1	WT 2	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	8	0	104	0	0	0	0	99	55	148	250	0	664	0	0	0	0	0	0	0	0	0
	7:15 AM	9	0	150	0	0	0	0	71	48	144	211	0	633	0	0	0	0	0	0	0	0	0
	7:30 AM	10	0	160	0	0	0	0	123	46	128	157	0	624	0	0	0	0	0	0	0	0	0
	7:45 AM	9	0	141	0	0	0	0	92	55	149	192	0	638	0	0	0	0	0	0	0	0	0
	8:00 AM	19	0	181	0	0	0	0	101	57	127	225	0	710	0	0	0	0	0	0	0	0	0
	8:15 AM	13	0	145	0	0	0	0	112	46	130	221	0	667	0	0	0	0	0	0	0	0	0
	8:30 AM	15	0	116	0	0	0	0	117	90	120	238	0	696	0	0	0	0	0	0	0	0	0
	8:45 AM	15	0	134	0	0	0	0	89	81	139	183	0	641	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	98	0	1,131	0	0	0	0	804	478	1,085	1,677	0	5,273	0	0	0	0	0	0	0	0	0
	APPROACH %	8%	0%	92%	0%	0%	0%	0%	63%	37%	39%	61%	0%										
	APP/DEPART	1,229	/	0	0	/	1,563	1,282	/	1,935	2,762	/	1,775	0									
	BEGIN PEAK HR		8:00 AM																				
	VOLUMES	62	0	576	0	0	0	0	419	274	516	867	0	2,714						0	0	0	0
	APPROACH %	10%	0%	90%	0%	0%	0%	0%	60%	40%	37%	63%	0%										
	PEAK HR FACTOR		0.798			0.000			0.837			0.966		0.956									
	APP/DEPART	638	/	0	0	/	790	693	/	995	1,383	/	929	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	20	0	230	0	0	0	0	173	34	53	170	0	680	0	0	0	0	0	0	0	0	0
	4:15 PM	19	0	242	0	0	0	0	171	30	46	143	0	651	0	0	0	0	0	0	0	0	0
	4:30 PM	32	0	271	0	0	0	0	168	34	62	136	0	703	0	0	0	0	0	0	0	0	0
	4:45 PM	28	0	242	0	0	0	0	152	40	53	154	0	669	0	0	0	0	0	0	0	0	0
	5:00 PM	35	0	243	0	0	0	0	156	39	60	169	0	702	0	0	0	0	0	0	0	0	0
	5:15 PM	27	0	244	0	0	0	0	208	40	76	172	0	767	0	0	0	0	0	0	0	0	0
	5:30 PM	38	0	261	0	0	0	0	179	49	73	155	0	755	0	0	0	0	0	0	0	0	0
	5:45 PM	42	0	243	0	0	0	0	154	40	71	189	0	739	0	0	0	0	0	0	0	0	0
	VOLUMES	241	0	1,976	0	0	0	0	1,361	306	494	1,288	0	5,666	0	0	0	0	0	0	0	0	0
	APPROACH %	11%	0%	89%	0%	0%	0%	0%	82%	18%	28%	72%	0%										
	APP/DEPART	2,217	/	0	0	/	800	1,667	/	3,337	1,782	/	1,529	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	142	0	991	0	0	0	0	697	168	280	685	0	2,963						0	0	0	0
	APPROACH %	13%	0%	87%	0%	0%	0%	0%	81%	19%	29%	71%	0%										
	PEAK HR FACTOR		0.947			0.000			0.872			0.928		0.966									
	APP/DEPART	1,133	/	0	0	/	448	865	/	1,688	965	/	827	0									

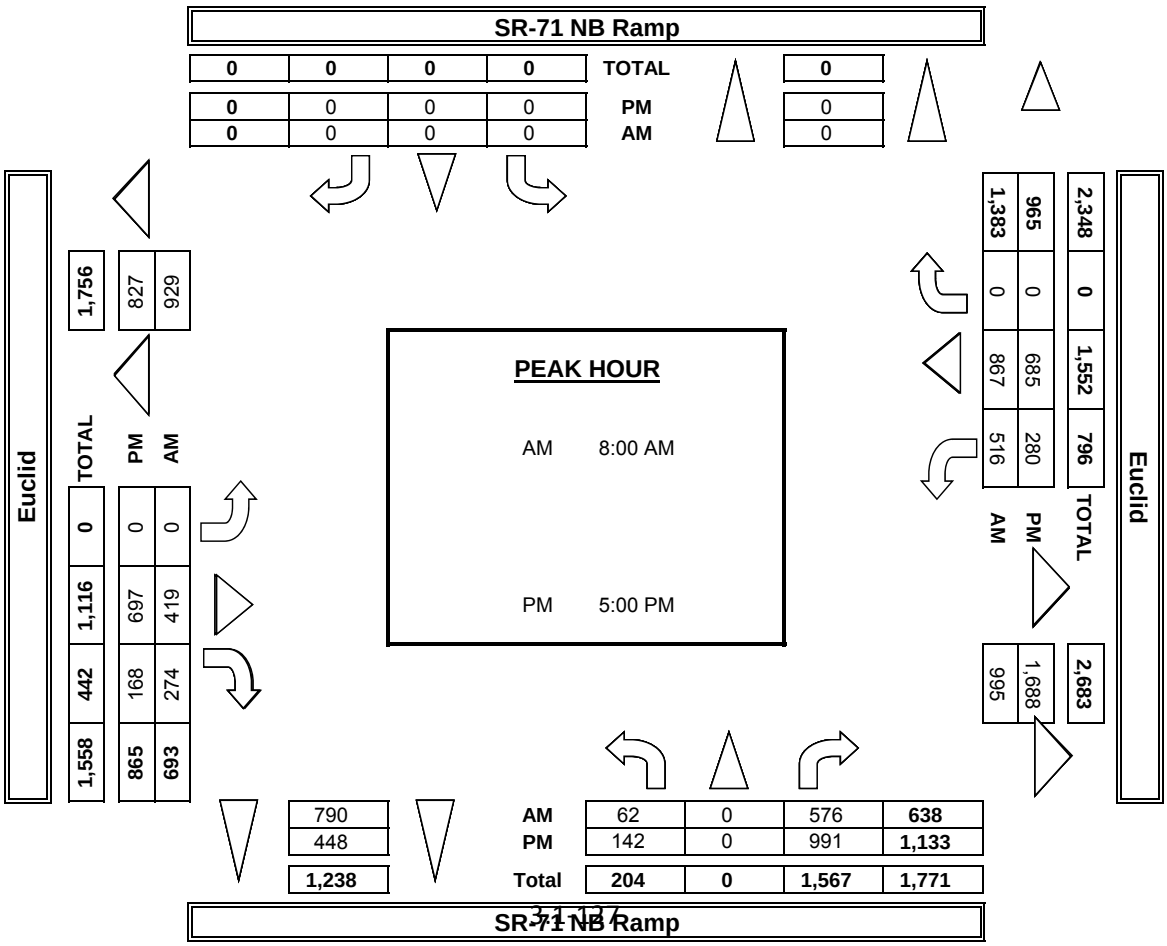


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	SR-71 NB Ramp	LOCATION #:	13
TUESDAY	EAST & WEST:	Euclid	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND SR-71 NB Ramp			SOUTHBOUND SR-71 NB Ramp			EASTBOUND Euclid			WESTBOUND Euclid			
LANES:	NL 2	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 1	WL 1	WT 2	WR X	TOTAL
7:00 AM	0	0	3	0	0	0	0	1	2	1	7	0	14
7:15 AM	0	0	7	0	0	0	0	0	2	1	12	0	22
7:30 AM	0	0	2	0	0	0	0	6	4	2	14	0	28
7:45 AM	0	0	6	0	0	0	0	4	2	2	15	0	29
8:00 AM	0	0	6	0	0	0	0	0	0	0	9	0	15
8:15 AM	0	0	11	0	0	0	0	7	1	2	10	0	31
8:30 AM	1	0	1	0	0	0	0	2	0	1	10	0	15
8:45 AM	0	0	6	0	0	0	0	5	2	3	11	0	27
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	0	42	0	0	0	0	25	13	12	88	0	181
APPROACH %	2%	0%	98%	0%	0%	0%	0%	66%	34%	12%	88%	0%	
APP/DEPART	43	/	0	0	/	25	38	/	67	100	/	89	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	0	0	25	0	0	0	0	17	7	6	48	0	103
APPROACH %	0%	0%	100%	0%	0%	0%	0%	71%	29%	11%	89%	0%	
PEAK HR FACTOR		0.568			0.000			0.600			0.794		0.831
APP/DEPART	25	/	0	0	/	13	24	/	42	54	/	48	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	15	0	0	0	0	4	1	0	4	0	24
4:15 PM	3	0	10	0	0	0	0	6	0	2	5	0	26
4:30 PM	0	0	18	0	0	0	0	3	0	3	1	0	25
4:45 PM	0	0	10	0	0	0	0	3	0	0	3	0	16
5:00 PM	0	0	12	0	0	0	0	3	0	2	5	0	22
5:15 PM	0	0	7	0	0	0	0	4	0	0	4	0	15
5:30 PM	1	0	11	0	0	0	0	3	1	0	0	0	16
5:45 PM	0	0	5	0	0	0	0	2	1	1	2	0	11
VOLUMES	4	0	88	0	0	0	0	28	3	8	24	0	155
APPROACH %	4%	0%	96%	0%	0%	0%	0%	90%	10%	25%	75%	0%	
APP/DEPART	92	/	0	0	/	11	31	/	116	32	/	28	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	3	0	53	0	0	0	0	16	1	5	13	0	91
APPROACH %	5%	0%	95%	0%	0%	0%	0%	94%	6%	28%	72%	0%	
PEAK HR FACTOR		0.778			0.000			0.708			0.643		0.875
APP/DEPART	56	/	0	0	/	6	17	/	69	18	/	16	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	SR-71 NB Ramp	LOCATION #:	13
TUESDAY	EAST & WEST:	Euclid	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

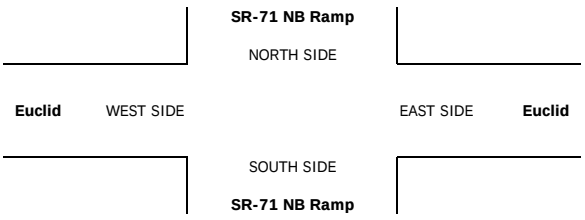
	NORTHBOUND SR-71 NB Ramp			SOUTHBOUND SR-71 NB Ramp			EASTBOUND Euclid			WESTBOUND Euclid			
LANES:	NL 2	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 1	WL 1	WT 2	WR X	TOTAL
7:00 AM	1	0	0	0	0	0	0	1	0	1	0	0	3
7:15 AM	0	0	0	0	0	0	0	0	0	2	1	0	3
7:30 AM	0	0	1	0	0	0	0	4	0	2	1	0	8
7:45 AM	0	0	1	0	0	0	0	0	0	0	1	0	2
8:00 AM	0	0	2	0	0	0	0	2	0	0	1	0	5
8:15 AM	1	0	1	0	0	0	0	0	0	2	1	0	5
8:30 AM	2	0	0	0	0	0	0	0	0	1	2	0	5
8:45 AM	0	0	2	0	0	0	0	0	0	2	2	0	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	4	0	7	0	0	0	0	7	0	10	9	0	37
APPROACH %	36%	0%	64%	0%	0%	0%	0%	100%	0%	53%	47%	0%	
APP/DEPART	11	/	0	0	/	10	7	/	14	19	/	13	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	3	0	5	0	0	0	0	2	0	5	6	0	21
APPROACH %	38%	0%	63%	0%	0%	0%	0%	100%	0%	45%	55%	0%	
PEAK HR FACTOR		1.000			0.000			0.250			0.688		0.875
APP/DEPART	8	/	0	0	/	5	2	/	7	11	/	9	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	1	0	0	0	0	1	0	0	5	0	8
4:15 PM	0	0	2	0	0	0	0	2	0	0	0	0	4
4:30 PM	0	0	2	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	3	0	0	0	0	0	0	0	1	0	4
5:00 PM	0	0	1	0	0	0	0	1	0	0	2	0	4
5:15 PM	0	0	3	0	0	0	0	3	0	0	0	0	6
5:30 PM	0	0	6	0	0	0	0	1	0	0	1	0	8
5:45 PM	0	0	1	0	0	0	0	1	0	1	0	0	3
VOLUMES	1	0	19	0	0	0	0	9	0	1	9	0	39
APPROACH %	5%	0%	95%	0%	0%	0%	0%	100%	0%	10%	90%	0%	
APP/DEPART	20	/	0	0	/	1	9	/	28	10	/	10	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	0	0	13	0	0	0	0	5	0	0	4	0	22
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.542			0.000			0.417			0.500		0.688
APP/DEPART	13	/	0	0	/	0	5	/	18	4	/	4	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	SR-71 NB Ramp	LOCATION #:	13
TUESDAY	EAST & WEST:	Euclid	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND SR-71 NB Ramp			SOUTHBOUND SR-71 NB Ramp			EASTBOUND Euclid			WESTBOUND Euclid			
LANES:	NL 2	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 1	WL 1	WT 2	WR X	TOTAL
7:00 AM	0	0	1	0	0	0	0	2	0	1	4	0	8
7:15 AM	0	0	2	0	0	0	0	1	1	2	5	0	11
7:30 AM	0	0	0	0	0	0	0	9	0	4	2	0	15
7:45 AM	0	0	2	0	0	0	0	1	0	3	2	0	8
8:00 AM	0	0	5	0	0	0	0	3	1	6	3	0	18
8:15 AM	0	0	4	0	0	0	0	3	1	4	3	0	15
8:30 AM	1	0	9	0	0	0	0	9	0	3	7	0	29
8:45 AM	0	0	6	0	0	0	0	3	0	1	3	0	13
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	0	29	0	0	0	0	31	3	24	29	0	117
APPROACH %	3%	0%	97%	0%	0%	0%	0%	91%	9%	45%	55%	0%	
APP/DEPART	30	/	0	0	/	27	34	/	60	53	/	30	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	1	0	24	0	0	0	0	18	2	14	16	0	75
APPROACH %	4%	0%	96%	0%	0%	0%	0%	90%	10%	47%	53%	0%	
PEAK HR FACTOR		0.625			0.000			0.556			0.750		0.647
APP/DEPART	25	/	0	0	/	16	20	/	42	30	/	17	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	5	0	0	0	0	1	0	1	2	0	10
4:15 PM	0	0	3	0	0	0	0	2	0	0	0	0	5
4:30 PM	0	0	3	0	0	0	0	2	0	0	1	0	6
4:45 PM	0	0	6	0	0	0	0	2	0	2	3	0	13
5:00 PM	0	0	5	0	0	0	0	0	0	1	2	0	8
5:15 PM	0	0	5	0	0	0	0	2	0	0	2	0	9
5:30 PM	1	0	3	0	0	0	0	1	0	0	4	0	9
5:45 PM	0	0	1	0	0	0	0	1	0	1	3	0	6
VOLUMES	2	0	31	0	0	0	0	11	0	5	17	0	66
APPROACH %	6%	0%	94%	0%	0%	0%	0%	100%	0%	23%	77%	0%	
APP/DEPART	33	/	0	0	/	5	11	/	42	22	/	19	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	1	0	19	0	0	0	0	5	0	3	11	0	39
APPROACH %	5%	0%	95%	0%	0%	0%	0%	100%	0%	21%	79%	0%	
PEAK HR FACTOR		0.833			0.000			0.625			0.700		0.750
APP/DEPART	20	/	0	0	/	3	5	/	24	14	/	12	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: SR-71 SB Ramp
EAST & WEST: Butterfield

PROJECT #: SC0916
LOCATION #: 14
CONTROL: STOP ALL

NOTES:

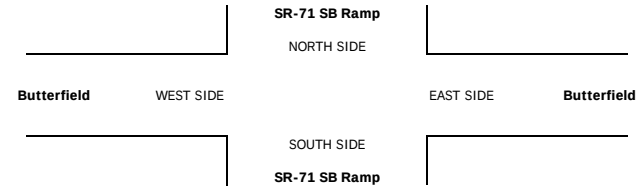
AM - queue EB and WB.

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

Add U-Turns to Left Turns

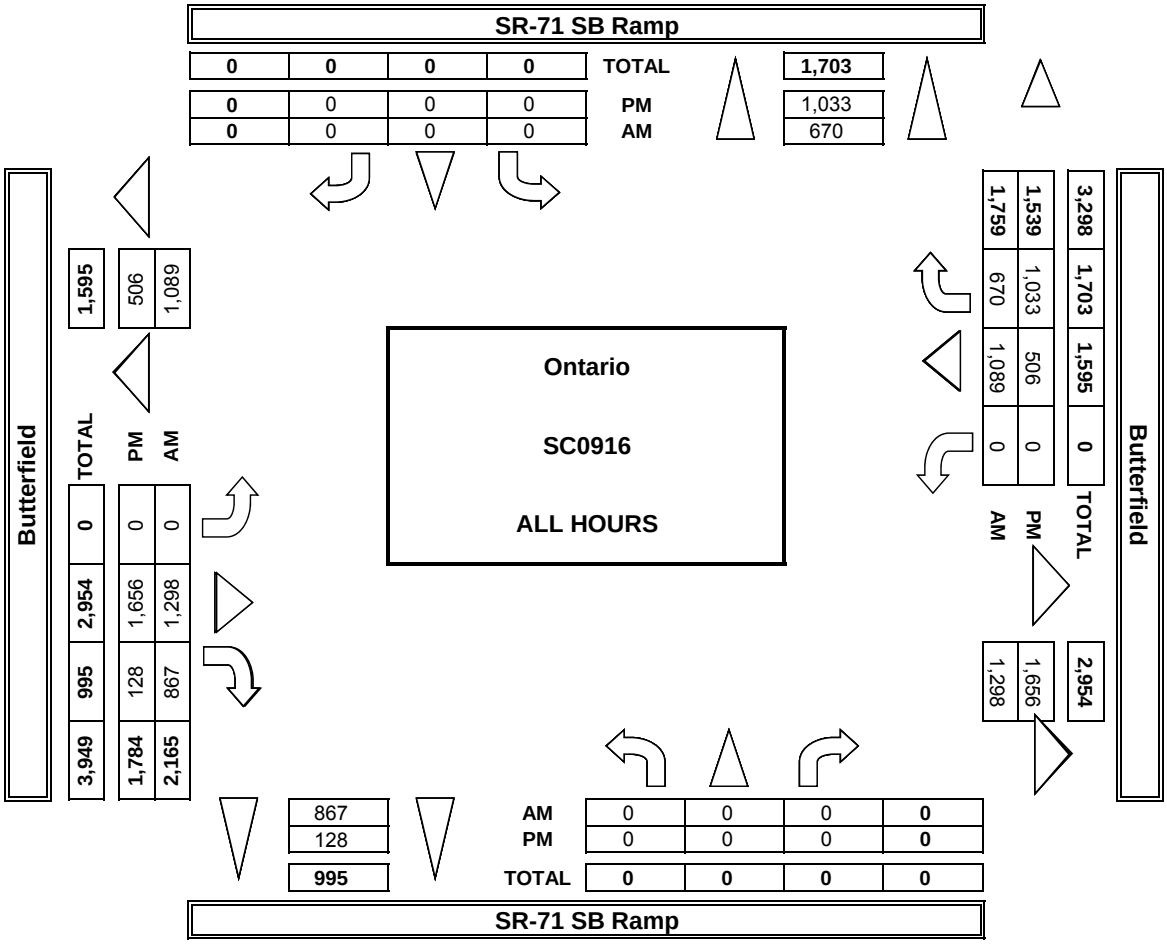
		NORTHBOUND SR-71 SB Ramp			SOUTHBOUND SR-71 SB Ramp			EASTBOUND Butterfield			WESTBOUND Butterfield				U-TURNS					RTOR			
	LANES:	NL X	NT X	NR X	SL X	ST X	SR X	EL X	ET 2	ER 2	WL X	WT 2	WR 2	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	0	0	0	0	0	0	160	86	0	159	76	481	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	122	97	0	137	82	438	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	153	83	0	114	61	411	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	148	90	0	113	93	444	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	154	106	0	144	84	488	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	162	120	0	141	112	535	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	215	133	0	147	93	588	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	184	152	0	134	69	539	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	1,298	867	0	1,089	670	3,924	0	0	0	0	0	0	0	0	0
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	60%	40%	0%	62%	38%										
	APP/DEPART	0	/	670	0	/	867	2,165	/	1,298	1,759	/	1,089	0									
	BEGIN PEAK HR		8:00 AM																				
	VOLUMES	0	0	0	0	0	0	0	715	511	0	566	358	2,150						0	0	0	0
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	58%	42%	0%	61%	39%										
	PEAK HR FACTOR		0.000			0.000			0.881			0.913		0.914									
	APP/DEPART	0	/	358	0	/	511	1,226	/	715	924	/	566	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	155	17	0	37	109	318	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	226	13	0	67	120	426	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	202	17	0	50	126	395	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	191	16	0	66	124	397	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	196	17	0	60	136	409	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	267	12	0	64	152	495	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	214	20	0	74	137	445	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	205	16	0	88	129	438	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	1,656	128	0	506	1,033	3,323	0	0	0	0	0	0	0	0	0
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	93%	7%	0%	33%	67%										
	APP/DEPART	0	/	1,033	0	/	128	1,784	/	1,656	1,539	/	506	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	0	0	0	0	0	0	0	882	65	0	286	554	1,787						0	0	0	0
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	93%	7%	0%	34%	66%										
	PEAK HR FACTOR		0.000			0.000			0.849			0.968		0.903									
	APP/DEPART	0	/	554	0	/	65	947	/	882	840	/	286	0									

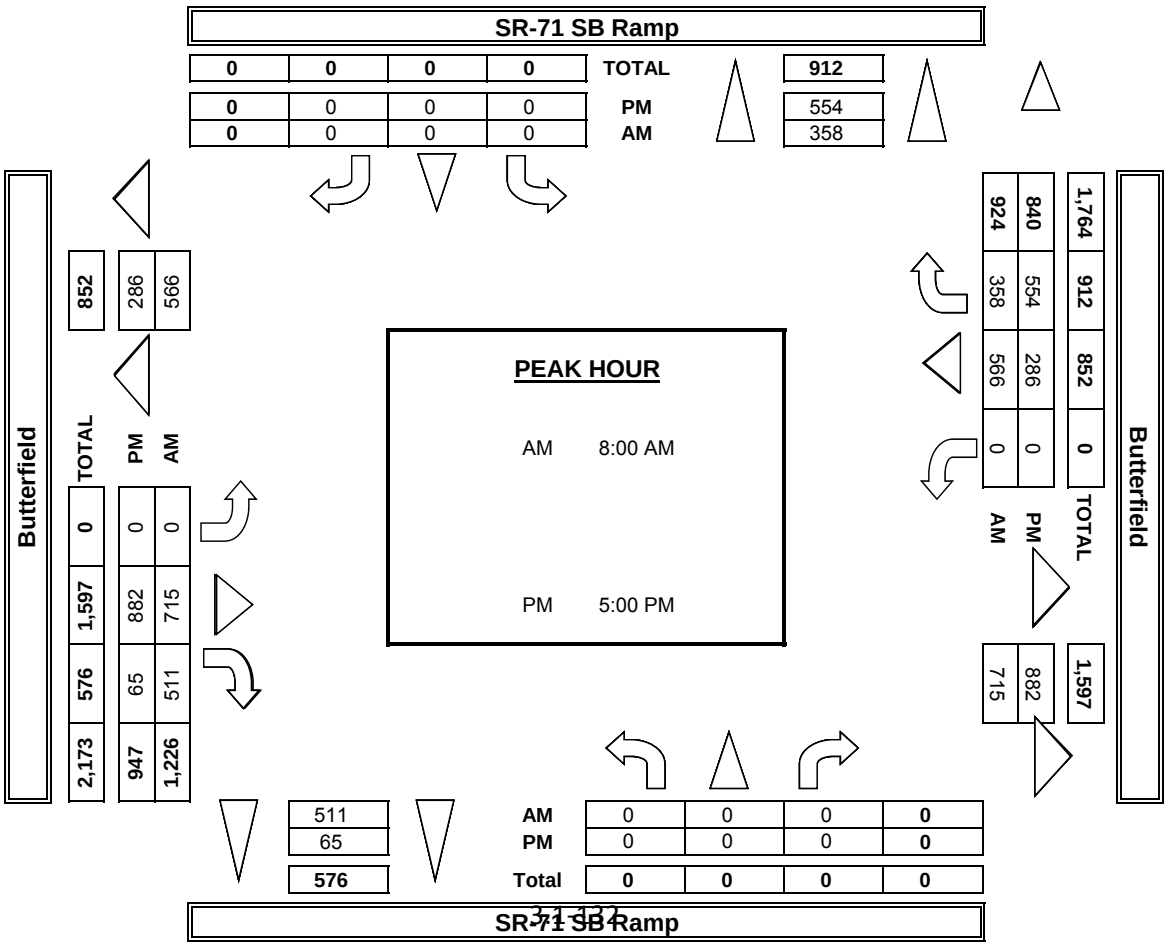


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	2	0	2	0	0	0	0	0	0	0	2	0	2
	8:15 AM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	2	2	0	4	0	0	0	0	0	0	2	2	0	4
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	5:45 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	TOTAL	0	0	0	4	4	0	0	0	0	0	0	0	0	4	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	SR-71 SB Ramp	LOCATION #:	14
TUESDAY	EAST & WEST:	Butterfield	CONTROL:	STOP ALL

CLASS 2:	NOTES:	AM / PM / MD / OTHER / OTHER
2-AXLE WORK VEHICLES/ TRUCKS		▲ N ◄ W E ► S ▼

		NORTHBOUND SR-71 SB Ramp			SOUTHBOUND SR-71 SB Ramp			EASTBOUND Butterfield			WESTBOUND Butterfield			
	LANES:	NL X	NT X	NR X	SL X	ST X	SR X	EL X	ET 2	ER 2	WL X	WT 2	WR 2	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	3	3	0	5	4	15
	7:15 AM	0	0	0	0	0	0	0	3	1	0	4	5	13
	7:30 AM	0	0	0	0	0	0	0	9	0	0	5	9	23
	7:45 AM	0	0	0	0	0	0	0	4	3	0	4	7	18
	8:00 AM	0	0	0	0	0	0	0	3	0	0	5	4	12
	8:15 AM	0	0	0	0	0	0	0	4	0	0	4	5	13
	8:30 AM	0	0	0	0	0	0	0	2	1	0	6	10	19
	8:45 AM	0	0	0	0	0	0	0	6	2	0	4	5	17
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	34	10	0	37	49	130
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	77%	23%	0%	43%	57%	
	APP/DEPART	0	/	49	0	/	10	44	/	34	86	/	37	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	0	0	0	0	0	0	19	7	0	18	25	69
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	73%	27%	0%	42%	58%	
	PEAK HR FACTOR		0.000			0.000			0.722			0.768		0.750
	APP/DEPART	0	/	25	0	/	7	26	/	19	43	/	18	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	1	1	0	1	2	5
	4:15 PM	0	0	0	0	0	0	0	6	0	0	2	3	11
	4:30 PM	0	0	0	0	0	0	0	3	0	0	0	2	5
	4:45 PM	0	0	0	0	0	0	0	5	0	0	1	3	9
	5:00 PM	0	0	0	0	0	0	0	3	1	0	2	4	10
	5:15 PM	0	0	0	0	0	0	0	6	2	0	1	3	12
	5:30 PM	0	0	0	0	0	0	0	3	2	0	2	0	7
	5:45 PM	0	0	0	0	0	0	0	1	0	0	1	3	5
	VOLUMES	0	0	0	0	0	0	0	28	6	0	10	20	64
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	82%	18%	0%	33%	67%	
	APP/DEPART	0	/	20	0	/	6	34	/	28	30	/	10	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	0	0	0	0	0	0	0	17	5	0	6	10	38
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	77%	23%	0%	38%	63%	
	PEAK HR FACTOR		0.000			0.000			0.688			0.667		0.792
	APP/DEPART	0	/	10	0	/	5	22	/	17	16	/	6	0

U-TURNS					
NB	SB	EB	WB	TTL	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	SR-71 SB Ramp	LOCATION #:	14
TUESDAY	EAST & WEST:	Butterfield	CONTROL:	STOP ALL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND SR-71 SB Ramp			SOUTHBOUND SR-71 SB Ramp			EASTBOUND Butterfield			WESTBOUND Butterfield			
	LANES:	NL X	NT X	NR X	SL X	ST X	SR X	EL X	ET 2	ER 2	WL X	WT 2	WR 2	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	1	1	0	1	1	4
	7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
	7:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	2
	7:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	2
	8:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
	8:15 AM	0	0	0	0	0	0	0	1	0	0	0	1	2
	8:30 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
	8:45 AM	0	0	0	0	0	0	0	1	0	0	1	2	4
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	7	1	0	6	6	20
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	88%	13%	0%	50%	50%	
	APP/DEPART	0	/	6	0	/	1	8	/	7	12	/	6	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	0	0	0	0	0	0	4	0	0	4	3	11
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	57%	43%	
	PEAK HR FACTOR		0.000			0.000			0.500			0.583		0.688
	APP/DEPART	0	/	3	0	/	0	4	/	4	7	/	4	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	1	0	0	1	2	4
	4:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	2
	4:30 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
	4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	2
	5:00 PM	0	0	0	0	0	0	0	2	0	0	0	1	3
	5:15 PM	0	0	0	0	0	0	0	2	0	0	1	1	4
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	9	0	0	3	7	19
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	30%	70%	
	APP/DEPART	0	/	7	0	/	0	9	/	9	10	/	3	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	0	0	0	0	0	0	0	7	0	0	2	3	12
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	40%	60%	
	PEAK HR FACTOR		0.000			0.000			0.875			0.625		0.750
	APP/DEPART	0	/	3	0	/	0	7	/	7	5	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	SR-71 SB Ramp	LOCATION #:	14
TUESDAY	EAST & WEST:	Butterfield	CONTROL:	STOP ALL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

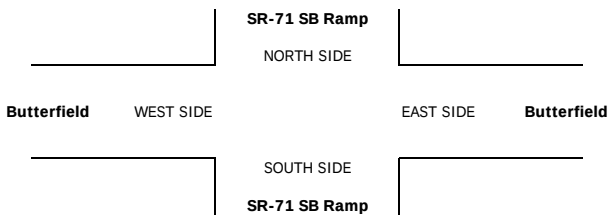
	NORTHBOUND SR-71 SB Ramp			SOUTHBOUND SR-71 SB Ramp			EASTBOUND Butterfield			WESTBOUND Butterfield			
LANES:	NL X	NT X	NR X	SL X	ST X	SR X	EL X	ET 2	ER 2	WL X	WT 2	WR 2	TOTAL
7:00 AM	0	0	0	0	0	0	0	2	0	0	0	2	4
7:15 AM	0	0	0	0	0	0	0	4	0	0	0	3	7
7:30 AM	0	0	0	0	0	0	0	5	0	0	0	4	9
7:45 AM	0	0	0	0	0	0	0	4	0	0	0	5	9
8:00 AM	0	0	0	0	0	0	0	6	0	0	0	6	12
8:15 AM	0	0	0	0	0	0	0	5	0	0	0	4	9
8:30 AM	0	0	0	0	0	0	0	3	0	0	1	5	9
8:45 AM	0	0	0	0	0	0	0	4	0	0	0	2	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	33	0	0	1	31	65
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	3%	97%	
APP/DEPART	0	/	31	0	/	0	33	/	33	32	/	1	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	0	0	0	0	0	0	0	18	0	0	1	20	39
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	5%	95%	
PEAK HR FACTOR		0.000			0.000			0.750			0.875		0.813
APP/DEPART	0	/	20	0	/	0	18	/	18	21	/	1	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	2	0	0	0	3	5
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	2	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	4	4
5:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	3	0	0	0	4	7
5:45 PM	0	0	0	0	0	0	0	2	0	0	0	2	4
VOLUMES	0	0	0	0	0	0	0	12	0	0	0	16	28
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%	
APP/DEPART	0	/	16	0	/	0	12	/	12	16	/	0	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	0	0	0	0	0	0	0	7	0	0	0	10	17
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%	
PEAK HR FACTOR		0.000			0.000			0.583			0.625		0.607
APP/DEPART	0	/	10	0	/	0	7	/	7	10	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Rincon Meadows
EAST & WEST: Kimball

PROJECT #: SC0916
LOCATION #: 16
CONTROL: STOP N

NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

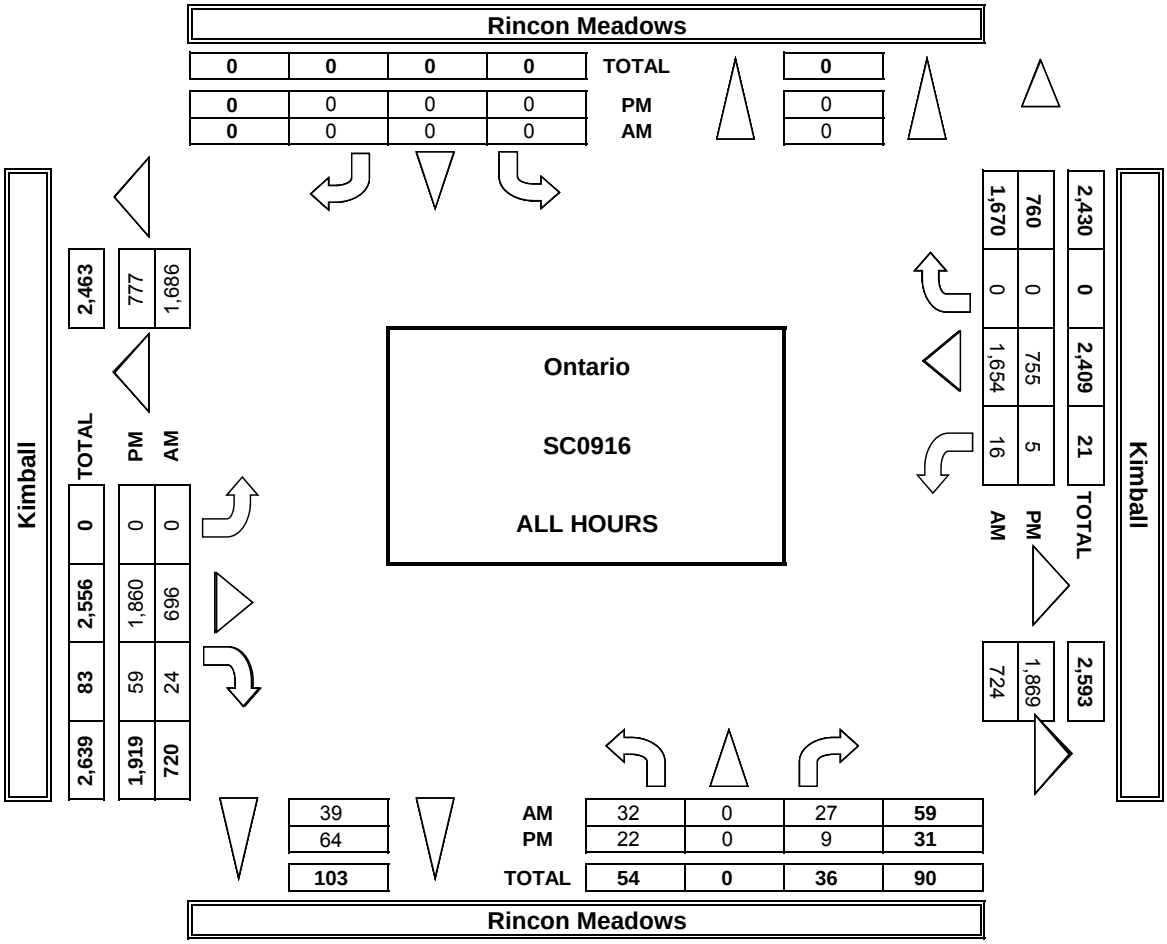
Add U-Turns to Left Turns

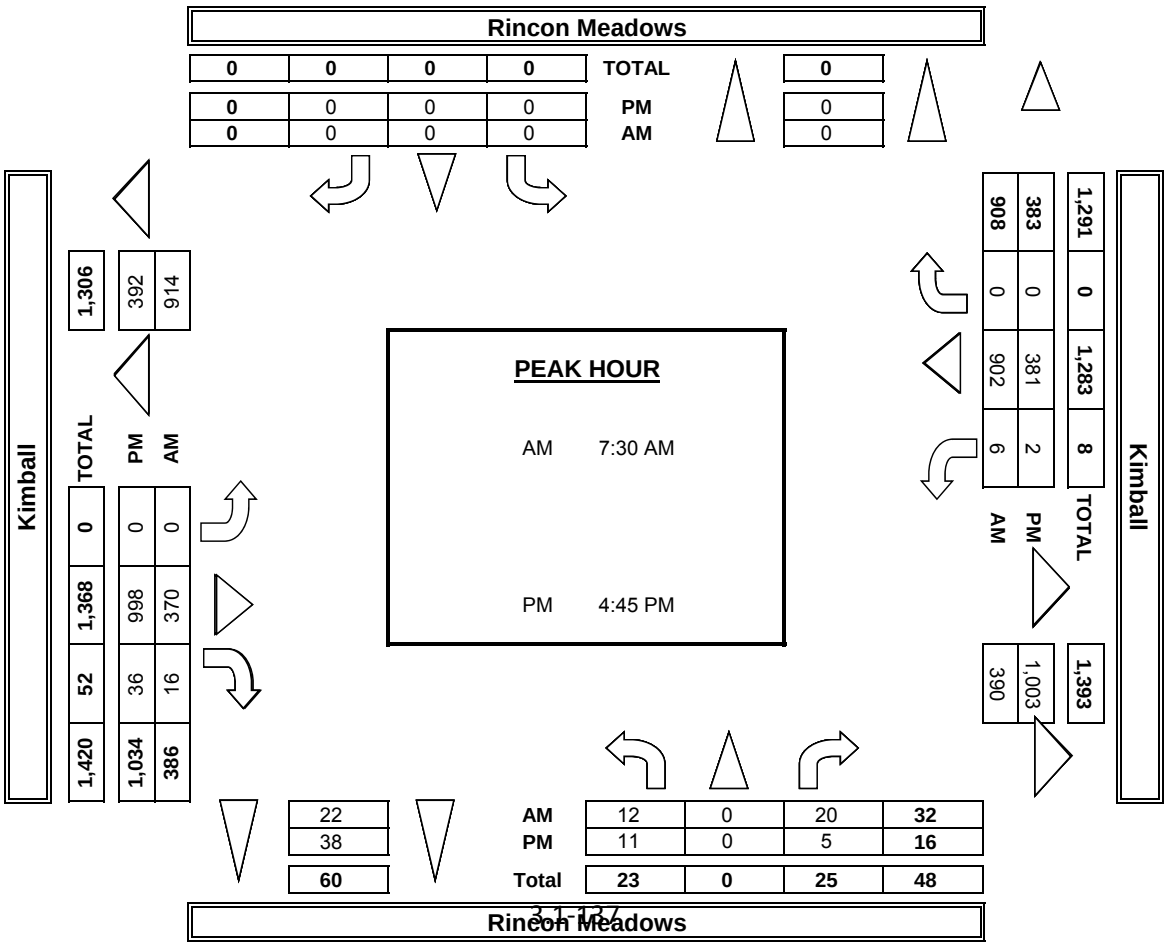
		NORTHBOUND (Rincon Meadows)			SOUTHBOUND (Rincon Meadows)			EASTBOUND (Kimball)			WESTBOUND (Kimball)				U-TURNS					RTOR			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 1	WT 1	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	5	0	3	0	0	0	0	98	2	3	248	0	359	0	0	0	0	0	0	0	0	0
	7:15 AM	3	0	2	0	0	0	0	70	1	1	198	0	275	0	0	0	0	0	0	0	0	0
	7:30 AM	4	0	1	0	0	0	0	77	4	0	249	0	335	0	0	0	0	0	0	0	0	0
	7:45 AM	4	0	3	0	0	0	0	97	3	2	238	0	347	0	0	0	0	0	0	0	0	0
	8:00 AM	2	0	3	0	0	0	0	81	5	1	212	0	304	0	0	0	0	0	0	0	0	0
	8:15 AM	2	0	13	0	0	0	0	115	4	3	203	0	340	0	0	0	0	0	0	0	0	0
	8:30 AM	4	0	2	0	0	0	0	79	4	6	162	0	257	0	0	0	1	1	0	0	0	0
	8:45 AM	8	0	0	0	0	0	0	79	1	0	144	0	232	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	32	0	27	0	0	0	0	696	24	16	1,654	0	2,449	0	0	0	1	1	0	0	0	0
	APPROACH %	54%	0%	46%	0%	0%	0%	0%	97%	3%	1%	99%	0%										
	APP/DEPART	59	/	0	0	/	39	720	/	724	1,670	/	1,686	0									
	BEGIN PEAK HR		7:30 AM																				
	VOLUMES	12	0	20	0	0	0	0	370	16	6	902	0	1,326						0	0	0	0
	APPROACH %	38%	0%	63%	0%	0%	0%	0%	96%	4%	1%	99%	0%										
	PEAK HR FACTOR		0.533			0.000			0.811			0.912		0.955									
	APP/DEPART	32	/	0	0	/	22	386	/	390	908	/	914	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	4	0	0	0	0	0	0	182	6	2	78	0	272	0	0	0	0	0	0	0	0	0
	4:15 PM	2	0	1	0	0	0	0	205	6	0	107	0	321	0	0	0	0	0	0	0	0	0
	4:30 PM	2	0	0	0	0	0	0	215	5	0	104	0	326	0	0	0	0	0	0	0	0	0
	4:45 PM	5	0	1	0	0	0	0	242	10	1	104	0	363	0	0	0	0	0	0	0	0	0
	5:00 PM	1	0	1	0	0	0	0	240	8	1	91	0	342	0	0	0	0	0	0	0	0	0
	5:15 PM	3	0	2	0	0	0	0	256	2	0	79	0	342	0	0	0	0	0	0	0	0	0
	5:30 PM	2	0	1	0	0	0	0	260	16	0	107	0	386	0	0	0	0	0	0	0	0	0
	5:45 PM	3	0	3	0	0	0	0	260	6	1	85	0	358	0	0	0	0	0	0	0	0	0
	VOLUMES	22	0	9	0	0	0	0	1,860	59	5	755	0	2,710	0	0	0	0	0	0	0	0	0
	APPROACH %	71%	0%	29%	0%	0%	0%	0%	97%	3%	1%	99%	0%										
	APP/DEPART	31	/	0	0	/	64	1,919	/	1,869	760	/	777	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	11	0	5	0	0	0	0	998	36	2	381	0	1,433						0	0	0	0
	APPROACH %	69%	0%	31%	0%	0%	0%	0%	97%	3%	1%	99%	0%										
	PEAK HR FACTOR		0.667			0.000			0.937			0.895		0.928									
	APP/DEPART	16	/	0	0	/	38	1,034	/	1,003	383	/	392	0									

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	8:15 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	1	2	0	3	0	1	0	0	1	0	0	2	0	2
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Rincon Meadows	LOCATION #:	16
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Rincon Meadows			SOUTHBOUND Rincon Meadows			EASTBOUND Kimball			WESTBOUND Kimball			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 1	WT 1	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	3	0	1	8	0	12
	7:15 AM	1	0	0	0	0	0	0	4	0	0	12	0	17
	7:30 AM	0	0	0	0	0	0	0	0	2	0	6	0	8
	7:45 AM	0	0	0	0	0	0	0	2	1	0	7	0	10
	8:00 AM	0	0	1	0	0	0	0	3	1	0	2	0	7
	8:15 AM	0	0	0	0	0	0	0	4	0	1	1	0	6
	8:30 AM	0	0	0	0	0	0	0	0	0	0	5	0	5
	8:45 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1	0	1	0	0	0	0	17	4	2	42	0	67
	APPROACH %	50%	0%	50%	0%	0%	0%	0%	81%	19%	5%	95%	0%	
	APP/DEPART	2	/	0	0	/	6	21	/	18	44	/	43	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	1	0	0	0	0	0	0	9	3	1	33	0	47
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	75%	25%	3%	97%	0%	
	PEAK HR FACTOR		0.250			0.000			0.750			0.708		0.691
	APP/DEPART	1	/	0	0	/	4	12	/	9	34	/	34	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	6	0	0	1	0	7
	4:15 PM	0	0	0	0	0	0	0	5	0	0	0	0	5
	4:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
	4:45 PM	1	0	0	0	0	0	0	2	1	0	1	0	5
	5:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
	5:15 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
	5:30 PM	0	0	0	0	0	0	0	6	0	0	2	0	8
	5:45 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
	VOLUMES	1	0	0	0	0	0	0	27	1	0	6	0	35
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	96%	4%	0%	100%	0%	
	APP/DEPART	1	/	0	0	/	1	28	/	27	6	/	7	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	1	0	0	0	0	0	0	15	1	0	2	0	19
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	94%	6%	0%	100%	0%	
	PEAK HR FACTOR		0.250			0.000			0.667			0.500		0.679
	APP/DEPART	1	/	0	0	/	1	16	/	15	2	/	3	0

U-TURNS					
NB	SB	EB	WB	TTL	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Rincon Meadows	LOCATION #:	16
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND Rincon Meadows			SOUTHBOUND Rincon Meadows			EASTBOUND Kimball			WESTBOUND Kimball			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 1	WT 1	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	1	0	1	1	0	3
	7:15 AM	0	0	0	0	0	0	0	3	0	0	0	0	3
	7:30 AM	2	0	0	0	0	0	0	2	0	0	2	0	6
	7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
	8:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	1	0	0	0	0	0	0	2	1	0	2	0	6
	8:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	3
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	3	0	0	0	0	0	0	8	1	1	12	0	25
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	89%	11%	8%	92%	0%	
	APP/DEPART	3	/	0	0	/	2	9	/	8	13	/	15	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	2	0	0	0	0	0	0	6	0	1	5	0	14
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	100%	0%	17%	83%	0%	
	PEAK HR FACTOR		0.250			0.000			0.500			0.750		0.583
	APP/DEPART	2	/	0	0	/	1	6	/	6	6	/	7	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
	4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
	5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	4	0	0	4	0	8
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	APP/DEPART	0	/	0	0	/	0	4	/	4	4	/	4	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	0	0	0	0	0	0	4	0	0	2	0	6
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.000			0.333			0.500		0.500
	APP/DEPART	0	/	0	0	/	0	4	/	4	2	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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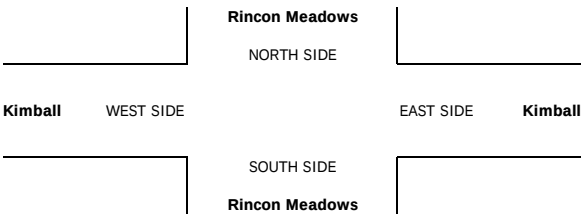
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Rincon Meadows	LOCATION #:	16
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Rincon Meadows			SOUTHBOUND Rincon Meadows			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 1	WT 1	WR X	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	1	0	2	0	4
7:45 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	3	0	0	3	0	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	7	1	0	8	0	16
APPROACH %	0%	0%	0%	0%	0%	0%	0%	88%	13%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	1	8	/	7	8	/	8	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	0	0	0	0	0	0	0	3	1	0	5	0	9
APPROACH %	0%	0%	0%	0%	0%	0%	0%	75%	25%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.500			0.625		0.563
APP/DEPART	0	/	0	0	/	1	4	/	3	5	/	5	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
5:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	1	1	0	0	0	2
VOLUMES	0	0	0	0	0	0	0	6	1	0	1	0	8
APPROACH %	0%	0%	0%	0%	0%	0%	0%	86%	14%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	1	7	/	6	1	/	1	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	0	0	0	0	0	0	0	4	1	0	1	0	6
APPROACH %	0%	0%	0%	0%	0%	0%	0%	80%	20%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.625			0.250		0.750
APP/DEPART	0	/	0	0	/	1	5	/	4	1	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
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0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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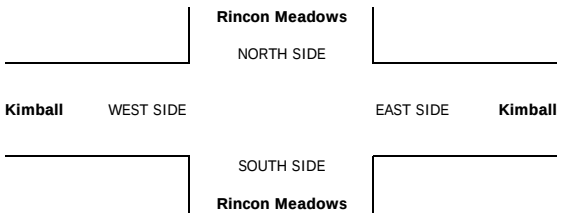
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Mill Creek
EAST & WEST: Kimball

PROJECT #: SC0916
LOCATION #: 17
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

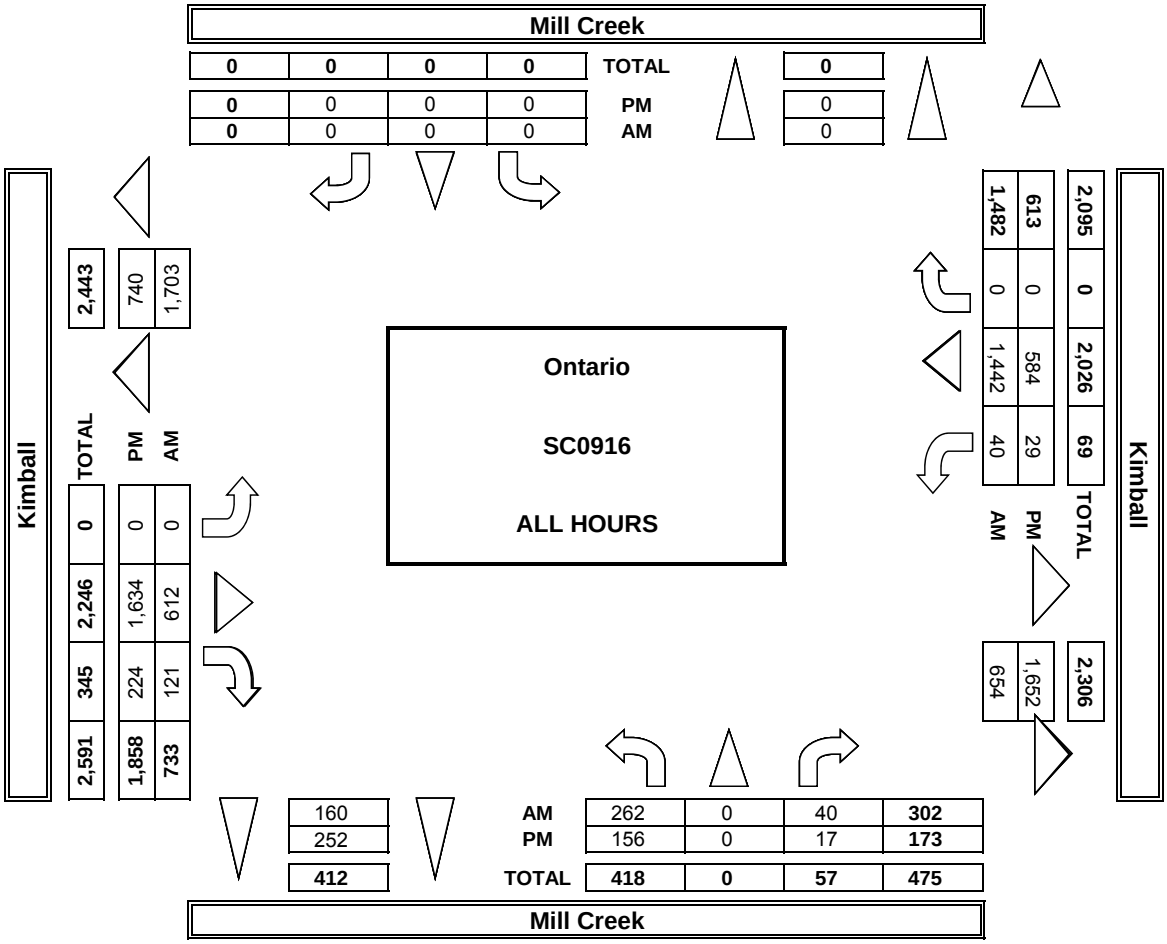
Add U-Turns to Left Turns

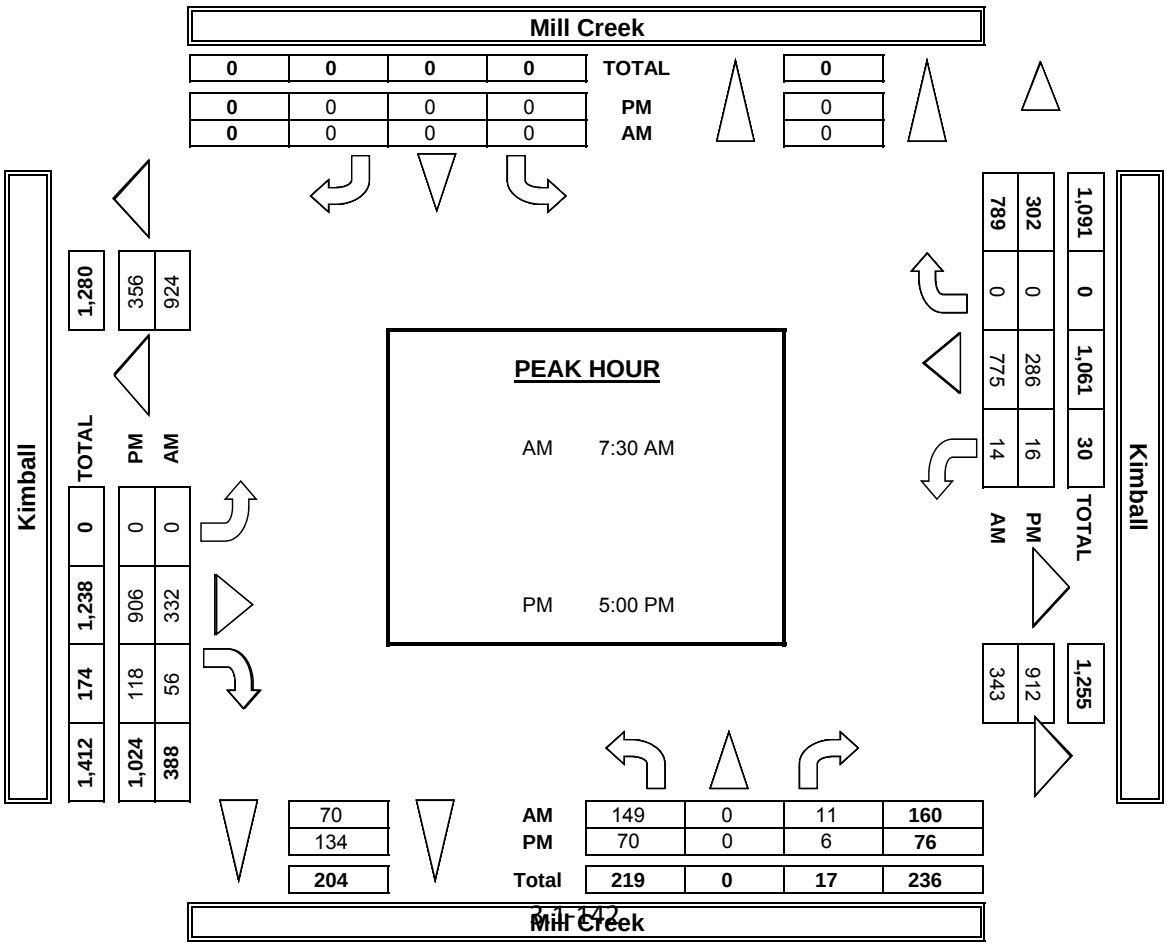
		NORTHBOUND (Mill Creek)			SOUTHBOUND (Mill Creek)			EASTBOUND (Kimball)			WESTBOUND (Kimball)				U-TURNS					RTOR			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	43	0	4	0	0	0	0	72	24	3	215	0	361	0	0	0	0	0	0	0	0	0
	7:15 AM	27	0	4	0	0	0	0	59	21	0	169	0	280	0	0	0	0	0	1	0	0	0
	7:30 AM	35	0	3	0	0	0	0	62	17	3	202	0	322	0	0	0	0	0	1	0	0	0
	7:45 AM	46	0	0	0	0	0	0	76	17	5	197	0	341	0	0	0	0	0	0	0	0	0
	8:00 AM	26	0	5	0	0	0	0	83	4	2	188	0	308	0	0	0	0	0	2	0	0	0
	8:15 AM	42	0	3	0	0	0	0	111	18	4	188	0	366	0	0	0	0	0	0	0	0	0
	8:30 AM	19	0	9	0	0	0	0	78	11	12	140	0	269	1	0	0	2	3	0	0	0	0
	8:45 AM	24	0	12	0	0	0	0	71	9	11	143	0	270	0	0	0	0	0	2	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	262	0	40	0	0	0	0	612	121	40	1,442	0	2,517	1	0	0	2	3	6	0	0	0
	APPROACH %	87%	0%	13%	0%	0%	0%	0%	83%	17%	3%	97%	0%										
	APP/DEPART	302	/	0	0	/	160	733	/	654	1,482	/	1,703	0									
	BEGIN PEAK HR		7:30 AM																				
	VOLUMES	149	0	11	0	0	0	0	332	56	14	775	0	1,337						3	0	0	0
	APPROACH %	93%	0%	7%	0%	0%	0%	0%	86%	14%	2%	98%	0%										
	PEAK HR FACTOR		0.870			0.000			0.752			0.962		0.913									
	APP/DEPART	160	/	0	0	/	70	388	/	343	789	/	924	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	11	0	2	0	0	0	0	172	25	4	68	0	282	0	0	0	0	0	1	0	0	0
	4:15 PM	26	0	2	0	0	0	0	162	26	6	74	0	296	0	0	0	1	1	0	0	0	0
	4:30 PM	26	0	3	0	0	0	0	176	21	2	75	0	303	0	0	0	0	0	0	0	0	0
	4:45 PM	23	0	4	0	0	0	0	218	34	1	81	0	361	0	0	0	0	0	1	0	0	0
	5:00 PM	18	0	3	0	0	0	0	209	32	2	70	0	334	0	0	0	0	0	2	0	0	0
	5:15 PM	10	0	1	0	0	0	0	217	31	3	72	0	334	0	0	0	0	0	0	0	0	0
	5:30 PM	23	0	0	0	0	0	0	237	26	5	78	0	369	0	0	0	0	0	0	0	0	0
	5:45 PM	19	0	2	0	0	0	0	243	29	6	66	0	365	0	0	0	0	0	0	0	0	0
	VOLUMES	156	0	17	0	0	0	0	1,634	224	29	584	0	2,644	0	0	0	1	1	4	0	0	0
	APPROACH %	90%	0%	10%	0%	0%	0%	0%	88%	12%	5%	95%	0%										
	APP/DEPART	173	/	0	0	/	252	1,858	/	1,652	613	/	740	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	70	0	6	0	0	0	0	906	118	16	286	0	1,402						2	0	0	0
	APPROACH %	92%	0%	8%	0%	0%	0%	0%	88%	12%	5%	95%	0%										
	PEAK HR FACTOR		0.826			0.000			0.941			0.910		0.950									
	APP/DEPART	76	/	0	0	/	134	1,024	/	912	302	/	356	0									

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	8:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:30 AM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	8:45 AM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	8	1	9	0	0	7	1	8	0	0	1	0	1
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	4	0	4	0	0	1	0	1	0	0	3	0	3
	4:15 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	3	0	3	0	0	0	0	0	0	0	3	0	3
	5:30 PM	0	0	5	0	5	0	0	3	0	3	0	0	2	0	2
	5:45 PM	0	0	2	0	2	0	0	0	0	0	0	0	2	0	2
	TOTAL	0	0	16	0	16	0	0	5	0	5	0	0	11	0	11

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Mill Creek	LOCATION #:	17
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Mill Creek			SOUTHBOUND Mill Creek			EASTBOUND Kimball			WESTBOUND Kimball			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	1	1	1	8	0	11
	7:15 AM	0	0	0	0	0	0	0	2	0	0	4	0	6
	7:30 AM	0	0	0	0	0	0	0	3	0	0	7	0	10
	7:45 AM	0	0	0	0	0	0	0	2	1	2	4	0	9
	8:00 AM	0	0	0	0	0	0	0	3	1	0	3	0	7
	8:15 AM	1	0	0	0	0	0	0	2	0	0	2	0	5
	8:30 AM	0	0	1	0	0	0	0	0	0	1	1	0	3
	8:45 AM	0	0	1	0	0	0	0	1	0	1	2	0	5
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1	0	2	0	0	0	0	14	3	5	31	0	56
	APPROACH %	33%	0%	67%	0%	0%	0%	0%	82%	18%	14%	86%	0%	
	APP/DEPART	3	/	0	0	/	8	17	/	16	36	/	32	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	0	0	0	0	0	0	8	2	3	23	0	36
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	80%	20%	12%	88%	0%	
	PEAK HR FACTOR		0.000			0.000			0.833			0.722		0.818
	APP/DEPART	0	/	0	0	/	5	10	/	8	26	/	23	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	6	0	0	1	0	7
	4:15 PM	0	0	0	0	0	0	0	8	0	1	3	0	12
	4:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
	4:45 PM	1	0	0	0	0	0	0	3	0	0	0	0	4
	5:00 PM	0	0	0	0	0	0	0	3	2	0	0	0	5
	5:15 PM	0	0	0	0	0	0	0	5	1	0	0	0	6
	5:30 PM	0	0	0	0	0	0	0	3	1	0	1	0	5
	5:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
	VOLUMES	2	0	0	0	0	0	0	31	4	1	5	0	43
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	89%	11%	17%	83%	0%	
	APP/DEPART	2	/	0	0	/	5	35	/	31	6	/	7	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	1	0	0	0	0	0	0	20	0	1	4	0	26
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	100%	0%	20%	80%	0%	
	PEAK HR FACTOR		0.250			0.000			0.625			0.313		0.542
	APP/DEPART	1	/	0	0	/	1	20	/	20	5	/	5	0

U-TURNS					
NB	SB	EB	WB	TTL	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0	

RTOR			
NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Mill Creek

NORTH SIDE

Kimball WEST SIDE EAST SIDE **Kimball**

SOUTH SIDE

Mill Creek

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Mill Creek	LOCATION #:	17
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND Mill Creek			SOUTHBOUND Mill Creek			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
7:00 AM	1	0	0	0	0	0	0	0	1	0	1	0	3
7:15 AM	0	0	2	0	0	0	0	1	0	0	0	0	3
7:30 AM	1	0	0	0	0	0	0	2	1	0	1	0	5
7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:15 AM	0	0	0	0	0	0	0	1	0	1	0	0	2
8:30 AM	0	0	1	0	0	0	0	2	0	0	3	0	6
8:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	4
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	2	0	3	0	0	0	0	6	2	1	12	0	26
APPROACH %	40%	0%	60%	0%	0%	0%	0%	75%	25%	8%	92%	0%	
APP/DEPART	5	/	0	0	/	3	8	/	9	13	/	14	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	1	0	0	0	0	3	0	1	8	0	13
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	11%	89%	0%	
PEAK HR FACTOR		0.125			0.000			0.250			0.563		0.542
APP/DEPART	1	/	0	0	/	1	3	/	4	9	/	8	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
4:15 PM	0	0	1	0	0	0	0	0	0	1	2	0	4
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	0	0	0	2	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	2	0	0	0	0	4	0	1	5	0	12
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	17%	83%	0%	
APP/DEPART	2	/	0	0	/	1	4	/	6	6	/	5	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	0	2	0	0	0	0	4	0	1	3	0	10
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	25%	75%	0%	
PEAK HR FACTOR		0.500			0.000			0.500			0.333		0.625
APP/DEPART	2	/	0	0	/	1	4	/	6	4	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Mill Creek	LOCATION #:	17
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

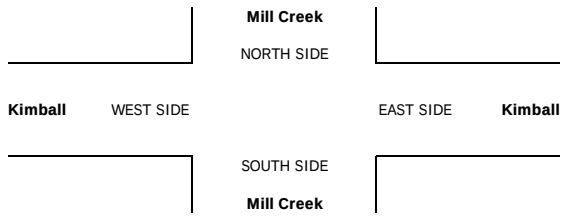
		NORTHBOUND Mill Creek			SOUTHBOUND Mill Creek			EASTBOUND Kimball			WESTBOUND Kimball			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
	7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
	7:30 AM	0	0	0	0	0	0	0	0	1	1	1	0	3
	7:45 AM	2	0	0	0	0	0	0	2	0	0	0	0	4
	8:00 AM	0	0	1	0	0	0	0	0	0	0	2	0	3
	8:15 AM	0	0	0	0	0	0	0	0	0	1	2	0	3
	8:30 AM	0	0	1	0	0	0	0	1	0	1	0	0	3
	8:45 AM	0	0	1	0	0	0	0	3	0	0	0	0	4
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	2	0	3	0	0	0	0	7	1	3	6	0	22
	APPROACH %	40%	0%	60%	0%	0%	0%	0%	88%	13%	33%	67%	0%	
	APP/DEPART	5	/	0	0	/	4	8	/	10	9	/	8	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	0	0	3	0	0	0	0	4	0	2	4	0	13
	APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	33%	67%	0%	
	PEAK HR FACTOR		0.375			0.000			0.333			0.500		0.813
	APP/DEPART	3	/	0	0	/	2	4	/	7	6	/	4	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	1	0	0	0	0	0	0	1	0	0	2
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
	5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
	5:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
	VOLUMES	0	0	1	0	0	0	0	8	0	1	1	0	11
	APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	50%	50%	0%	
	APP/DEPART	1	/	0	0	/	1	8	/	9	2	/	1	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	0	0	0	0	0	0	0	6	0	0	1	0	7
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.000			0.500			0.250		0.583
	APP/DEPART	0	/	0	0	/	0	6	/	6	1	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Main
EAST & WEST: Kimball

PROJECT #: SC0916
LOCATION #: 19
CONTROL: SIGNAL

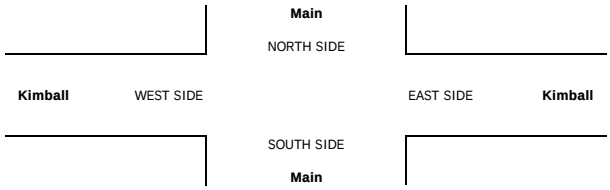
NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ▼ S
◄ W E ►

Add U-Turns to Left Turns

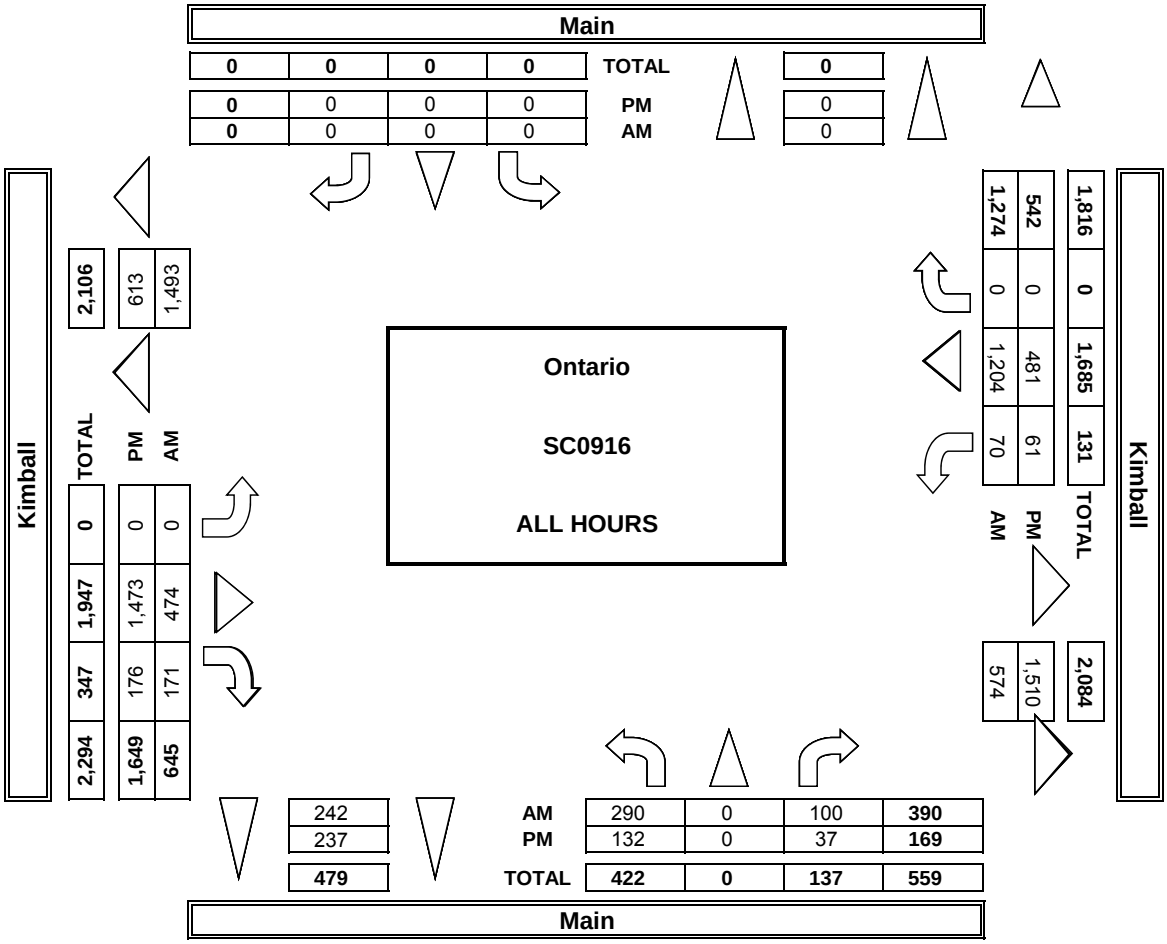
		NORTHBOUND Main			SOUTHBOUND Main			EASTBOUND Kimball			WESTBOUND Kimball				U-TURNS					RTOR			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	25	0	7	0	0	0	0	62	9	5	185	0	293	0	0	0	0	0	0	0	0	0
	7:15 AM	18	0	10	0	0	0	0	55	8	3	161	0	255	0	0	0	0	0	0	0	0	0
	7:30 AM	29	0	13	0	0	0	0	45	16	6	183	0	292	0	0	0	0	0	0	0	0	0
	7:45 AM	32	0	4	0	0	0	0	58	16	6	161	0	277	1	0	0	0	1	1	0	0	0
	8:00 AM	39	0	10	0	0	0	0	57	28	11	153	0	298	0	0	0	0	0	3	0	0	0
	8:15 AM	53	0	14	0	0	0	0	65	48	14	131	0	325	0	0	0	0	0	2	0	0	0
	8:30 AM	78	0	34	0	0	0	0	66	30	19	125	0	352	0	0	0	0	0	10	0	0	0
	8:45 AM	16	0	8	0	0	0	0	66	16	6	105	0	217	0	0	0	0	0	1	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	290	0	100	0	0	0	0	474	171	70	1,204	0	2,309	1	0	0	0	1	17	0	0	0
	APPROACH %	74%	0%	26%	0%	0%	0%	0%	73%	27%	5%	95%	0%										
	APP/DEPART	390	/	0	0	/	242	645	/	574	1,274	/	1,493	0									
	BEGIN PEAK HR		7:45 AM																				
	VOLUMES	202	0	62	0	0	0	0	246	122	50	570	0	1,252						16	0	0	0
	APPROACH %	77%	0%	23%	0%	0%	0%	0%	67%	33%	8%	92%	0%										
	PEAK HR FACTOR		0.589			0.000			0.814			0.928		0.889									
	APP/DEPART	264	/	0	0	/	173	368	/	308	620	/	771	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	18	0	1	0	0	0	0	153	15	7	60	0	254	0	0	0	0	0	1	0	0	0
	4:15 PM	19	0	7	0	0	0	0	159	19	11	57	0	272	0	0	0	0	0	3	0	0	0
	4:30 PM	21	0	3	0	0	0	0	161	20	7	60	0	272	0	0	0	0	0	1	0	0	0
	4:45 PM	14	0	7	0	0	0	0	190	17	3	62	0	293	0	0	0	0	0	2	0	0	0
	5:00 PM	15	0	3	0	0	0	0	190	20	7	60	0	295	0	0	0	0	0	0	0	0	0
	5:15 PM	14	0	5	0	0	0	0	196	31	8	57	0	311	0	0	0	0	0	2	0	0	0
	5:30 PM	18	0	7	0	0	0	0	218	24	8	66	0	341	0	0	0	0	0	3	0	0	0
	5:45 PM	13	0	4	0	0	0	0	206	30	10	59	0	322	0	0	0	0	0	1	0	0	0
	VOLUMES	132	0	37	0	0	0	0	1,473	176	61	481	0	2,360	0	0	0	0	0	13	0	0	0
	APPROACH %	78%	0%	22%	0%	0%	0%	0%	89%	11%	11%	89%	0%										
	APP/DEPART	169	/	0	0	/	237	1,649	/	1,510	542	/	613	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	60	0	19	0	0	0	0	810	105	33	242	0	1,269						6	0	0	0
	APPROACH %	76%	0%	24%	0%	0%	0%	0%	89%	11%	12%	88%	0%										
	PEAK HR FACTOR		0.790			0.000			0.945			0.929		0.930									
	APP/DEPART	79	/	0	0	/	138	915	/	829	275	/	302	0									

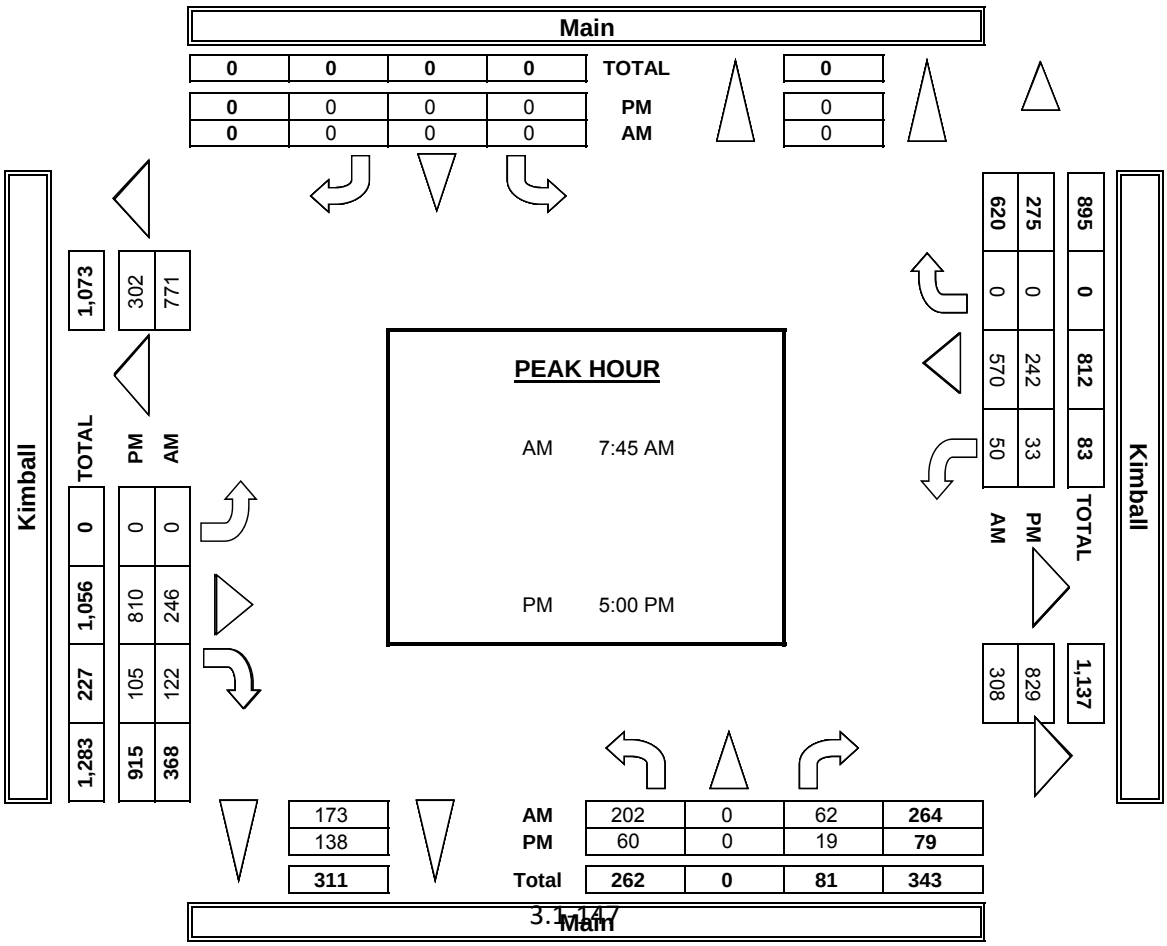


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	7:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	8:00 AM	0	0	3	0	3	0	0	2	0	2	0	0	1	0	1
	8:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:30 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	9	0	9	0	0	7	0	7	0	0	2	0	2
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	4	0	4	0	0	1	0	1	0	0	3	0	3
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:45 PM	0	0	2	0	2	0	0	1	0	1	0	0	1	0	1
	TOTAL	0	0	11	0	11	0	0	4	0	4	0	0	7	0	7

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Main	LOCATION #:	19
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND Main			SOUTHBOUND Main			EASTBOUND Kimball			WESTBOUND Kimball			
	LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	1	0	0	4	0	5
	7:15 AM	0	0	0	0	0	0	0	1	1	0	3	0	5
	7:30 AM	1	0	0	0	0	0	0	2	0	1	3	0	7
	7:45 AM	2	0	0	0	0	0	0	1	0	1	1	0	5
	8:00 AM	0	0	0	0	0	0	0	3	1	0	1	0	5
	8:15 AM	0	0	0	0	0	0	0	2	0	0	3	0	5
	8:30 AM	0	0	1	0	0	0	0	1	0	0	5	0	7
	8:45 AM	0	0	0	0	0	0	0	3	1	0	2	0	6
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	3	0	1	0	0	0	0	14	3	2	22	0	45
	APPROACH %	75%	0%	25%	0%	0%	0%	0%	82%	18%	8%	92%	0%	
	APP/DEPART	4	/	0	0	/	5	17	/	15	24	/	25	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	0	1	0	0	0	0	9	2	0	11	0	23
	APPROACH %	0%	0%	100%	0%	0%	0%	0%	82%	18%	0%	100%	0%	
	PEAK HR FACTOR		0.250			0.000			0.688			0.550		0.821
	APP/DEPART	1	/	0	0	/	2	11	/	10	11	/	11	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	0	0	0	0	0	0	4	0	0	1	0	6
	4:15 PM	0	0	0	0	0	0	0	4	0	0	0	0	4
	4:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
	4:45 PM	0	0	0	0	0	0	0	3	1	0	1	0	5
	5:00 PM	0	0	0	0	0	0	0	3	0	0	1	0	4
	5:15 PM	0	0	0	0	0	0	0	7	0	0	1	0	8
	5:30 PM	1	0	0	0	0	0	0	2	0	0	2	0	5
	5:45 PM	0	0	0	0	0	0	0	3	0	0	2	0	5
	VOLUMES	2	0	0	0	0	0	0	28	1	0	8	0	39
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	97%	3%	0%	100%	0%	
	APP/DEPART	2	/	0	0	/	1	29	/	28	8	/	10	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	1	0	0	0	0	0	0	15	0	0	6	0	22
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.250			0.000			0.536			0.750		0.688
	APP/DEPART	1	/	0	0	/	0	15	/	15	6	/	7	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Main	LOCATION #:	19
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

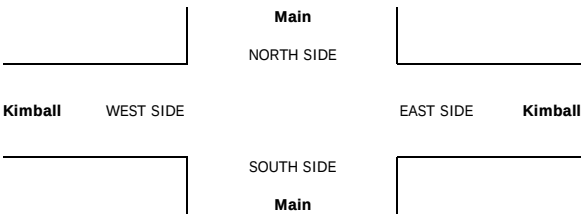
	NORTHBOUND Main			SOUTHBOUND Main			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
AM													
7:00 AM	0	0	0	0	0	0	0	3	0	0	1	0	4
7:15 AM	0	0	0	0	0	0	0	3	0	0	0	0	3
7:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:00 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
8:15 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
8:30 AM	0	0	0	0	0	0	0	2	0	1	2	0	5
8:45 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	12	0	1	11	0	24
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	8%	92%	0%	
APP/DEPART	0	/	0	0	/	1	12	/	12	12	/	11	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	0	0	0	0	0	5	0	1	6	0	12
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	14%	86%	0%	
PEAK HR FACTOR		0.000			0.000			0.417			0.583		0.600
APP/DEPART	0	/	0	0	/	1	5	/	5	7	/	6	0
PM													
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	3	0	0	1	0	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	0	0	0	3	1	0	0	0	5
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
VOLUMES	0	0	1	0	0	0	0	7	1	0	5	0	14
APPROACH %	0%	0%	100%	0%	0%	0%	0%	88%	13%	0%	100%	0%	
APP/DEPART	1	/	0	0	/	1	8	/	8	5	/	5	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	0	1	0	0	0	0	6	1	0	3	0	11
APPROACH %	0%	0%	100%	0%	0%	0%	0%	86%	14%	0%	100%	0%	
PEAK HR FACTOR		0.250			0.000			0.438			0.375		0.550
APP/DEPART	1	/	0	0	/	1	7	/	7	3	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Main	LOCATION #:	19
TUESDAY	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Main			SOUTHBOUND Main			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT X	NR 1	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
7:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:15 AM	0	0	1	0	0	0	0	0	0	1	3	0	5
8:30 AM	0	0	0	0	0	0	0	3	0	0	2	0	5
8:45 AM	0	0	0	0	0	0	0	4	0	0	2	0	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	1	0	0	0	0	11	0	1	10	0	23
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	9%	91%	0%	
APP/DEPART	1	/	0	0	/	1	11	/	12	11	/	10	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	0	1	0	0	0	0	8	0	1	7	0	17
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	13%	88%	0%	
PEAK HR FACTOR		0.250			0.000			0.500			0.500		0.708
APP/DEPART	1	/	0	0	/	1	8	/	9	8	/	7	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:30 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
5:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
VOLUMES	0	0	0	0	0	0	0	9	0	0	3	0	12
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	0	9	/	9	3	/	3	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	0	0	0	0	0	0	0	5	0	0	2	0	7
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.417			0.500		0.583
APP/DEPART	0	/	0	0	/	0	5	/	5	2	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

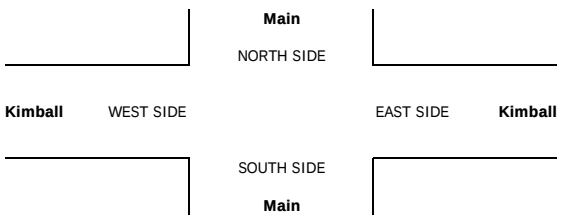
0	0	0	0

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Tue, Apr 26, 16	NORTH & SOUTH:	Flight	LOCATION #:	23
	EAST & WEST:	Kimball	CONTROL:	STOP N/S

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Flight)			SOUTHBOUND (Flight)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	6	4	11	10	2	4	15	49	0	0	181	23	305
	7:15 AM	3	6	2	4	4	6	13	51	3	2	165	27	286
	7:30 AM	2	7	1	6	3	8	13	41	1	1	184	27	294
	7:45 AM	1	1	2	4	3	9	5	50	2	2	163	30	272
	8:00 AM	4	1	4	10	1	7	11	48	2	0	156	19	263
	8:15 AM	4	6	3	5	2	12	8	56	4	5	130	16	251
	8:30 AM	4	6	7	8	2	11	18	67	6	1	130	11	271
	8:45 AM	2	3	6	13	0	4	18	52	3	3	105	13	222
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	26	34	36	60	17	61	101	414	21	14	1,214	166	2,164
	APPROACH %	27%	35%	38%	43%	12%	44%	19%	77%	4%	1%	87%	12%	
	APP/DEPART	96	/ 300		138	/ 52		536	/ 510		1,394	/ 1,302		0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	12	18	16	24	12	27	46	191	6	5	693	107	1,157
	APPROACH %	26%	39%	35%	38%	19%	43%	19%	79%	2%	1%	86%	13%	
	PEAK HR FACTOR		0.548			0.926			0.907			0.949		0.948
	APP/DEPART	46	/ 171		63	/ 23		243	/ 231		805	/ 732		0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	2	1	2	13	4	10	9	136	10	5	49	6	247
	4:15 PM	3	4	4	10	2	10	4	160	7	1	54	7	266
	4:30 PM	0	1	3	11	6	13	15	155	3	3	51	2	263
	4:45 PM	1	1	2	11	4	5	14	172	5	8	60	7	290
	5:00 PM	4	2	2	9	2	8	10	181	16	3	49	6	292
	5:15 PM	7	2	0	19	3	6	6	200	7	6	44	6	306
	5:30 PM	3	0	3	13	7	11	11	209	6	2	56	4	325
	5:45 PM	3	2	4	9	4	9	12	191	10	2	52	5	303
	VOLUMES	23	13	20	95	32	72	81	1,404	64	30	415	43	2,292
	APPROACH %	41%	23%	36%	48%	16%	36%	5%	91%	4%	6%	85%	9%	
	APP/DEPART	56	/ 136		199	/ 126		1,549	/ 1,519		488	/ 511		0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	17	6	9	50	16	34	39	781	39	13	201	21	1,226
	APPROACH %	53%	19%	28%	50%	16%	34%	5%	91%	5%	6%	86%	9%	
	PEAK HR FACTOR		0.889			0.806			0.950			0.948		0.943
	APP/DEPART	32	/ 66		100	/ 68		859	/ 840		235	/ 252		0

U-TURNS

NB	SB	EB	WB	TTL
X	X	X	X	
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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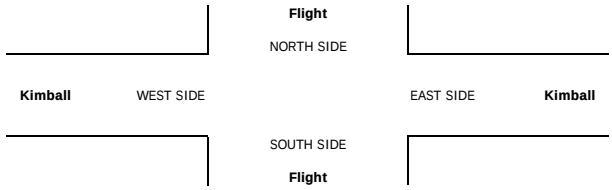
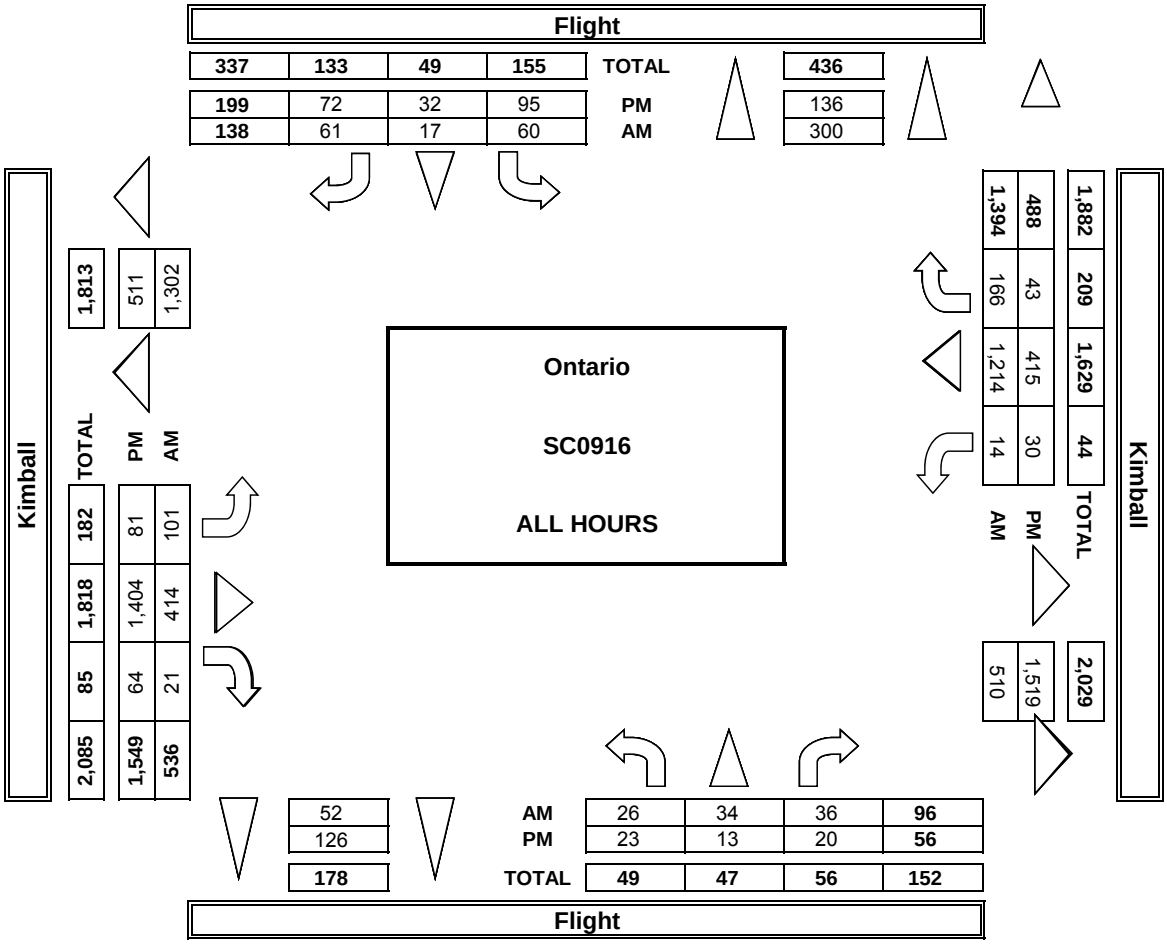
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

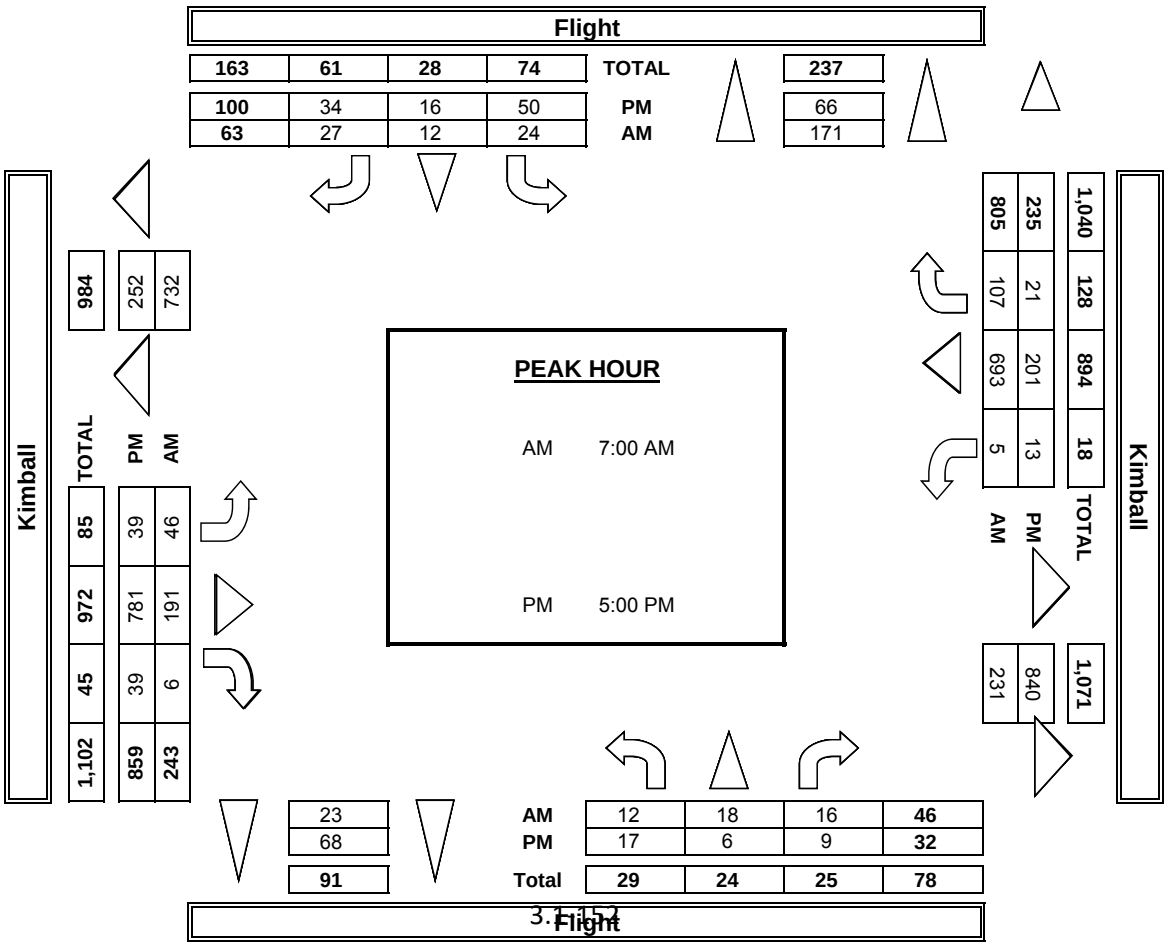


	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	1	0	2	1	4	1	0	2	1	4	0	0	0	0	0
	7:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	8:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	8:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:30 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:45 AM	0	1	2	0	3	0	0	1	0	1	0	1	1	0	2
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	1	1	8	2	12	1	0	5	1	7	0	1	3	1	5
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	5	0	5	0	0	2	0	2	0	0	3	0	3
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	1	1	0	2	0	0	0	0	0	0	1	1	0	2
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	1	3	0	4	0	0	2	0	2	0	1	1	0	2
	5:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:30 PM	0	0	2	0	2	0	0	1	0	1	0	0	1	0	1
	5:45 PM	0	0	3	0	3	0	0	1	0	1	0	0	2	0	2
	TOTAL	0	2	16	0	18	0	0	6	0	6	0	2	10	0	12

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Flight	LOCATION #:	23
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N/S

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

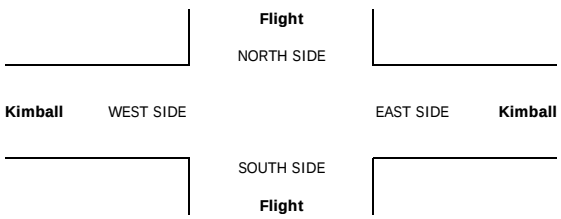
		NORTHBOUND (Flight)			SOUTHBOUND (Flight)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 1	WR 0	TOTAL
AM	7:00 AM	0	0	0	2	0	0	0	0	0	0	2	0	4
	7:15 AM	0	0	0	2	1	0	0	1	0	0	3	0	7
	7:30 AM	0	0	0	0	0	0	1	0	0	0	2	0	3
	7:45 AM	0	0	0	1	0	1	0	1	0	0	1	0	4
	8:00 AM	1	0	1	0	0	0	0	0	0	0	1	0	3
	8:15 AM	0	1	0	0	0	1	1	1	0	0	2	1	7
	8:30 AM	0	0	0	1	0	1	1	1	0	0	4	0	8
	8:45 AM	0	0	0	0	0	0	1	0	0	0	3	1	5
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1	1	1	6	1	3	4	4	0	0	18	2	41
	APPROACH %	33%	33%	33%	60%	10%	30%	50%	50%	0%	0%	90%	10%	
	APP/DEPART	3	/	7	10	/	1	8	/	11	20	/	22	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	1	1	1	1	0	2	3	2	0	0	10	2	23
	APPROACH %	33%	33%	33%	33%	0%	67%	60%	40%	0%	0%	83%	17%	
	PEAK HR FACTOR		0.375			0.375			0.625			0.750		0.719
	APP/DEPART	3	/	6	3	/	0	5	/	4	12	/	13	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	1	0	5	0	0	1	0	7
	4:15 PM	0	0	0	1	0	1	0	7	0	0	1	1	11
	4:30 PM	0	0	0	1	0	0	0	4	0	0	0	1	6
	4:45 PM	0	0	0	1	1	1	1	1	0	0	0	0	5
	5:00 PM	0	0	0	1	0	0	0	1	0	0	1	0	3
	5:15 PM	1	0	0	0	0	0	1	5	0	0	1	0	8
	5:30 PM	0	0	0	1	0	0	0	2	1	0	0	0	4
	5:45 PM	0	0	0	0	0	1	0	3	0	0	1	0	5
	VOLUMES	1	0	0	5	1	4	2	28	1	0	5	2	49
	APPROACH %	100%	0%	0%	50%	10%	40%	6%	90%	3%	0%	71%	29%	
	APP/DEPART	1	/	4	10	/	2	31	/	33	7	/	10	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	0	0	3	1	3	1	17	0	0	2	2	29
	APPROACH %	0%	0%	0%	43%	14%	43%	6%	94%	0%	0%	50%	50%	
	PEAK HR FACTOR		0.000			0.583			0.643			0.500		0.659
	APP/DEPART	0	/	3	7	/	1	18	/	20	4	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Flight	LOCATION #:	23
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N/S

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Flight)			SOUTHBOUND (Flight)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 1	WR 0	TOTAL
7:00 AM	0	0	0	0	0	0	1	1	0	0	2	0	4
7:15 AM	0	0	0	0	0	0	2	0	0	0	0	0	2
7:30 AM	0	0	0	2	0	0	0	1	0	0	3	0	6
7:45 AM	0	0	0	2	0	0	0	0	0	0	1	2	5
8:00 AM	0	0	0	3	0	0	0	1	0	0	1	0	5
8:15 AM	0	0	0	0	0	1	0	0	0	0	2	4	7
8:30 AM	0	0	0	2	0	0	1	1	0	0	1	1	6
8:45 AM	0	0	0	3	0	0	0	0	0	0	3	0	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	12	0	1	4	4	0	0	13	7	41
APPROACH %	0%	0%	0%	92%	0%	8%	50%	50%	0%	0%	65%	35%	
APP/DEPART	0	/	11	13	/	0	8	/	16	20	/	14	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	0	0	8	0	1	1	2	0	0	7	5	24
APPROACH %	0%	0%	0%	89%	0%	11%	33%	67%	0%	0%	58%	42%	
PEAK HR FACTOR		0.000			0.750			0.375			0.500		0.857
APP/DEPART	0	/	6	9	/	0	3	/	10	12	/	8	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
4:15 PM	0	0	0	0	0	1	0	0	0	0	2	0	3
4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	2	2	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	1	0	0	0	1	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	2	4	4	0	0	5	0	15
APPROACH %	0%	0%	0%	0%	0%	100%	50%	50%	0%	0%	100%	0%	
APP/DEPART	0	/	4	2	/	0	8	/	4	5	/	7	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	0	0	0	0	1	3	4	0	0	3	0	11
APPROACH %	0%	0%	0%	0%	0%	100%	43%	57%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.250			0.438			0.375		0.688
APP/DEPART	0	/	3	1	/	0	7	/	4	3	/	4	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Flight	LOCATION #:	23
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N/S

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Flight			SOUTHBOUND Flight			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 1	WR 0	TOTAL
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	1	0	1	0	0	1	0	3
7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	2
8:30 AM	0	0	0	0	0	1	1	0	0	0	2	0	4
8:45 AM	0	0	0	1	0	0	5	0	0	0	0	0	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	1	0	4	7	4	0	0	3	0	19
APPROACH %	0%	0%	0%	20%	0%	80%	64%	36%	0%	0%	100%	0%	
APP/DEPART	0	/	7	5	/	0	11	/	5	3	/	7	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	0	0	1	0	2	7	1	0	0	2	0	13
APPROACH %	0%	0%	0%	33%	0%	67%	88%	13%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.750			0.400			0.250		0.542
APP/DEPART	0	/	7	3	/	0	8	/	2	2	/	4	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	1	0	0	1	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	2
VOLUMES	0	0	0	1	0	1	6	0	0	0	0	0	8
APPROACH %	0%	0%	0%	50%	0%	50%	100%	0%	0%	0%	0%	0%	
APP/DEPART	0	/	6	2	/	0	6	/	1	0	/	1	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	0	0	0	0	1	3	0	0	0	0	0	4
APPROACH %	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	
PEAK HR FACTOR		0.000			0.250			0.375			0.000		0.500
APP/DEPART	0	/	3	1	/	0	3	/	0	0	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Meadow Valley
EAST & WEST: Kimball

PROJECT #: SC0916
LOCATION #: 24
CONTROL: STOP N

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Meadow Valley)			SOUTHBOUND (Meadow Valley)			EASTBOUND (Kimball)			WESTBOUND (Kimball)				U-TURNS					RTOR			
	LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	18	0	5	0	0	0	0	70	3	7	190	0	293	0	0	1	0	1	0	0	0	0
	7:15 AM	12	0	5	0	0	0	0	60	1	4	178	0	260	0	0	0	0	0	0	0	0	0
	7:30 AM	12	0	4	0	0	0	0	53	3	1	188	0	261	0	0	0	0	0	0	0	0	0
	7:45 AM	11	0	6	0	0	0	0	37	4	8	191	0	257	0	0	0	0	0	0	0	0	0
	8:00 AM	11	0	4	0	0	0	0	55	2	7	154	0	233	0	0	0	0	0	0	0	0	0
	8:15 AM	7	0	6	0	0	0	0	58	2	5	147	0	225	0	0	0	0	0	0	0	0	0
	8:30 AM	8	0	9	0	0	0	0	73	4	3	137	0	234	0	0	0	0	0	0	0	0	0
	8:45 AM	8	0	7	0	0	0	0	71	3	3	98	0	190	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	87	0	46	0	0	0	0	477	22	38	1,283	0	1,954	0	0	1	0	1	0	0	0	0
	APPROACH %	65%	0%	35%	0%	0%	0%	0%	95%	4%	3%	97%	0%										
	APP/DEPART	133	/	0	0	/	60	500	/	523	1,321	/	1,371	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	53	0	20	0	0	0	0	220	11	20	747	0	1,072						0	0	0	0
	APPROACH %	73%	0%	27%	0%	0%	0%	0%	95%	5%	3%	97%	0%										
	PEAK HR FACTOR		0.793			0.000			0.784			0.964		0.912									
	APP/DEPART	73	/	0	0	/	31	232	/	240	767	/	801	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	5	0	1	0	0	0	0	117	9	5	45	0	182	0	0	0	0	0	0	0	0	0
	4:15 PM	6	0	2	0	0	0	0	160	12	7	62	0	249	0	0	0	0	0	0	0	0	0
	4:30 PM	3	0	6	0	0	0	0	162	9	1	49	0	230	0	0	2	0	2	0	0	0	0
	4:45 PM	3	0	3	0	0	0	0	189	7	5	74	0	281	0	0	0	0	0	0	0	0	0
	5:00 PM	3	0	1	0	0	0	0	176	5	2	54	0	241	0	0	0	0	0	0	0	0	0
	5:15 PM	2	0	5	0	0	0	0	197	10	4	57	0	275	0	0	0	0	0	0	0	0	0
	5:30 PM	11	0	2	0	0	0	0	232	10	6	54	0	315	0	0	0	0	0	0	0	0	0
	5:45 PM	5	0	6	0	0	0	0	187	10	3	60	1	272	0	0	0	0	0	0	0	0	0
	VOLUMES	38	0	26	0	0	0	0	1,420	72	33	455	1	2,047	0	0	2	0	2	0	0	0	0
	APPROACH %	59%	0%	41%	0%	0%	0%	0%	95%	5%	7%	93%	0%										
	APP/DEPART	64	/	1	0	/	105	1,494	/	1,446	489	/	495	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	19	0	11	0	0	0	0	794	32	17	239	0	1,112						0	0	0	0
	APPROACH %	63%	0%	37%	0%	0%	0%	0%	96%	4%	7%	93%	0%										
	PEAK HR FACTOR		0.577			0.000			0.853			0.810		0.883									
	APP/DEPART	30	/	0	0	/	49	826	/	805	256	/	258	0									

Meadow Valley
NORTH SIDE

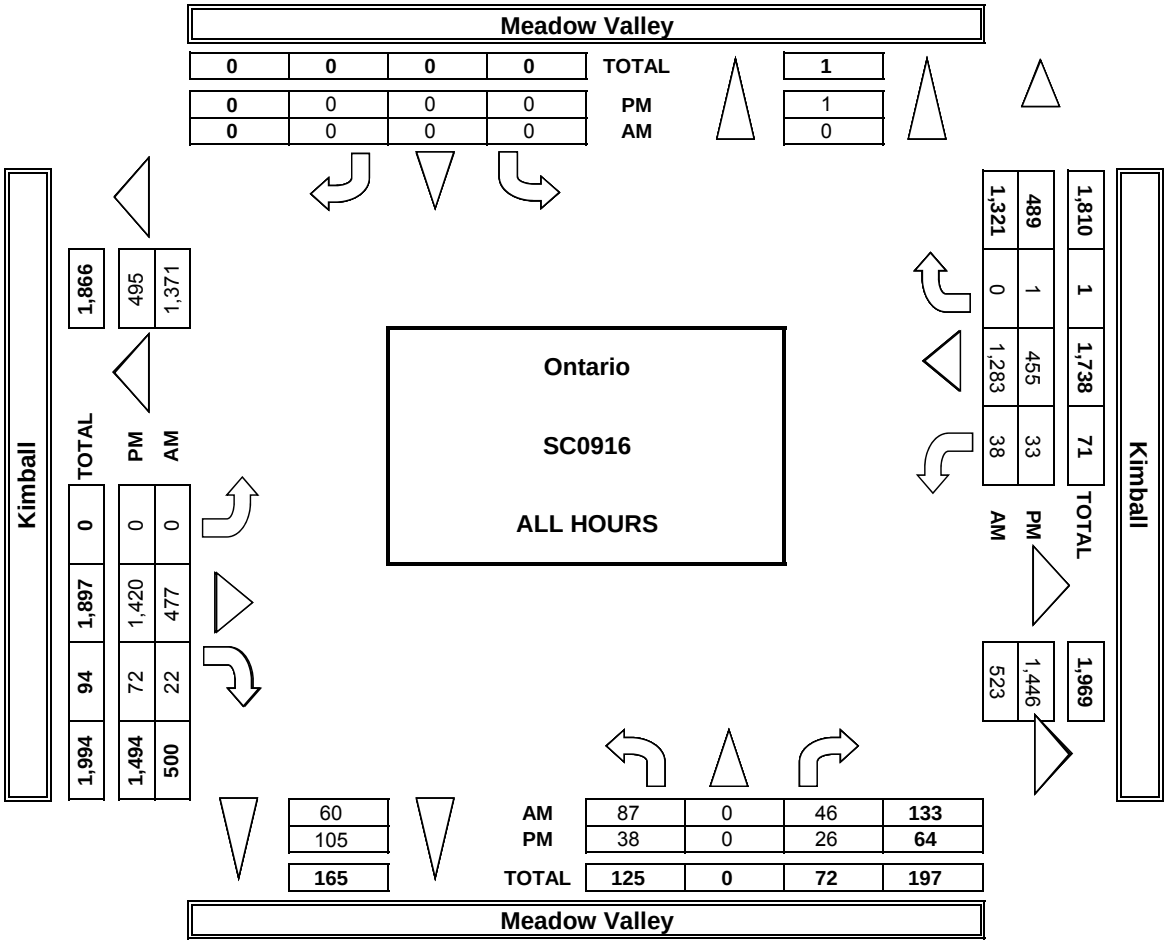
Kimball WEST SIDE EAST SIDE Kimball

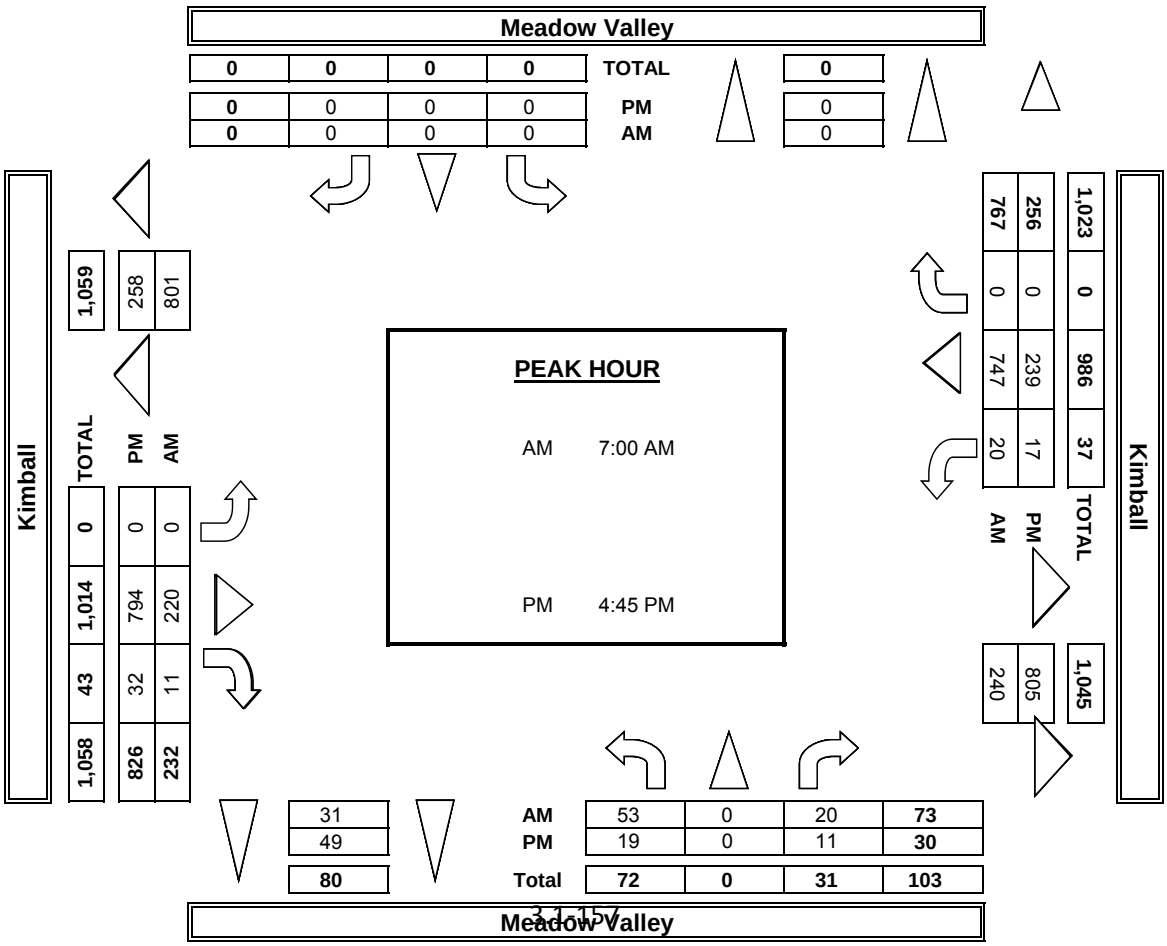
SOUTH SIDE
Meadow Valley

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	1	1	2	0	0	1	0	1	0	0	0	1	1
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	8:00 AM	0	0	3	0	3	0	0	2	0	2	0	0	1	0	1
	8:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	2	1	3	0	0	1	0	1	0	0	1	1	2
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	8	2	10	0	0	5	0	5	0	0	3	2	5
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	1	3	0	5	0	0	2	0	2	1	1	1	0	3
	4:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	4:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	0	0	4	0	4	0	0	0	0	0	0	0	4	0	4
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	2	1	3	0	0	0	0	0	0	0	2	1	3
	5:45 PM	0	0	4	0	4	0	0	0	0	0	0	0	4	0	4
	TOTAL	1	1	16	1	19	0	0	2	0	2	1	1	14	1	17

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Meadow Valley	LOCATION #:	24
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N

CLASS 2:	NOTES:
2-AXLE WORK VEHICLES/ TRUCKS	

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND Meadow Valley			SOUTHBOUND Meadow Valley			EASTBOUND Kimball			WESTBOUND Kimball			
	LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	1	0	0	0	0	0	0	0	0	0	1	0	2
	7:30 AM	1	0	0	0	0	0	0	2	0	0	2	0	5
	7:45 AM	0	0	1	0	0	0	0	1	1	0	3	0	6
	8:00 AM	0	0	0	0	0	0	0	3	0	0	2	0	5
	8:15 AM	0	0	0	0	0	0	0	2	0	0	4	0	6
	8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
	8:45 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	2	0	1	0	0	0	0	9	1	0	16	0	29
	APPROACH %	67%	0%	33%	0%	0%	0%	0%	90%	10%	0%	100%	0%	
	APP/DEPART	3	/	0	0	/	1	10	/	10	16	/	18	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	1	0	1	0	0	0	0	8	1	0	11	0	22
	APPROACH %	50%	0%	50%	0%	0%	0%	0%	89%	11%	0%	100%	0%	
	PEAK HR FACTOR		0.500			0.000			0.750			0.688		0.917
	APP/DEPART	2	/	0	0	/	1	9	/	9	11	/	12	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	4	2	0	1	0	7
	4:15 PM	0	0	0	0	0	0	0	6	0	0	1	0	7
	4:30 PM	0	0	0	0	0	0	0	5	1	0	0	0	6
	4:45 PM	0	0	1	0	0	0	0	4	0	1	0	0	6
	5:00 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
	5:15 PM	0	0	1	0	0	0	0	3	0	0	0	0	4
	5:30 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
	5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
	VOLUMES	0	0	2	0	0	0	0	27	3	1	6	0	40
	APPROACH %	0%	0%	100%	0%	0%	0%	0%	87%	10%	14%	86%	0%	
	APP/DEPART	2	/	0	0	/	4	31	/	29	7	/	7	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	0	1	0	0	0	0	19	3	1	2	0	27
	APPROACH %	0%	0%	100%	0%	0%	0%	0%	83%	13%	33%	67%	0%	
	PEAK HR FACTOR		0.250			0.000			0.821			0.750		0.964
	APP/DEPART	1	/	0	0	/	4	23	/	20	3	/	3	0

U-TURNS					
NB	SB	EB	WB	TTL	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Meadow Valley	LOCATION #:	24
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

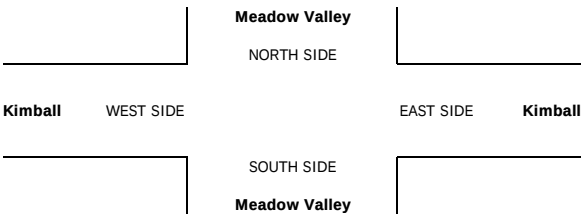
	NORTHBOUND Meadow Valley			SOUTHBOUND Meadow Valley			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
7:30 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
8:00 AM	0	0	0	0	0	0	0	1	0	0	3	0	4
8:15 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
8:30 AM	0	0	0	0	0	0	0	1	0	0	3	0	4
8:45 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	10	0	0	16	0	26
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	0	10	/	10	16	/	16	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	0	0	0	0	0	0	0	6	0	0	10	0	16
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.750			0.833		1.000
APP/DEPART	0	/	0	0	/	0	6	/	6	10	/	10	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	4	0	0	6	0	10
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	0	4	/	4	6	/	6	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	0	0	0	0	0	0	3	0	0	5	0	8
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.375			0.625		0.667
APP/DEPART	0	/	0	0	/	0	3	/	3	5	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Meadow Valley	LOCATION #:	24
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP N

CLASS 4:	NOTES:
4 OR MORE AXLE TRUCKS	

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

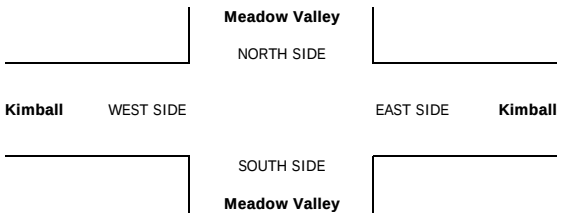
	NORTHBOUND Meadow Valley			SOUTHBOUND Meadow Valley			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 2	ER 0	WL 1	WT 1	WR X	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:45 AM	0	0	0	0	0	0	0	1	0	1	0	0	2
8:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	3	0	2	3	0	8
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	40%	60%	0%	
APP/DEPART	0	/	0	0	/	2	3	/	3	5	/	3	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	0	0	0	0	0	0	0	2	0	2	2	0	6
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	50%	50%	0%	
PEAK HR FACTOR		0.000			0.000			0.500			1.000		0.750
APP/DEPART	0	/	0	0	/	2	2	/	2	4	/	2	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	1	0	0	1	0	2
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	0	1	/	1	1	/	1	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	0	0	0	0	0	0	1	0	0	1	0	2
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.250			0.250		0.500
APP/DEPART	0	/	0	0	/	0	1	/	1	1	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Tue, Apr 26, 16

LOCATION: Ontario
NORTH & SOUTH: Hellman
EAST & WEST: Kimball

PROJECT #: SC0916
LOCATION #: 26
CONTROL: STOP ALL

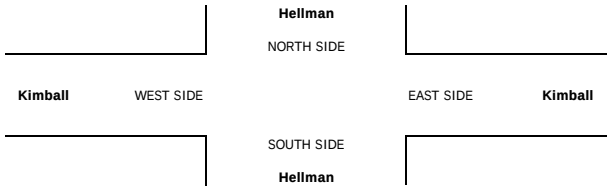
NOTES:

AM / PM / MD / OTHER / OTHER

N / W / E / S

Add U-Turns to Left Turns

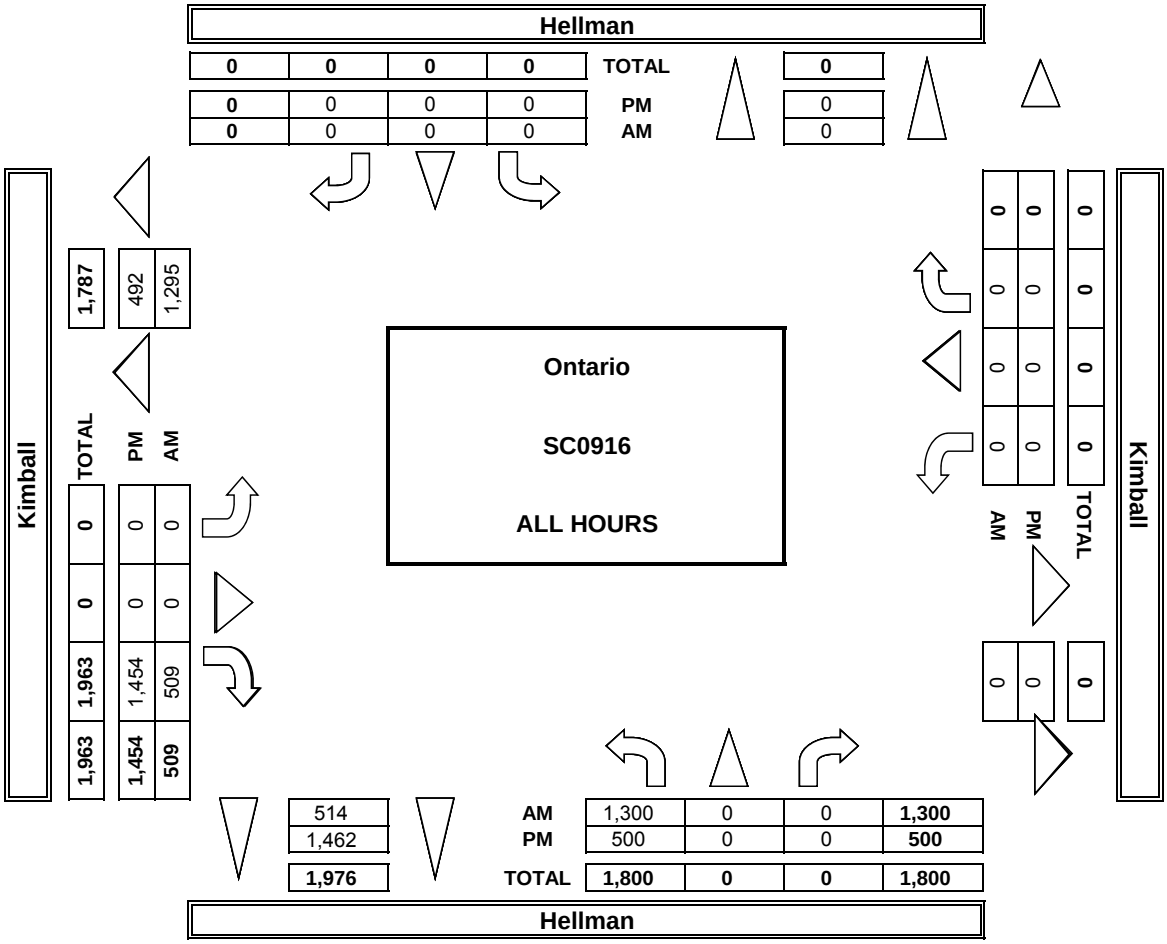
		NORTHBOUND (Hellman)			SOUTHBOUND (Hellman)			EASTBOUND (Kimball)			WESTBOUND (Kimball)				U-TURNS					RTOR			
	LANES:	NL 1	NT X	NR X	SL X	ST X	SR X	EL X	ET X	ER 1	WL X	WT X	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	188	0	0	0	0	0	0	0	58	0	0	0	246	0	0	0	0	0	0	0	0	0
	7:15 AM	190	0	0	0	0	0	0	0	68	0	0	0	258	0	0	0	0	0	0	0	0	0
	7:30 AM	197	0	0	0	0	0	0	0	49	0	0	0	246	0	0	0	0	0	0	0	0	0
	7:45 AM	154	0	0	0	0	0	0	0	55	0	0	0	209	2	0	0	0	2	0	0	0	0
	8:00 AM	160	0	0	0	0	0	0	0	64	0	0	0	224	1	0	0	0	1	0	0	0	0
	8:15 AM	159	0	0	0	0	0	0	0	67	0	0	0	226	0	0	0	0	0	0	0	0	0
	8:30 AM	145	0	0	0	0	0	0	0	66	0	0	0	211	0	0	0	0	0	0	0	0	0
	8:45 AM	107	0	0	0	0	0	0	0	82	0	0	0	189	2	0	0	0	2	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1,300	0	0	0	0	0	0	0	509	0	0	0	1,809	5	0	0	0	5	0	0	0	0
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%										
	APP/DEPART	1,300	/	0	0	/	514	509	/	0	0	/	1,295	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	729	0	0	0	0	0	0	0	230	0	0	0	959						0	0	0	0
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%										
	PEAK HR FACTOR		0.925			0.000			0.846			0.000		0.929									
	APP/DEPART	729	/	0	0	/	232	230	/	0	0	/	727	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	67	0	0	0	0	0	0	0	142	0	0	0	209	2	0	0	0	2	0	0	0	0
	4:15 PM	66	0	0	0	0	0	0	0	168	0	0	0	234	3	0	0	0	3	0	0	0	0
	4:30 PM	61	0	0	0	0	0	0	0	170	0	0	0	231	1	0	0	0	1	0	0	0	0
	4:45 PM	77	0	0	0	0	0	0	0	174	0	0	0	251	0	0	0	0	0	0	0	0	0
	5:00 PM	61	0	0	0	0	0	0	0	185	0	0	0	246	0	0	0	0	0	0	0	0	0
	5:15 PM	58	0	0	0	0	0	0	0	202	0	0	0	260	0	0	0	0	0	0	0	0	0
	5:30 PM	52	0	0	0	0	0	0	0	225	0	0	0	277	1	0	0	0	1	0	0	0	0
	5:45 PM	58	0	0	0	0	0	0	0	188	0	0	0	246	1	0	0	0	1	0	0	0	0
	VOLUMES	500	0	0	0	0	0	0	0	1,454	0	0	0	1,954	8	0	0	0	8	0	0	0	0
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%										
	APP/DEPART	500	/	0	0	/	1,462	1,454	/	0	0	/	492	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	248	0	0	0	0	0	0	0	786	0	0	0	1,034						0	0	0	0
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%										
	PEAK HR FACTOR		0.805			0.000			0.873			0.000		0.933									
	APP/DEPART	248	/	0	0	/	787	786	/	0	0	/	247	0									

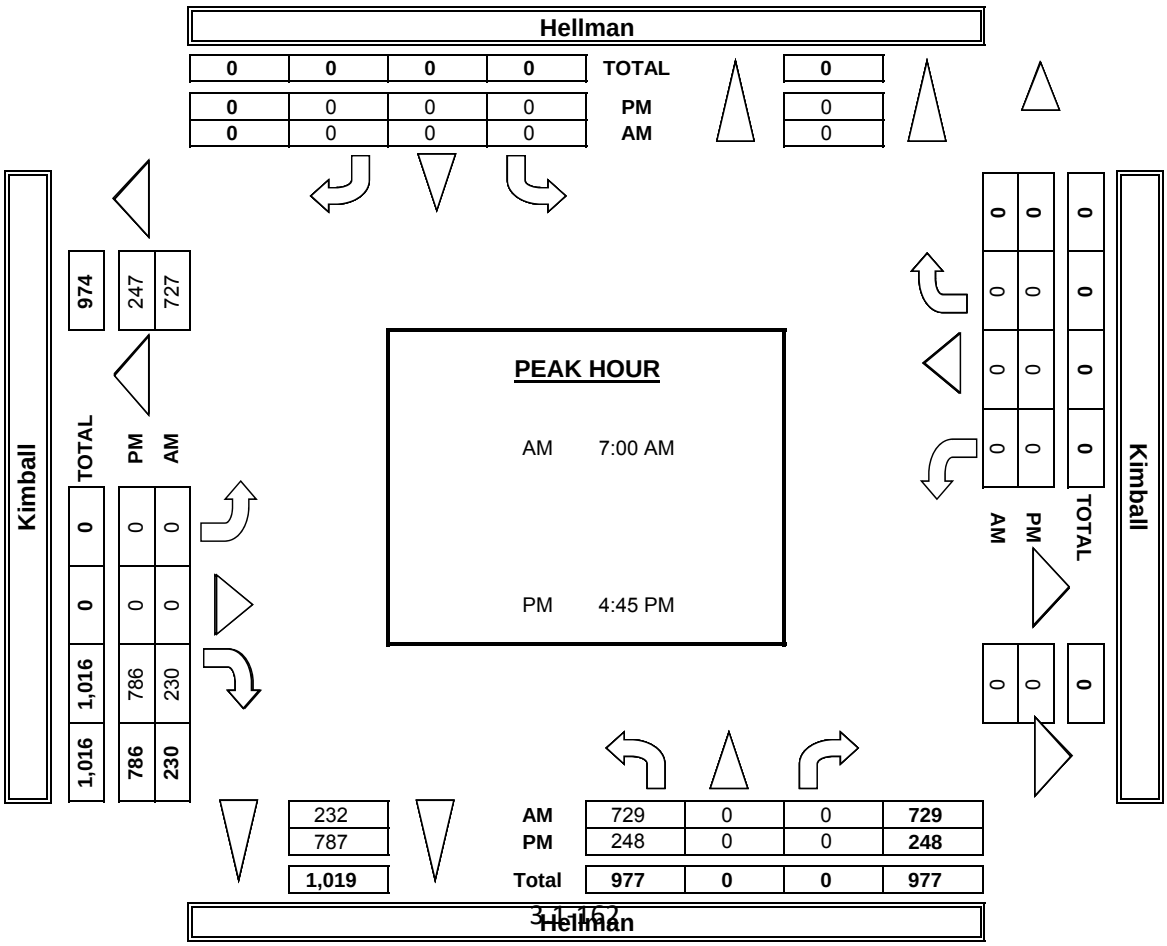


	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	2	0	1	0	3	1	0	1	0	2	1	0	0	0	1
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	4:45 PM	0	3	3	0	6	0	0	0	0	0	0	3	3	0	6
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	3	0	3	0	0	2	0	2	0	0	1	0	1
	TOTAL	1	3	8	0	12	1	0	3	0	4	0	3	5	0	8

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Hellman	LOCATION #:	26
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP ALL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Hellman)			SOUTHBOUND (Hellman)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
	LANES:	NL 1	NT X	NR X	SL X	ST X	SR X	EL X	ET X	ER 1	WL X	WT X	WR X	TOTAL
AM	7:00 AM	2	0	0	0	0	0	0	0	0	0	0	0	2
	7:15 AM	1	0	0	0	0	0	0	0	2	0	0	0	3
	7:30 AM	2	0	0	0	0	0	0	0	1	0	0	0	3
	7:45 AM	3	0	0	0	0	0	0	0	2	0	0	0	5
	8:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	1
	8:15 AM	2	0	0	0	0	0	0	0	2	0	0	0	4
	8:30 AM	3	0	0	0	0	0	0	0	2	0	0	0	5
	8:45 AM	1	0	0	0	0	0	0	0	1	0	0	0	2
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	14	0	0	0	0	0	0	0	11	0	0	0	25
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
	APP/DEPART	14	/	0	0	/	12	11	/	0	0	/	13	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	7	0	0	0	0	0	0	0	7	0	0	0	15
	APPROACH %	88%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
	PEAK HR FACTOR		0.667			0.000			0.875			0.000		0.750
	APP/DEPART	8	/	0	0	/	8	7	/	0	0	/	7	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	0	0	0	0	0	0	0	2	0	0	0	3
	4:15 PM	2	0	0	0	0	0	0	0	6	0	0	0	8
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	2	0	0	0	0	0	0	0	3	0	0	0	5
	5:00 PM	1	0	0	0	0	0	0	0	4	0	0	0	5
	5:15 PM	0	0	0	0	0	0	0	0	6	0	0	0	6
	5:30 PM	0	0	0	0	0	0	0	0	3	0	0	0	3
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	6	0	0	0	0	0	0	0	24	0	0	0	30
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
	APP/DEPART	6	/	0	0	/	24	24	/	0	0	/	6	0
	BEGIN PEAK HR		4:45 PM											
	VOLUMES	3	0	0	0	0	0	0	0	16	0	0	0	19
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
	PEAK HR FACTOR		0.375			0.000			0.667			0.000		0.792
	APP/DEPART	3	/	0	0	/	16	16	/	0	0	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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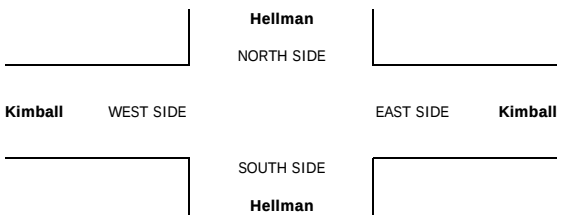
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Hellman	LOCATION #:	26
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP ALL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Hellman)			SOUTHBOUND (Hellman)			EASTBOUND (Kimball)			WESTBOUND (Kimball)			
	LANES:	NL 1	NT X	NR X	SL X	ST X	SR X	EL X	ET X	ER 1	WL X	WT X	WR X	TOTAL
AM	7:00 AM	1	0	0	0	0	0	0	0	1	0	0	0	2
	7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	1
	7:30 AM	2	0	0	0	0	0	0	0	3	0	0	0	5
	7:45 AM	1	0	0	0	1	0	0	0	1	0	0	0	3
	8:00 AM	3	0	0	0	0	0	0	0	0	0	0	0	3
	8:15 AM	5	0	0	0	0	0	0	0	1	0	0	0	6
	8:30 AM	3	0	0	0	0	0	0	0	1	0	0	0	4
	8:45 AM	1	0	0	0	0	0	0	0	2	0	0	0	3
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	16	0	0	0	1	0	0	0	10	0	0	0	27
	APPROACH %	100%	0%	0%	0%	100%	0%	0%	0%	100%	0%	0%	0%	
	APP/DEPART	16	/	0	1	/	11	10	/	0	0	/	16	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	11	0	0	0	1	0	0	0	5	0	0	0	17
	APPROACH %	100%	0%	0%	0%	100%	0%	0%	0%	100%	0%	0%	0%	
	PEAK HR FACTOR		0.550			0.250			0.417			0.000		0.708
	APP/DEPART	11	/	0	1	/	6	5	/	0	0	/	11	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	0	0	0	0	0	0	0	1	0	0	0	2
	4:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	1	0	0	0	0	0	0	0	1	0	0	0	2
	5:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
	5:45 PM	0	0	0	0	0	0	0	0	2	0	0	0	2
	VOLUMES	5	0	0	0	0	0	0	0	4	0	0	0	9
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
	APP/DEPART	5	/	0	0	/	4	4	/	0	0	/	5	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	3	0	0	0	0	0	0	0	2	0	0	0	5
	APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
	PEAK HR FACTOR		0.750			0.000			0.500			0.000		0.625
	APP/DEPART	3	/	0	0	/	2	2	/	0	0	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/26/16	NORTH & SOUTH:	Hellman	LOCATION #:	26
TUESDAY	EAST & WEST:	Kimball	CONTROL:	STOP ALL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

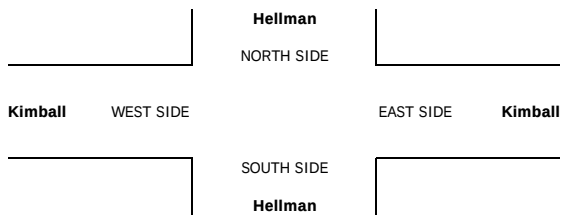
	NORTHBOUND Hellman			SOUTHBOUND Hellman			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT X	NR X	SL X	ST X	SR X	EL X	ET X	ER 1	WL X	WT X	WR X	TOTAL
7:00 AM	1	0	0	0	0	0	0	0	1	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	2	0	0	0	0	0	0	0	1	0	0	0	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	1
8:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	1	0	0	0	0	0	0	0	2	0	0	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	5	0	0	0	0	0	0	0	5	0	0	0	10
APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
APP/DEPART	5	/	0	0	/	6	5	/	0	0	/	4	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	2	0	0	0	0	0	0	0	3	0	0	0	5
APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
PEAK HR FACTOR		0.250			0.000			0.375			0.000		0.417
APP/DEPART	2	/	0	0	/	3	3	/	0	0	/	2	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
4:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	0	0	0	0	0	0	0	2	0	0	0	3
APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
APP/DEPART	1	/	0	0	/	2	2	/	0	0	/	1	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	0	0	0	0	0	0	0	2	0	0	0	3
APPROACH %	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
PEAK HR FACTOR		0.250			0.000			0.500			0.000		0.750
APP/DEPART	1	/	0	0	/	2	2	/	0	0	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Thu, Apr 21, 16

LOCATION: Ontario
NORTH & SOUTH: Archibald
EAST & WEST: Limonite

PROJECT #: SC0916
LOCATION #: 36
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Archibald)			SOUTHBOUND (Archibald)			EASTBOUND (Limonite)			WESTBOUND (Limonite)				U-TURNS					RTOR			
	LANES:	NL X	NT 1	NR 1	SL 1	ST 1	SR X	EL X	ET X	ER X	WL 1	WT X	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	149	47	24	91	0	0	0	0	97	0	143	551	0	0	0	0	0	0	0	0	13
	7:15 AM	0	158	80	34	91	0	0	0	0	95	0	164	622	0	0	0	0	0	0	0	0	14
	7:30 AM	0	157	66	37	86	0	0	0	0	79	0	192	617	0	0	0	0	0	0	0	0	24
	7:45 AM	0	158	65	44	95	0	0	0	0	65	0	168	595	0	0	0	0	0	0	0	0	11
	8:00 AM	0	158	49	46	72	0	0	0	0	72	0	115	512	0	0	0	0	0	0	0	0	10
	8:15 AM	0	158	54	44	82	0	0	0	0	71	0	116	525	0	0	0	0	0	0	0	0	15
	8:30 AM	0	171	79	34	80	0	0	0	0	72	0	107	543	0	0	0	0	0	0	0	0	17
	8:45 AM	0	137	44	38	92	0	0	0	0	69	0	87	467	0	0	0	0	0	0	0	0	13
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	1,246	484	301	689	0	0	0	0	620	0	1,092	4,432	0	0	0	0	0	0	0	0	117
	APPROACH %	0%	72%	28%	30%	70%	0%	0%	0%	0%	36%	0%	64%										
	APP/DEPART	1,730	/	2,338	990	/	1,309	0	/	785	1,712	/	0	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	0	622	258	139	363	0	0	0	0	336	0	667	2,385						0	0	0	62
	APPROACH %	0%	71%	29%	28%	72%	0%	0%	0%	0%	33%	0%	67%										
	PEAK HR FACTOR		0.924			0.903			0.000			0.925		0.959									
	APP/DEPART	880	/	1,289	502	/	699	0	/	397	1,003	/	0	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	102	97	110	168	0	0	0	0	65	0	53	595	0	0	0	0	0	0	0	0	6
	4:15 PM	0	101	95	102	178	0	0	0	0	77	0	45	598	0	0	0	0	0	0	0	0	9
	4:30 PM	0	85	85	113	155	0	0	0	0	63	0	46	547	0	0	0	0	0	0	0	0	11
	4:45 PM	0	100	81	153	186	0	0	0	0	73	0	49	642	0	0	0	0	0	0	0	0	13
	5:00 PM	0	76	86	120	186	0	0	0	0	79	0	55	602	0	0	0	0	0	0	0	0	12
	5:15 PM	0	107	98	140	220	0	0	0	0	110	0	56	731	0	0	0	0	0	0	0	0	6
	5:30 PM	0	88	100	136	189	0	0	0	0	73	0	42	628	0	0	0	0	0	0	0	0	6
	5:45 PM	0	87	76	117	175	0	0	1	0	80	0	51	587	0	0	0	0	0	0	0	0	7
	VOLUMES	0	746	718	991	1,457	0	0	1	0	620	0	397	4,930	0	0	0	0	0	0	0	0	70
	APPROACH %	0%	51%	49%	40%	60%	0%	0%	100%	0%	61%	0%	39%										
	APP/DEPART	1,464	/	1,143	2,448	/	2,077	1	/	1,710	1,017	/	0	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	0	371	365	549	781	0	0	0	0	335	0	202	2,603						0	0	0	37
	APPROACH %	0%	50%	50%	41%	59%	0%	0%	0%	0%	62%	0%	38%										
	PEAK HR FACTOR		0.898			0.924			0.000			0.809		0.890									
	APP/DEPART	736	/	573	1,330	/	1,116	0	/	914	537	/	0	0									

Archibald

NORTH SIDE

Limonite WEST SIDE EAST SIDE **Limonite**

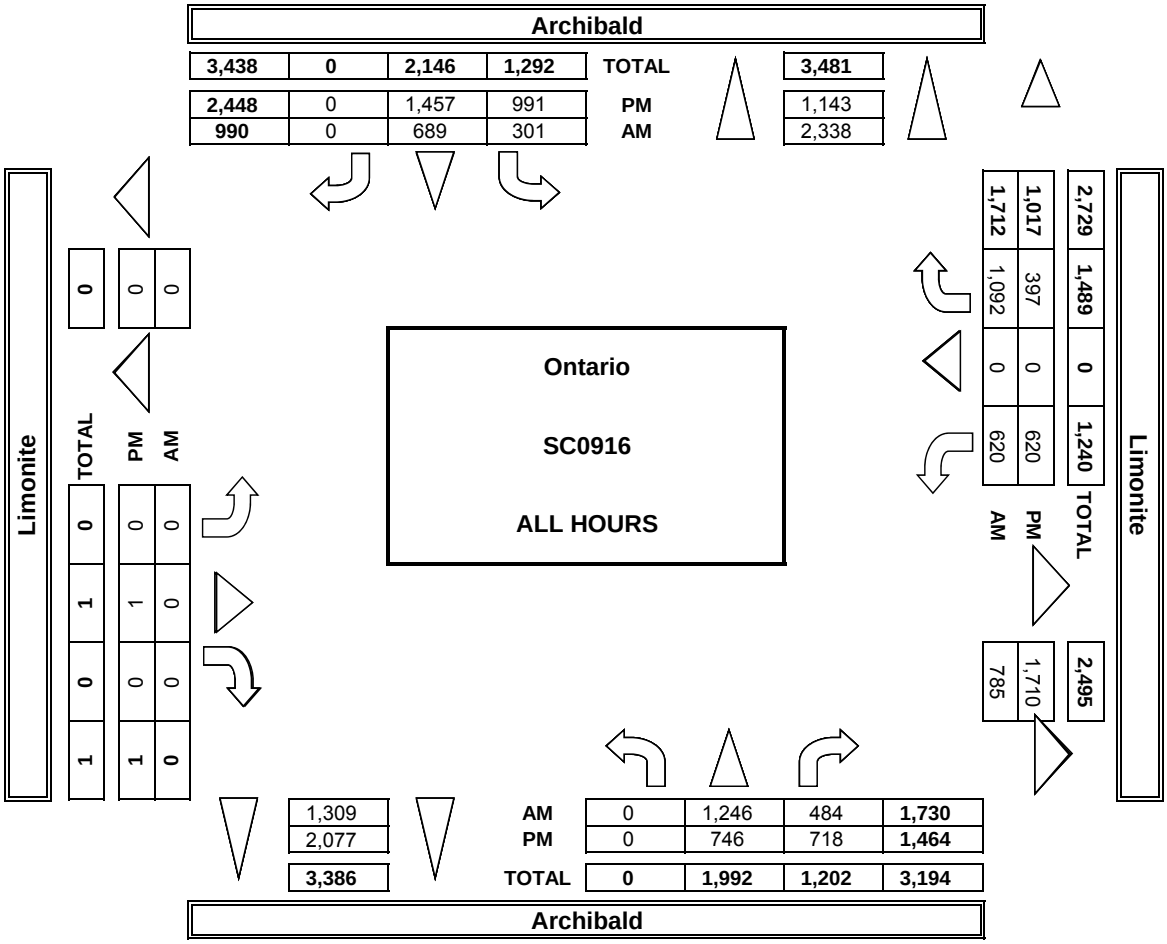
SOUTH SIDE

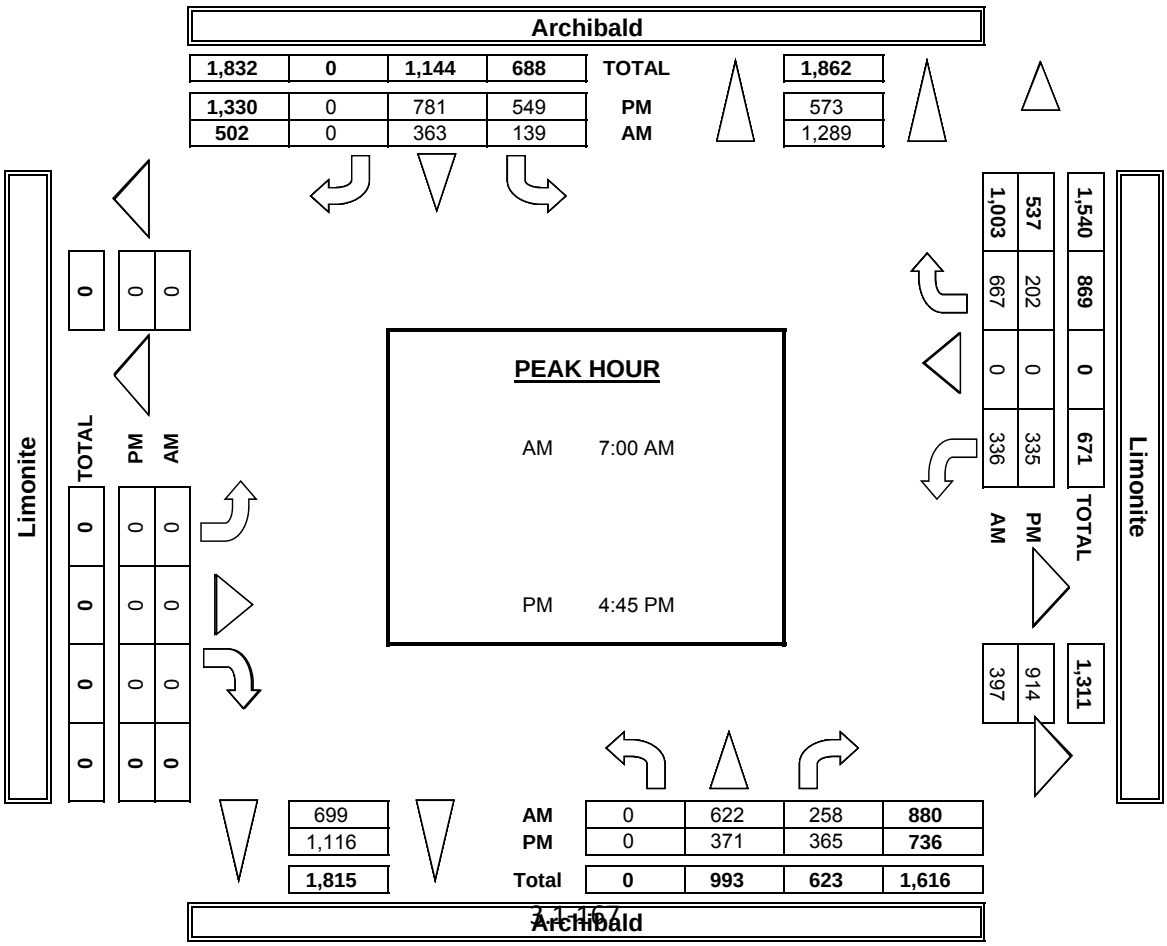
Archibald

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	1	1	0	0	2	0	0	0	0	0	1	1	0	0	2
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Archibald	LOCATION #:	36
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Archibald			SOUTHBOUND Archibald			EASTBOUND Limonite			WESTBOUND Limonite			
	LANES:	NL X	NT 1	NR 1	SL 1	ST 1	SR X	EL X	ET X	ER X	WL 1	WT X	WR 1	TOTAL
AM	7:00 AM	0	10	2	4	9	0	0	0	0	4	0	5	34
	7:15 AM	0	7	1	3	13	0	0	0	0	5	0	7	36
	7:30 AM	0	7	4	3	7	0	0	0	0	3	0	4	28
	7:45 AM	0	5	3	4	12	0	0	0	0	2	0	5	31
	8:00 AM	0	10	3	1	11	0	0	0	0	3	0	3	31
	8:15 AM	0	4	2	5	10	0	0	0	0	3	0	4	28
	8:30 AM	0	7	4	0	9	0	0	0	0	2	0	3	25
	8:45 AM	0	1	1	4	8	0	0	0	0	9	0	5	28
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	51	20	24	79	0	0	0	0	31	0	36	241
	APPROACH %	0%	72%	28%	23%	77%	0%	0%	0%	0%	46%	0%	54%	
	APP/DEPART	71	/	87	103	/	110	0	/	44	67	/	0	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	29	10	14	41	0	0	0	0	14	0	21	129
	APPROACH %	0%	74%	26%	25%	75%	0%	0%	0%	0%	40%	0%	60%	
	PEAK HR FACTOR		0.813			0.859			0.000			0.729		0.896
	APP/DEPART	39	/	50	55	/	55	0	/	24	35	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	6	6	5	10	0	0	0	0	3	0	3	33
	4:15 PM	0	3	3	4	8	0	0	0	0	4	0	0	22
	4:30 PM	0	6	5	2	6	0	0	0	0	1	0	2	22
	4:45 PM	0	5	5	6	5	0	0	0	0	1	0	1	23
	5:00 PM	0	6	1	8	13	0	0	0	0	5	0	1	34
	5:15 PM	0	4	3	5	9	0	0	0	0	0	0	0	21
	5:30 PM	0	8	3	3	6	0	0	0	0	1	0	2	23
	5:45 PM	0	5	2	1	5	0	0	0	0	1	0	0	14
	VOLUMES	0	43	28	34	62	0	0	0	0	16	0	9	192
	APPROACH %	0%	61%	39%	35%	65%	0%	0%	0%	0%	64%	0%	36%	
	APP/DEPART	71	/	52	96	/	78	0	/	62	25	/	0	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	0	23	12	22	33	0	0	0	0	7	0	4	101
	APPROACH %	0%	66%	34%	40%	60%	0%	0%	0%	0%	64%	0%	36%	
	PEAK HR FACTOR		0.795			0.655			0.000			0.458		0.743
	APP/DEPART	35	/	27	55	/	40	0	/	34	11	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Archibald	LOCATION #:	36
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Archibald)			SOUTHBOUND (Archibald)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
	LANES:	NL X	NT 1	NR 1	SL 1	ST 1	SR X	EL X	ET X	ER X	WL 1	WT X	WR 1	TOTAL
AM	7:00 AM	0	3	0	1	2	0	0	0	0	1	0	0	7
	7:15 AM	0	0	1	1	3	0	0	0	0	2	0	1	8
	7:30 AM	0	3	2	1	1	0	0	0	0	3	0	0	10
	7:45 AM	0	5	2	1	2	0	0	0	0	4	0	1	15
	8:00 AM	0	2	0	1	1	0	0	0	0	2	0	1	7
	8:15 AM	0	1	1	0	1	0	0	0	0	5	0	0	8
	8:30 AM	0	2	1	0	1	0	0	0	0	0	0	1	5
	8:45 AM	0	0	1	2	3	0	0	0	0	1	0	0	7
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	16	8	7	14	0	0	0	0	18	0	4	67
	APPROACH %	0%	67%	33%	33%	67%	0%	0%	0%	0%	82%	0%	18%	
	APP/DEPART	24	/	20	21	/	32	0	/	15	22	/	0	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	11	5	3	5	0	0	0	0	14	0	2	40
	APPROACH %	0%	69%	31%	38%	63%	0%	0%	0%	0%	88%	0%	13%	
	PEAK HR FACTOR		0.571			0.500			0.000			0.800		0.667
	APP/DEPART	16	/	13	8	/	19	0	/	8	16	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	2	1	0	0	0	0	0	0	1	0	0	4
	4:15 PM	0	1	1	1	0	0	0	0	0	0	0	0	3
	4:30 PM	0	2	1	0	0	0	0	0	0	0	0	0	3
	4:45 PM	0	0	1	0	1	0	0	0	0	1	0	0	3
	5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
	5:15 PM	0	1	0	1	0	0	0	0	0	1	0	0	3
	5:30 PM	0	3	2	0	0	0	0	0	0	0	0	0	5
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	10	6	2	1	0	0	0	0	3	0	0	22
	APPROACH %	0%	63%	38%	67%	33%	0%	0%	0%	0%	100%	0%	0%	
	APP/DEPART	16	/	10	3	/	4	0	/	8	3	/	0	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	5	4	1	1	0	0	0	0	2	0	0	13
	APPROACH %	0%	56%	44%	50%	50%	0%	0%	0%	0%	100%	0%	0%	
	PEAK HR FACTOR		0.750			0.500			0.000			0.500		0.813
	APP/DEPART	9	/	5	2	/	3	0	/	5	2	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Archibald	LOCATION #:	36
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Archibald			SOUTHBOUND Archibald			EASTBOUND Limonite			WESTBOUND Limonite			
LANES:	NL X	NT 1	NR 1	SL 1	ST 1	SR X	EL X	ET X	ER X	WL 1	WT X	WR 1	TOTAL
7:00 AM	0	3	1	3	1	0	0	0	0	0	0	3	11
7:15 AM	0	5	0	1	2	0	0	0	0	3	0	3	14
7:30 AM	0	1	2	2	1	0	0	0	0	1	0	0	7
7:45 AM	0	2	1	3	1	0	0	0	0	1	0	1	9
8:00 AM	0	2	1	2	1	0	0	0	0	1	0	1	8
8:15 AM	0	6	0	2	2	0	0	0	0	1	0	1	12
8:30 AM	0	2	0	0	3	0	0	0	0	1	0	1	7
8:45 AM	0	3	0	2	0	0	0	0	0	0	0	1	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	24	5	15	11	0	0	0	0	8	0	11	74
APPROACH %	0%	83%	17%	58%	42%	0%	0%	0%	0%	42%	0%	58%	
APP/DEPART	29	/	35	26	/	19	0	/	20	19	/	0	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	11	4	9	5	0	0	0	0	5	0	7	41
APPROACH %	0%	73%	27%	64%	36%	0%	0%	0%	0%	42%	0%	58%	
PEAK HR FACTOR		0.750			0.875			0.000			0.500		0.732
APP/DEPART	15	/	18	14	/	10	0	/	13	12	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	2	0	0	0	0	0	0	0	1	0	0	3
4:15 PM	0	4	1	0	2	0	0	0	0	0	0	0	7
4:30 PM	0	2	0	0	1	0	0	0	0	1	0	0	4
4:45 PM	0	3	0	2	2	0	0	0	0	0	0	0	7
5:00 PM	0	2	0	1	0	0	0	0	0	0	0	2	5
5:15 PM	0	2	1	0	1	0	0	0	0	0	0	0	4
5:30 PM	0	5	0	0	1	0	0	0	0	1	0	0	7
5:45 PM	0	3	1	0	1	0	0	0	0	0	0	0	5
VOLUMES	0	23	3	3	8	0	0	0	0	3	0	2	42
APPROACH %	0%	88%	12%	27%	73%	0%	0%	0%	0%	60%	0%	40%	
APP/DEPART	26	/	25	11	/	11	0	/	6	5	/	0	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	0	12	1	3	4	0	0	0	0	1	0	2	23
APPROACH %	0%	92%	8%	43%	57%	0%	0%	0%	0%	33%	0%	67%	
PEAK HR FACTOR		0.650			0.438			0.000			0.375		0.821
APP/DEPART	13	/	14	7	/	5	0	/	4	3	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Thu, Apr 21, 16

LOCATION: Ontario
NORTH & SOUTH: Harrison
EAST & WEST: Limonite

PROJECT #: SC0916
LOCATION #: 37
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Harrison)			SOUTHBOUND (Harrison)			EASTBOUND (Limonite)			WESTBOUND (Limonite)				U-TURNS					RTOR			
	LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 0	EL 1	ET 3	ER 0	WL 1	WT 2	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	24	8	41	5	11	16	4	66	1	29	208	1	414	0	0	0	1	1	6	7	0	0
	7:15 AM	31	15	57	5	24	20	3	105	4	35	200	1	500	0	0	0	0	0	5	7	0	0
	7:30 AM	41	17	70	9	18	9	5	88	5	37	191	1	491	0	0	0	1	1	12	3	2	0
	7:45 AM	24	17	53	3	17	5	4	95	3	30	186	2	439	0	0	0	1	1	8	2	0	0
	8:00 AM	17	16	43	3	28	9	11	78	4	36	160	1	406	0	0	0	0	0	5	2	2	0
	8:15 AM	13	11	20	0	10	20	7	89	3	31	150	1	355	0	0	0	3	3	5	4	0	0
	8:30 AM	8	3	9	3	5	12	4	87	6	18	151	2	308	0	0	0	0	0	3	3	0	0
	8:45 AM	7	2	8	1	4	11	8	76	2	20	136	1	276	0	0	0	0	0	3	8	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	165	89	301	29	117	102	46	684	28	236	1,382	10	3,189	0	0	0	6	6	47	36	4	0
	APPROACH %	30%	16%	54%	12%	47%	41%	6%	90%	4%	14%	85%	1%										
	APP/DEPART	555	/	145	248	/	375	758	/	1,020	1,628	/	1,649	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	120	57	221	22	70	50	16	354	13	131	785	5	1,844						31	19	2	0
	APPROACH %	30%	14%	56%	15%	49%	35%	4%	92%	3%	14%	85%	1%										
	PEAK HR FACTOR		0.777			0.724			0.855			0.967		0.922									
	APP/DEPART	398	/	78	142	/	211	383	/	600	921	/	955	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	6	6	15	1	4	5	20	183	10	45	113	3	411	0	0	0	0	0	3	1	0	0
	4:15 PM	7	8	41	3	3	5	8	193	9	52	101	0	430	0	0	0	3	3	10	2	0	0
	4:30 PM	8	9	44	5	11	8	16	141	9	49	105	0	405	0	0	0	1	1	8	3	0	0
	4:45 PM	8	12	40	3	5	2	14	203	8	48	110	5	458	0	0	0	4	4	5	0	0	0
	5:00 PM	8	8	31	1	9	5	21	178	10	41	114	1	427	0	0	0	1	1	2	1	0	0
	5:15 PM	15	15	42	3	4	12	17	207	8	54	129	1	507	0	0	0	4	4	9	5	0	0
	5:30 PM	5	9	33	4	7	4	19	179	14	55	110	2	441	0	0	0	3	3	10	0	1	0
	5:45 PM	6	14	48	7	8	7	18	170	15	56	100	3	452	0	0	0	4	4	5	0	1	0
	VOLUMES	63	81	294	27	51	48	133	1,454	83	400	882	15	3,531	0	0	0	20	20	52	12	2	0
	APPROACH %	14%	18%	67%	21%	40%	38%	8%	87%	5%	31%	68%	1%										
	APP/DEPART	438	/	229	126	/	514	1,670	/	1,795	1,297	/	993	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	36	44	146	11	25	23	71	767	40	198	463	9	1,833						26	6	1	0
	APPROACH %	16%	19%	65%	19%	42%	39%	8%	87%	5%	30%	69%	1%										
	PEAK HR FACTOR		0.785			0.776			0.946			0.910		0.904									
	APP/DEPART	226	/	124	59	/	251	878	/	936	670	/	522	0									

Harrison

NORTH SIDE

Limonite WEST SIDE EAST SIDE **Limonite**

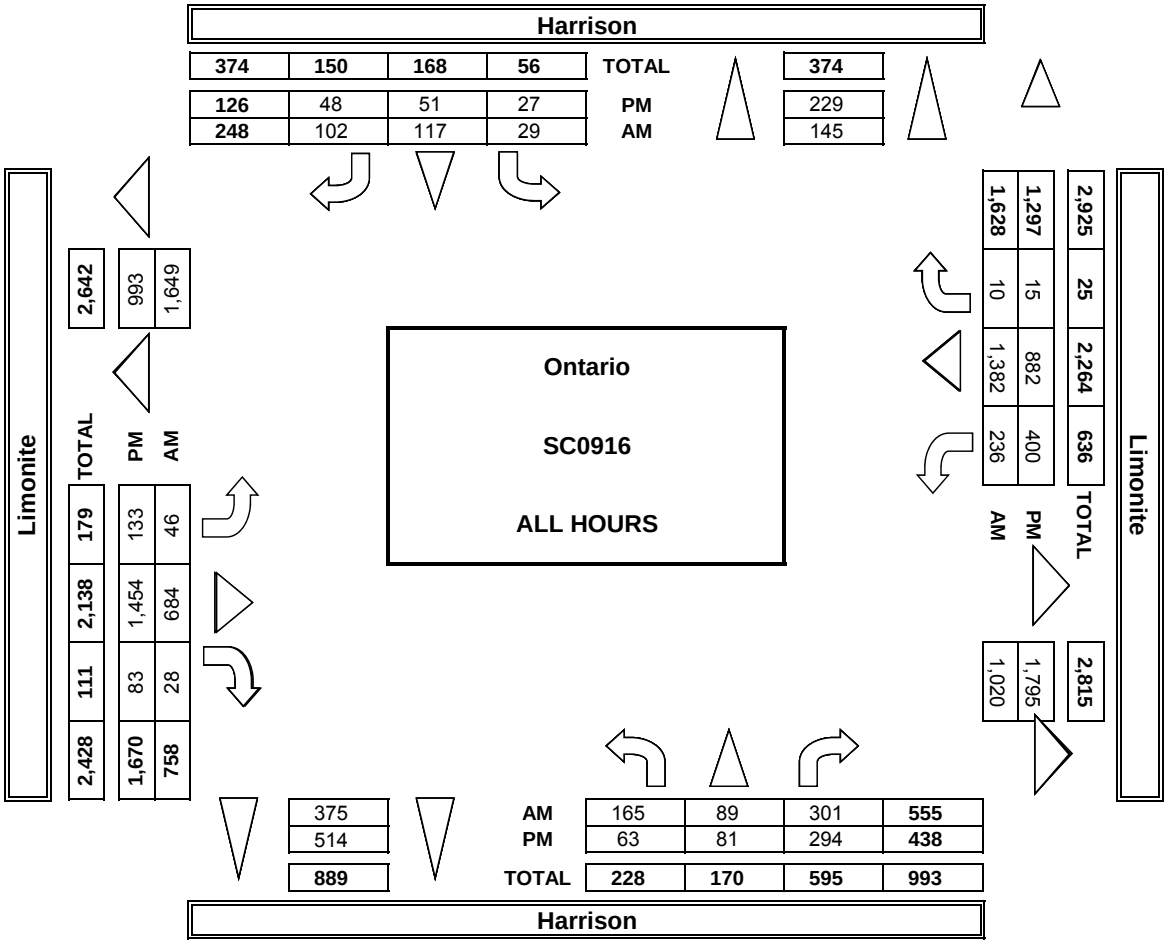
SOUTH SIDE

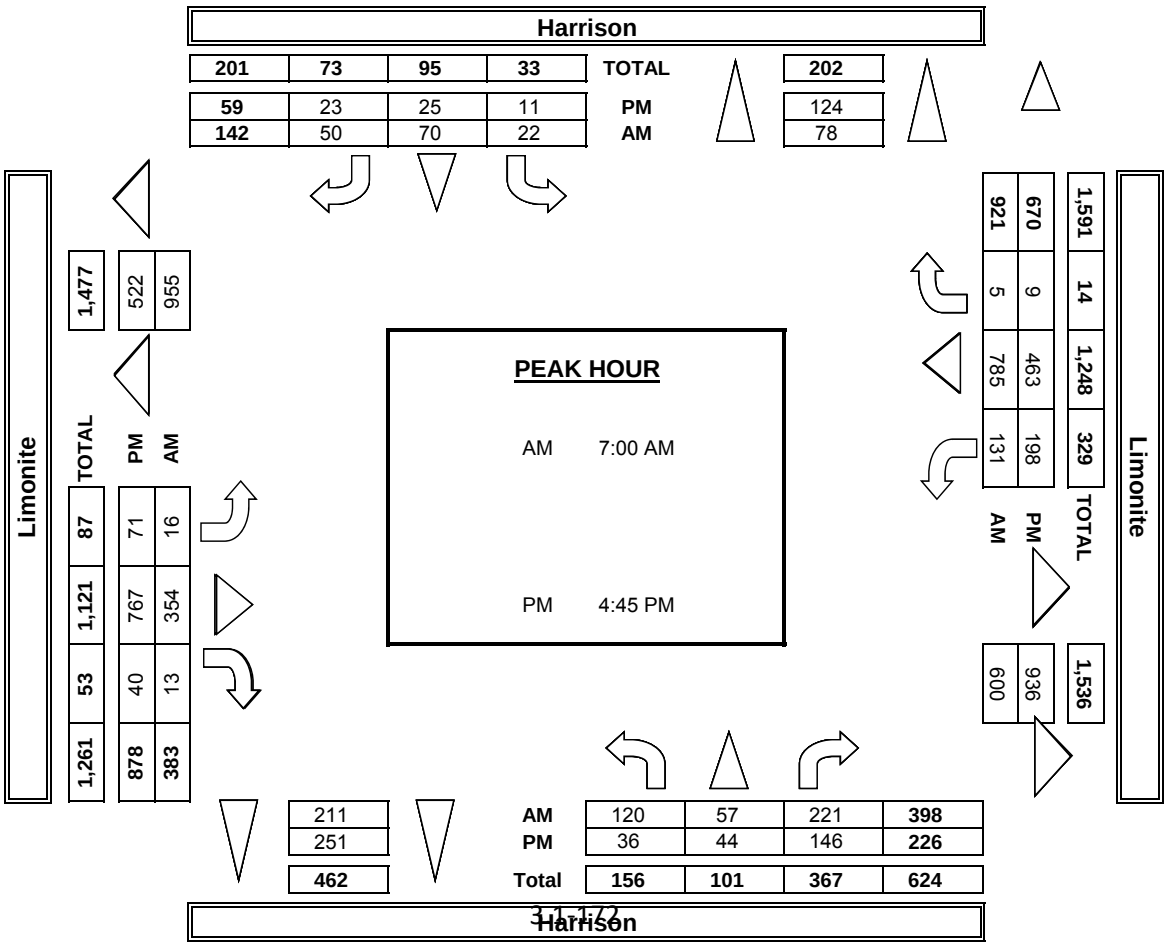
Harrison

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	1	1	0	1	3	1	0	0	0	1	0	1	0	1	2
	7:15 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	8:45 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	5	3	1	1	10	5	1	1	0	7	0	2	0	1	3
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	4:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	1	1	0	2	0	0	0	0	0	0	1	1	0	2
	5:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	5:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	5	1	1	0	7	2	0	0	0	2	3	1	1	0	5

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Harrison	LOCATION #:	37
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND Harrison			SOUTHBOUND Harrison			EASTBOUND Limonite			WESTBOUND Limonite			
	LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 0	EL 1	ET 3	ER 0	WL 1	WT 2	WR 1	TOTAL
AM	7:00 AM	0	0	0	0	0	0	1	2	1	1	11	0	16
	7:15 AM	1	0	0	0	1	0	0	6	0	2	10	0	20
	7:30 AM	2	1	1	0	0	0	0	4	0	1	4	0	13
	7:45 AM	0	1	1	0	3	0	0	8	0	2	6	0	21
	8:00 AM	0	0	2	0	0	0	2	2	1	2	5	0	14
	8:15 AM	0	0	1	0	0	2	1	4	0	0	5	1	14
	8:30 AM	0	1	0	0	1	1	1	6	1	1	5	0	17
	8:45 AM	0	0	0	0	1	1	0	7	0	1	12	0	22
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	3	3	5	0	6	4	5	39	3	10	58	1	137
	APPROACH %	27%	27%	45%	0%	60%	40%	11%	83%	6%	14%	84%	1%	
	APP/DEPART	11	/	9	10	/	19	47	/	44	69	/	65	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	3	2	2	0	4	0	1	20	1	6	31	0	70
	APPROACH %	43%	29%	29%	0%	100%	0%	5%	91%	5%	16%	84%	0%	
	PEAK HR FACTOR		0.438			0.333			0.688			0.771		0.833
	APP/DEPART	7	/	3	4	/	11	22	/	22	37	/	34	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	3	0	0	1	0	0	8	0	0	6	0	19
	4:15 PM	0	2	2	0	0	0	2	6	0	2	3	0	17
	4:30 PM	0	0	0	1	0	1	0	9	0	0	1	0	12
	4:45 PM	1	1	0	0	0	0	0	7	0	0	2	0	11
	5:00 PM	0	1	1	0	0	0	1	8	0	1	8	0	20
	5:15 PM	1	1	1	0	0	0	1	5	0	1	1	0	11
	5:30 PM	0	0	1	0	0	0	0	4	0	1	2	0	8
	5:45 PM	0	0	0	0	1	0	2	2	0	0	0	0	5
	VOLUMES	3	8	5	1	2	1	6	49	0	5	23	0	103
	APPROACH %	19%	50%	31%	25%	50%	25%	11%	89%	0%	18%	82%	0%	
	APP/DEPART	16	/	14	4	/	7	55	/	55	28	/	27	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	1	4	3	1	0	1	3	30	0	3	14	0	60
	APPROACH %	13%	50%	38%	50%	0%	50%	9%	91%	0%	18%	82%	0%	
	PEAK HR FACTOR		0.500			0.250			0.917			0.472		0.750
	APP/DEPART	8	/	7	2	/	3	33	/	34	17	/	16	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Harrison	LOCATION #:	37
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND Harrison			SOUTHBOUND Harrison			EASTBOUND Limonite			WESTBOUND Limonite			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 0	EL 1	ET 3	ER 0	WL 1	WT 2	WR 1	TOTAL
7:00 AM	0	0	0	0	1	0	0	2	0	0	3	0	6
7:15 AM	0	0	0	0	0	0	0	1	0	0	4	0	5
7:30 AM	0	0	1	0	1	0	0	3	0	0	1	0	6
7:45 AM	0	0	0	0	0	0	1	3	0	0	3	0	7
8:00 AM	0	0	0	0	0	0	0	0	0	1	4	0	5
8:15 AM	0	0	0	0	0	1	0	1	0	0	2	0	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	1	2	0	0	2	0	5
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	1	0	2	1	2	12	0	1	19	0	38
APPROACH %	0%	0%	100%	0%	67%	33%	14%	86%	0%	5%	95%	0%	
APP/DEPART	1	/	2	3	/	3	14	/	13	20	/	20	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	1	0	2	0	1	9	0	0	11	0	24
APPROACH %	0%	0%	100%	0%	100%	0%	10%	90%	0%	0%	100%	0%	
PEAK HR FACTOR		0.250			0.500			0.625			0.688		0.857
APP/DEPART	1	/	1	2	/	2	10	/	10	11	/	11	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
4:15 PM	0	0	1	0	0	0	0	1	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
4:45 PM	0	0	1	0	0	0	0	1	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	3	0	0	1	0	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	2	0	0	0	0	10	0	0	3	0	15
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	2	/	0	0	/	0	10	/	12	3	/	3	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	0	2	0	0	0	0	6	0	0	2	0	10
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.500			0.000			0.750			0.500		0.833
APP/DEPART	2	/	0	0	/	0	6	/	8	2	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Harrison

NORTH SIDE

Limonite WEST SIDE EAST SIDE **Limonite**

SOUTH SIDE

Harrison

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Harrison	LOCATION #:	37
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Harrison			SOUTHBOUND Harrison			EASTBOUND Limonite			WESTBOUND Limonite			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 0	EL 1	ET 3	ER 0	WL 1	WT 2	WR 1	TOTAL
7:00 AM	0	0	0	0	0	0	0	3	0	0	3	0	6
7:15 AM	0	0	0	0	0	0	0	1	0	0	6	0	7
7:30 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
7:45 AM	0	0	0	0	0	0	0	4	0	0	2	0	6
8:00 AM	0	0	0	0	0	0	0	3	0	0	1	0	4
8:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
8:30 AM	0	0	1	0	0	0	0	0	0	0	2	0	3
8:45 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	1	0	0	0	0	15	0	0	18	0	34
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	1	/	0	0	/	0	15	/	16	18	/	18	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	0	0	0	0	0	9	0	0	12	0	21
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.563			0.500		0.750
APP/DEPART	0	/	0	0	/	0	9	/	9	12	/	12	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
4:15 PM	0	0	0	0	0	0	0	1	0	1	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
4:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	1	0	5	0	1	4	0	11
APPROACH %	0%	0%	0%	0%	0%	100%	0%	100%	0%	20%	80%	0%	
APP/DEPART	0	/	0	1	/	1	5	/	5	5	/	5	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	0	0	0	0	0	1	0	4	0	0	2	0	7
APPROACH %	0%	0%	0%	0%	0%	100%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.250			0.500			0.250		0.875
APP/DEPART	0	/	0	1	/	0	4	/	4	2	/	3	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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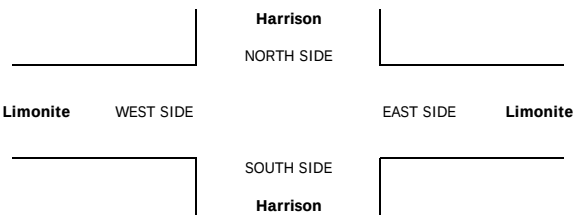
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Thu, Apr 21, 16

LOCATION: Ontario
NORTH & SOUTH: Sumner
EAST & WEST: Limonite

PROJECT #: SC0916
LOCATION #: 38
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ | ◄ W | E ► | S ▼

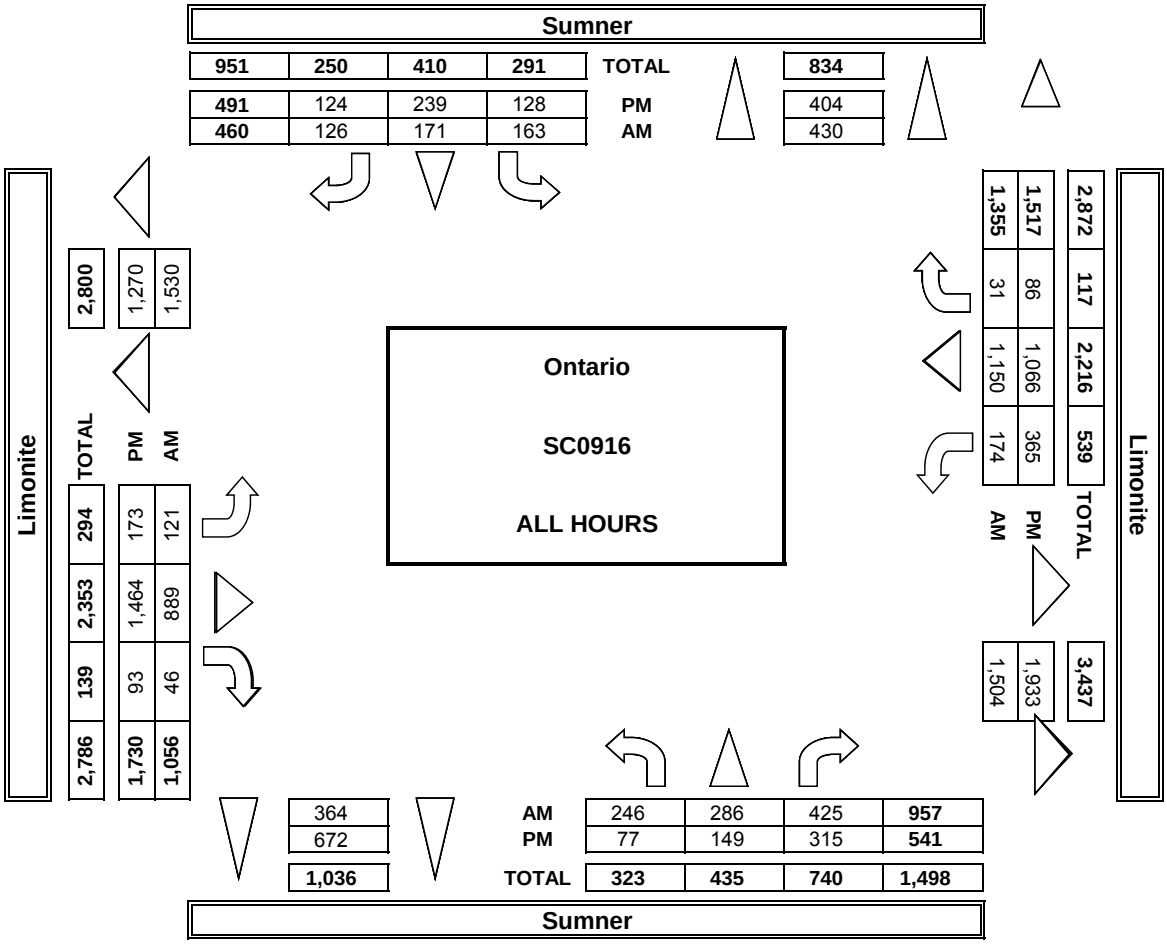
Add U-Turns to Left Turns

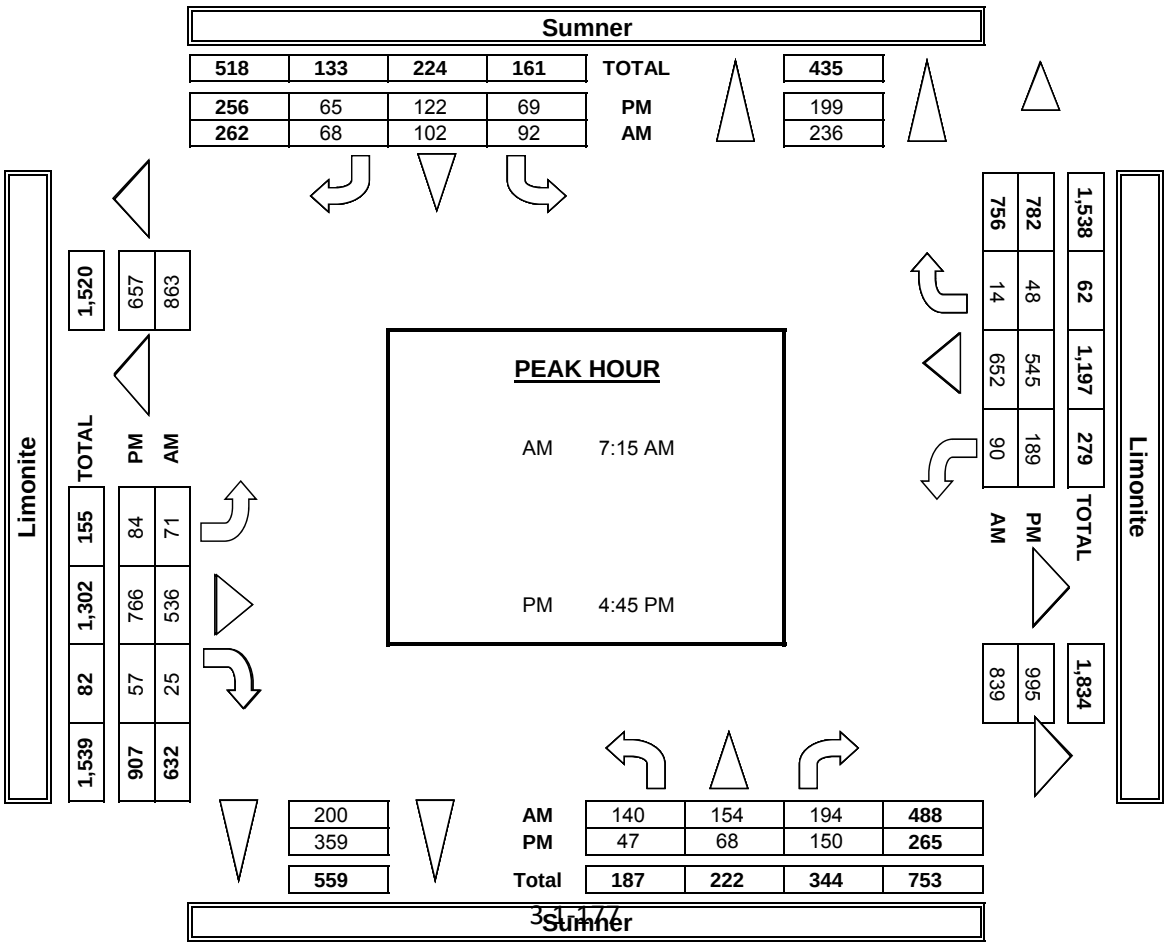
		NORTHBOUND (Sumner)			SOUTHBOUND (Sumner)			EASTBOUND (Limonite)			WESTBOUND (Limonite)				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 2	ET 3	ER 0	WL 2	WT 3	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	25	40	39	19	38	19	11	96	4	19	150	5	465	0	0	0	1	1	13	7	1	2
	7:15 AM	27	34	43	14	52	11	19	147	6	27	188	5	573	0	0	0	5	5	16	6	2	3
	7:30 AM	51	49	48	18	17	19	14	143	7	18	171	1	556	0	0	0	2	2	18	6	2	0
	7:45 AM	34	44	52	26	18	20	17	131	5	21	132	1	501	0	0	2	6	8	15	5	1	0
	8:00 AM	28	27	51	34	15	18	21	115	7	24	161	7	508	0	0	1	4	5	20	8	2	3
	8:15 AM	35	40	70	23	18	16	27	90	7	25	110	7	468	0	0	4	4	8	18	11	2	4
	8:30 AM	25	32	77	14	7	14	7	92	6	23	136	4	437	0	0	1	2	3	31	9	0	2
	8:45 AM	21	20	45	15	6	9	5	75	4	17	102	1	320	0	0	0	3	3	25	6	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	246	286	425	163	171	126	121	889	46	174	1,150	31	3,828	0	0	8	27	35	156	58	10	14
	APPROACH %	26%	30%	44%	35%	37%	27%	11%	84%	4%	13%	85%	2%										
	APP/DEPART	957	/	430	460	/	364	1,056	/	1,504	1,355	/	1,530	0									
	BEGIN PEAK HR		7:15 AM																				
	VOLUMES	140	154	194	92	102	68	71	536	25	90	652	14	2,138						69	25	7	6
	APPROACH %	29%	32%	40%	35%	39%	26%	11%	85%	4%	12%	86%	2%										
	PEAK HR FACTOR		0.824			0.851			0.919			0.859		0.933									
	APP/DEPART	488	/	236	262	/	200	632	/	839	756	/	863	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	10	27	56	16	22	14	26	143	4	49	121	10	498	0	0	1	6	7	23	11	1	5
	4:15 PM	1	28	45	20	23	21	19	212	8	35	132	8	552	0	0	1	4	5	13	9	0	4
	4:30 PM	12	13	37	12	25	15	20	176	11	38	120	10	489	0	0	0	1	1	18	9	0	8
	4:45 PM	13	16	43	20	31	11	19	191	12	52	130	10	548	0	0	0	3	3	18	5	1	4
	5:00 PM	9	15	31	17	21	21	22	174	18	51	139	13	531	0	0	0	3	3	19	10	3	0
	5:15 PM	14	20	35	16	34	19	21	206	13	48	124	13	563	0	0	1	3	4	18	8	1	8
	5:30 PM	11	17	41	16	36	14	22	195	14	38	152	12	568	1	0	0	1	2	17	3	1	8
	5:45 PM	7	13	27	11	47	9	24	167	13	54	148	10	530	0	0	1	5	6	13	3	2	6
	VOLUMES	77	149	315	128	239	124	173	1,464	93	365	1,066	86	4,279	1	0	4	26	31	139	58	9	43
	APPROACH %	14%	28%	58%	26%	49%	25%	10%	85%	5%	24%	70%	6%										
	APP/DEPART	541	/	404	491	/	672	1,730	/	1,933	1,517	/	1,270	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	47	68	150	69	122	65	84	766	57	189	545	48	2,210						72	26	6	20
	APPROACH %	18%	26%	57%	27%	48%	25%	9%	84%	6%	24%	70%	6%										
	PEAK HR FACTOR		0.920			0.928			0.945			0.963		0.973									
	APP/DEPART	265	/	199	256	/	359	907	/	995	782	/	657	0									

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	6	0	0	6	0	0	0	0	0	0	6	0	0	6
	7:15 AM	2	0	0	0	2	0	0	0	0	0	2	0	0	0	2
	7:30 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	7:45 AM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	4	8	1	0	13	2	0	1	0	3	2	8	0	0	10
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	2	1	1	0	4	0	1	1	0	2	2	0	0	0	2
	4:45 PM	0	2	2	0	4	0	2	2	0	4	0	0	0	0	0
	5:00 PM	1	2	0	1	4	1	0	0	1	2	0	2	0	0	2
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	5:45 PM	0	0	1	1	2	0	0	1	1	2	0	0	0	0	0
	TOTAL	5	5	4	2	16	3	3	4	2	12	2	2	0	0	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Sumner	LOCATION #:	38
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND (Sumner)			SOUTHBOUND (Sumner)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 2	ET 3	ER 0	WL 2	WT 3	WR 1	TOTAL
AM	7:00 AM	0	0	0	1	0	3	1	6	0	0	7	0	18
	7:15 AM	0	0	0	2	0	1	0	4	0	1	9	0	17
	7:30 AM	1	0	0	1	0	0	0	7	0	1	6	0	16
	7:45 AM	0	2	2	0	1	1	0	5	0	0	5	1	17
	8:00 AM	0	0	1	0	0	2	1	6	0	1	9	0	20
	8:15 AM	0	0	1	1	1	1	0	6	2	1	6	1	20
	8:30 AM	0	1	0	0	0	0	0	3	1	3	6	0	14
	8:45 AM	2	0	0	1	0	0	0	7	0	2	4	0	16
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	3	3	4	6	2	8	2	44	3	9	52	2	138
	APPROACH %	30%	30%	40%	38%	13%	50%	4%	90%	6%	14%	83%	3%	
	APP/DEPART	10	/	7	16	/	14	49	/	54	63	/	63	0
	BEGIN PEAK HR		7:30 AM											
	VOLUMES	1	2	4	2	2	4	1	24	2	3	26	2	73
	APPROACH %	14%	29%	57%	25%	25%	50%	4%	89%	7%	10%	84%	6%	
	PEAK HR FACTOR		0.438			0.667			0.844			0.775		0.913
	APP/DEPART	7	/	5	8	/	7	27	/	30	31	/	31	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	2	3	0	0	0	1	8	0	0	2	0	17
	4:15 PM	0	1	2	0	1	1	0	7	0	0	2	0	14
	4:30 PM	1	1	1	0	1	1	0	10	0	1	1	1	18
	4:45 PM	0	1	0	1	0	0	2	8	0	1	3	0	16
	5:00 PM	1	0	0	0	0	0	1	4	0	0	6	1	13
	5:15 PM	1	0	1	1	0	0	1	7	0	0	2	0	13
	5:30 PM	0	1	0	0	1	0	0	6	0	0	3	0	11
	5:45 PM	0	0	0	0	0	0	3	3	0	2	1	0	9
	VOLUMES	4	6	7	2	3	2	8	53	0	4	20	2	111
	APPROACH %	24%	35%	41%	29%	43%	29%	13%	87%	0%	15%	77%	8%	
	APP/DEPART	17	/	16	7	/	7	61	/	62	26	/	26	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	2	5	6	1	2	2	3	33	0	2	8	1	65
	APPROACH %	15%	38%	46%	20%	40%	40%	8%	92%	0%	18%	73%	9%	
	PEAK HR FACTOR		0.542			0.625			0.900			0.688		0.903
	APP/DEPART	13	/	9	5	/	4	36	/	40	11	/	12	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Sumner	LOCATION #:	38
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Sumner)			SOUTHBOUND (Sumner)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 2	ET 3	ER 0	WL 2	WT 3	WR 1	TOTAL
7:00 AM	0	0	0	0	0	0	0	1	0	0	3	1	5
7:15 AM	0	0	0	0	0	0	0	1	0	1	2	0	4
7:30 AM	0	0	0	0	0	0	0	5	0	0	0	0	5
7:45 AM	0	0	0	0	0	1	2	1	0	0	2	0	6
8:00 AM	0	1	1	0	0	0	0	1	0	0	1	0	4
8:15 AM	0	0	0	0	0	0	0	0	0	0	4	1	5
8:30 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
8:45 AM	0	0	0	0	0	0	0	2	0	0	3	0	5
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	1	1	0	0	1	2	12	0	1	16	2	36
APPROACH %	0%	50%	50%	0%	0%	100%	14%	86%	0%	5%	84%	11%	
APP/DEPART	2	/	5	1	/	1	14	/	13	19	/	17	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	1	1	0	0	1	2	7	0	0	7	1	20
APPROACH %	0%	50%	50%	0%	0%	100%	22%	78%	0%	0%	88%	13%	
PEAK HR FACTOR		0.250			0.250			0.450			0.400		0.833
APP/DEPART	2	/	4	1	/	0	9	/	8	8	/	8	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	3	0	0	1	0	4
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	0	0	2	0	0	0	1	4
5:30 PM	0	0	0	0	1	0	0	3	0	0	1	0	5
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	1	0	1	0	0	12	0	0	3	1	18
APPROACH %	0%	0%	100%	0%	100%	0%	0%	100%	0%	0%	75%	25%	
APP/DEPART	1	/	1	1	/	1	12	/	13	4	/	3	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	0	0	1	0	1	0	0	6	0	0	1	1	10
APPROACH %	0%	0%	100%	0%	100%	0%	0%	100%	0%	0%	50%	50%	
PEAK HR FACTOR		0.250			0.250			0.500			0.500		0.500
APP/DEPART	1	/	1	1	/	1	6	/	7	2	/	1	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Sumner	LOCATION #:	38
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

		NORTHBOUND (Sumner)			SOUTHBOUND (Sumner)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 2	ET 3	ER 0	WL 2	WT 3	WR 1	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	2	0	0	3	0	5
	7:15 AM	0	0	0	0	0	0	0	1	0	0	4	0	5
	7:30 AM	0	0	0	0	0	0	0	4	0	0	2	0	6
	7:45 AM	0	0	0	0	0	0	0	4	0	0	3	0	7
	8:00 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
	8:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
	8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
	8:45 AM	0	0	0	0	0	0	0	2	0	0	2	0	4
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	15	0	0	18	0	33
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	APP/DEPART	0	/	0	0	/	0	15	/	15	18	/	18	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	0	0	0	0	0	0	11	0	0	12	0	23
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.000			0.688			0.750		0.821
	APP/DEPART	0	/	0	0	/	0	11	/	11	12	/	12	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
	4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
	4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
	4:45 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
	5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
	5:15 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	0	0	0	0	5	0	0	6	0	11
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	APP/DEPART	0	/	0	0	/	0	5	/	5	6	/	6	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	0	0	0	0	0	0	0	4	0	0	5	0	9
	APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
	PEAK HR FACTOR		0.000			0.000			0.500			0.625		0.563
	APP/DEPART	0	/	0	0	/	0	4	/	4	5	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
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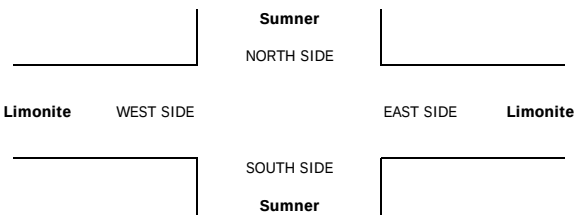
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Thu, Apr 21, 16

LOCATION: Ontario
NORTH & SOUTH: Scholar
EAST & WEST: Limonite

PROJECT #: SC0916
LOCATION #: 39
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND (Scholar)			SOUTHBOUND (Scholar)			EASTBOUND (Limonite)			WESTBOUND (Limonite)				U-TURNS					RTOR			
	LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	9	11	28	7	16	8	5	119	2	18	137	6	366	0	0	0	0	0	4	1	1	1
	7:15 AM	19	23	43	11	38	13	8	213	12	17	170	6	573	0	0	1	0	1	8	0	3	0
	7:30 AM	22	22	36	8	21	7	11	186	5	14	134	3	469	0	0	0	1	1	7	0	1	0
	7:45 AM	17	32	49	4	35	10	2	213	15	6	144	3	530	0	0	0	0	0	13	1	1	0
	8:00 AM	32	31	31	4	47	11	4	173	33	25	146	2	539	0	0	0	0	0	9	1	3	0
	8:15 AM	22	37	38	7	27	8	6	190	15	19	110	2	481	0	0	1	1	2	11	0	0	0
	8:30 AM	14	17	33	11	13	8	2	180	2	21	137	8	446	0	0	0	0	0	10	0	0	0
	8:45 AM	10	5	26	8	3	3	2	167	2	21	115	3	365	0	0	1	1	2	12	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	145	178	284	60	200	68	40	1,441	86	141	1,093	33	3,769	0	0	3	3	6	74	3	9	1
	APPROACH %	24%	29%	47%	18%	61%	21%	3%	92%	5%	11%	86%	3%										
	APP/DEPART	607	/	248	328	/	424	1,567	/	1,788	1,267	/	1,309	0									
	BEGIN PEAK HR		7:15 AM																				
	VOLUMES	90	108	159	27	141	41	25	785	65	62	594	14	2,111						37	2	8	0
	APPROACH %	25%	30%	45%	13%	67%	20%	3%	90%	7%	9%	89%	2%										
	PEAK HR FACTOR		0.911			0.843			0.939			0.868		0.921									
	APP/DEPART	357	/	146	209	/	267	875	/	972	670	/	726	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	15	34	41	8	24	3	10	213	12	30	152	9	551	0	0	0	0	0	6	1	0	1
	4:15 PM	10	12	43	6	19	5	8	247	5	29	157	3	544	0	0	2	0	2	6	1	0	1
	4:30 PM	13	8	27	6	11	6	3	227	6	42	153	8	510	0	0	0	0	0	7	1	0	0
	4:45 PM	10	4	31	9	10	8	6	221	8	29	173	3	512	0	0	0	0	0	11	3	0	0
	5:00 PM	8	3	34	6	18	3	6	238	6	34	180	8	544	0	0	1	0	1	11	1	1	0
	5:15 PM	8	8	29	5	8	4	8	234	17	37	206	9	573	0	0	0	0	0	10	0	1	0
	5:30 PM	5	5	35	5	21	3	15	226	10	50	185	6	566	0	0	1	1	2	15	2	0	0
	5:45 PM	11	8	36	8	23	4	10	213	13	37	201	11	575	0	0	1	1	2	11	0	0	0
	VOLUMES	80	82	276	53	134	36	66	1,819	77	288	1,407	57	4,375	0	0	5	2	7	77	9	2	2
	APPROACH %	18%	19%	63%	24%	60%	16%	3%	93%	4%	16%	80%	3%										
	APP/DEPART	438	/	200	223	/	497	1,962	/	2,150	1,752	/	1,528	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	32	24	134	24	70	14	39	911	46	158	772	34	2,258						47	3	2	0
	APPROACH %	17%	13%	71%	22%	65%	13%	4%	91%	5%	16%	80%	4%										
	PEAK HR FACTOR		0.864			0.771			0.961			0.956		0.982									
	APP/DEPART	190	/	94	108	/	272	996	/	1,071	964	/	821	0									

Scholar

NORTH SIDE

Limonite WEST SIDE EAST SIDE **Limonite**

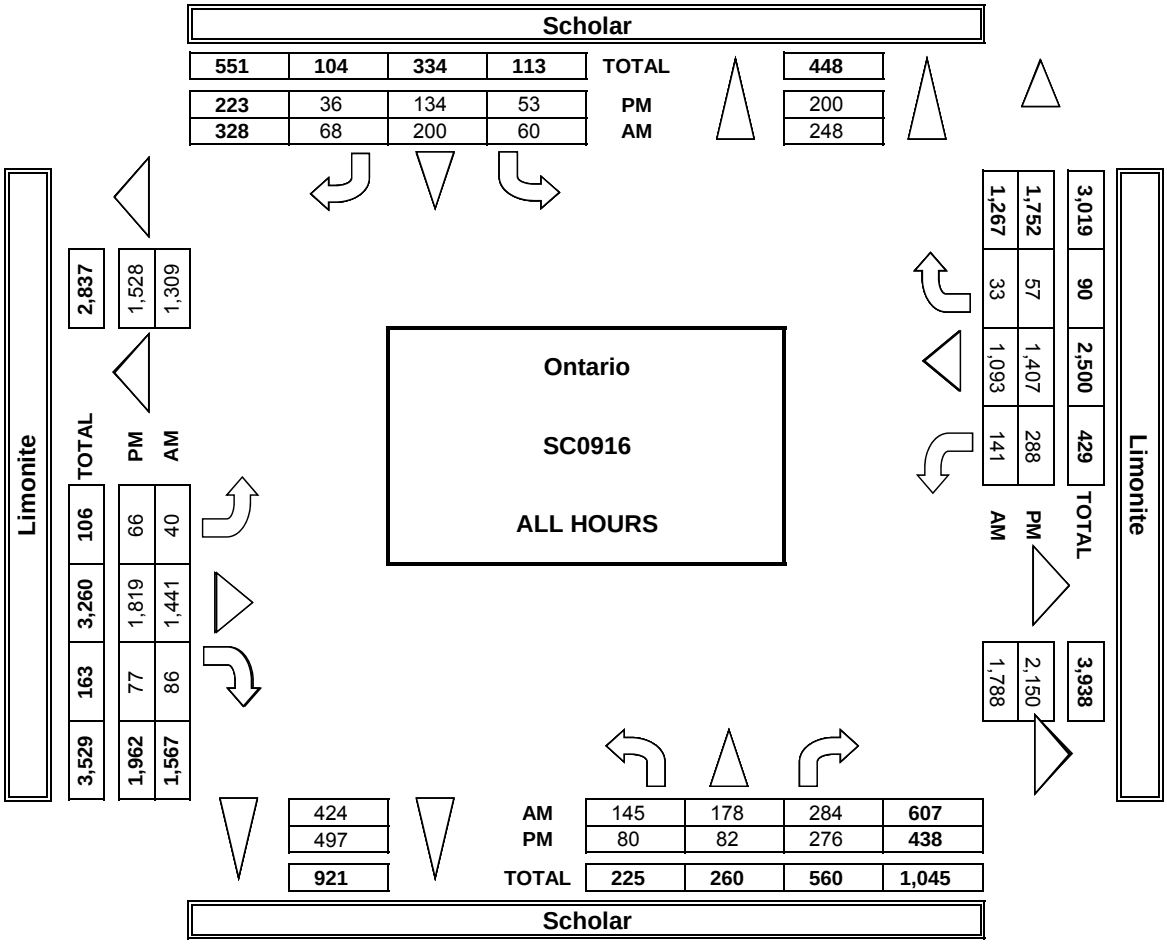
SOUTH SIDE

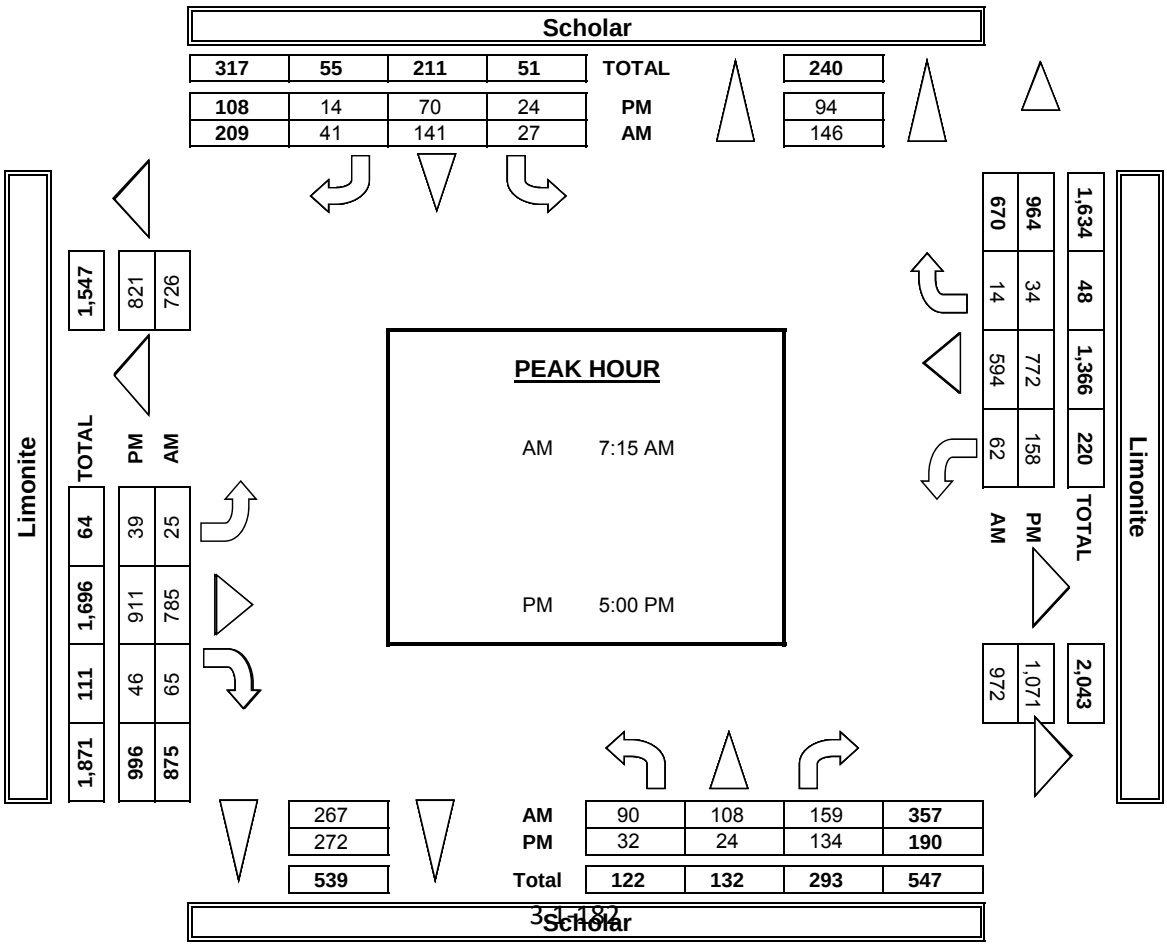
Scholar

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	9	0	0	9	0	4	0	0	4	0	5	0	0	5
	7:15 AM	1	10	0	0	11	1	1	0	0	2	0	9	0	0	9
	7:30 AM	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4
	7:45 AM	0	7	0	0	7	0	4	0	0	4	0	3	0	0	3
	8:00 AM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2
	8:15 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
	8:30 AM	0	2	2	0	4	0	0	1	0	1	0	2	1	0	3
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	1	36	2	0	39	1	10	1	0	12	0	26	1	0	27
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	4	1	0	5	0	1	0	0	1	0	3	1	0	4
	4:15 PM	0	3	0	0	3	0	1	0	0	1	0	2	0	0	2
	4:30 PM	0	1	0	2	3	0	1	0	2	3	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	5:00 PM	1	1	3	2	7	1	1	2	2	6	0	0	1	0	1
	5:15 PM	0	1	0	1	2	0	0	0	0	0	0	1	0	1	2
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	1	1	2	0	0	1	1	2	0	0	0	0	0
	TOTAL	1	10	6	6	23	1	4	3	5	13	0	6	3	1	10

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Scholar	LOCATION #:	39
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Scholar)			SOUTHBOUND (Scholar)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
	LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL
AM	7:00 AM	0	1	0	1	0	0	0	6	0	0	7	0	15
	7:15 AM	1	0	1	0	0	0	1	9	0	0	9	1	22
	7:30 AM	0	0	1	0	0	0	0	4	2	1	6	0	14
	7:45 AM	0	1	1	0	0	1	1	5	0	0	7	1	17
	8:00 AM	0	0	0	0	0	0	0	8	0	2	8	0	18
	8:15 AM	0	0	1	0	2	0	1	9	0	0	7	0	20
	8:30 AM	0	0	1	0	1	1	0	8	0	2	6	1	20
	8:45 AM	0	0	1	0	0	0	0	9	0	0	8	0	18
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1	2	6	1	3	2	3	58	2	5	58	3	144
	APPROACH %	11%	22%	67%	17%	50%	33%	5%	92%	3%	8%	88%	5%	
	APP/DEPART	9	/	7	6	/	10	63	/	65	66	/	62	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	0	0	3	0	3	1	0	34	0	4	29	1	76
	APPROACH %	0%	0%	100%	0%	75%	25%	0%	97%	0%	12%	85%	3%	
	PEAK HR FACTOR		0.750			0.500			0.875			0.850		0.950
	APP/DEPART	3	/	1	4	/	7	35	/	37	34	/	31	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	1	10	0	2	2	0	15
	4:15 PM	0	0	1	1	0	1	2	10	0	0	3	0	18
	4:30 PM	0	1	0	2	0	0	0	10	0	1	2	1	17
	4:45 PM	0	0	3	0	0	0	1	7	0	0	5	1	17
	5:00 PM	0	0	0	0	2	1	0	8	0	4	6	0	21
	5:15 PM	1	0	1	0	0	0	0	8	0	0	2	0	12
	5:30 PM	0	0	1	0	0	0	0	7	0	0	4	0	12
	5:45 PM	0	0	2	0	0	0	0	3	0	0	3	0	8
	VOLUMES	1	1	8	3	2	2	4	63	0	7	27	2	120
	APPROACH %	10%	10%	80%	43%	29%	29%	6%	94%	0%	19%	75%	6%	
	APP/DEPART	10	/	6	7	/	9	67	/	74	36	/	31	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	0	1	4	3	2	2	2	35	0	5	16	2	73
	APPROACH %	0%	20%	80%	43%	29%	29%	5%	92%	0%	22%	70%	9%	
	PEAK HR FACTOR		0.417			0.583			0.792			0.575		0.869
	APP/DEPART	5	/	5	7	/	7	38	/	42	23	/	19	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
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0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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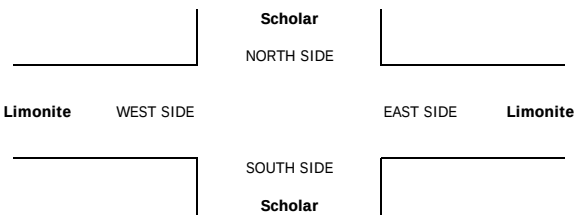
0	0	0	0
0	0	0	0
0	0	0	0
2	0	0	0
2	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Scholar	LOCATION #:	39
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND (Scholar)			SOUTHBOUND (Scholar)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL
7:00 AM	0	0	0	0	0	0	0	1	0	1	3	0	5
7:15 AM	0	0	0	0	0	1	0	2	0	1	2	0	6
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	2	0	0	4	1	7
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	1	3	2	6
8:45 AM	0	0	0	0	0	0	0	2	0	0	3	0	5
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	1	0	11	0	3	16	3	34
APPROACH %	0%	0%	0%	0%	0%	100%	0%	100%	0%	14%	73%	14%	
APP/DEPART	0	/	3	1	/	3	11	/	11	22	/	17	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	0	0	0	1	0	6	0	2	9	1	19
APPROACH %	0%	0%	0%	0%	0%	100%	0%	100%	0%	17%	75%	8%	
PEAK HR FACTOR		0.000			0.250			0.750			0.600		0.679
APP/DEPART	0	/	1	1	/	2	6	/	6	12	/	10	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	2	0	0	0	0	2	0	0	0	0	4
4:15 PM	0	1	0	0	0	0	0	2	0	0	1	0	4
4:30 PM	1	0	1	0	0	0	0	3	0	0	0	0	5
4:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
VOLUMES	2	1	3	1	0	0	0	13	0	0	1	0	21
APPROACH %	33%	17%	50%	100%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	6	/	1	1	/	0	13	/	17	1	/	3	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	1	3	0	0	0	0	10	0	0	1	0	16
APPROACH %	20%	20%	60%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.625			0.000			0.833			0.250		0.800
APP/DEPART	5	/	1	0	/	0	10	/	13	1	/	2	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

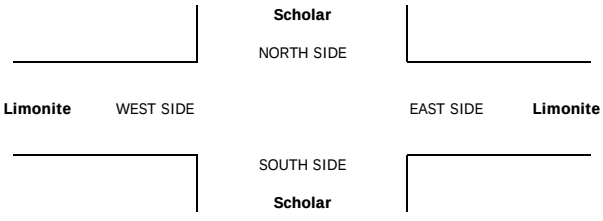
RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

0	0	0	0

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Scholar	LOCATION #:	39
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND (Scholar)			SOUTHBOUND (Scholar)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL
7:00 AM	0	0	0	0	0	0	0	3	0	0	3	0	6
7:15 AM	0	0	0	1	0	0	0	2	0	0	5	0	8
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
7:45 AM	0	0	0	0	0	0	0	4	0	0	2	0	6
8:00 AM	1	0	0	0	0	0	0	5	0	0	1	0	7
8:15 AM	0	0	0	0	0	0	0	1	0	0	4	0	5
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	1	0	0	2	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	0	0	1	0	0	0	17	0	0	18	0	37
APPROACH %	100%	0%	0%	100%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	1	/	0	1	/	0	17	/	18	18	/	19	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	1	0	0	1	0	0	0	11	0	0	9	0	22
APPROACH %	100%	0%	0%	100%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.250			0.250			0.550			0.450		0.688
APP/DEPART	1	/	0	1	/	0	11	/	12	9	/	10	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
5:15 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
VOLUMES	0	0	0	0	0	0	0	4	0	0	7	0	11
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	0	/	0	0	/	0	4	/	4	7	/	7	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	0	0	0	0	0	0	0	3	0	0	5	0	8
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.375			0.625		0.667
APP/DEPART	0	/	0	0	/	0	3	/	3	5	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Thu, Apr 21, 16

LOCATION: Ontario
NORTH & SOUTH: Hamner
EAST & WEST: Limonite

PROJECT #: SC0916
LOCATION #: 40
CONTROL: SIGNAL

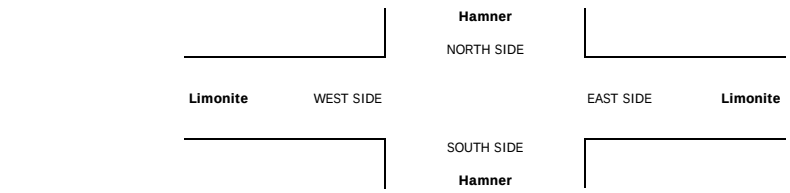
NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

Add U-Turns to Left Turns

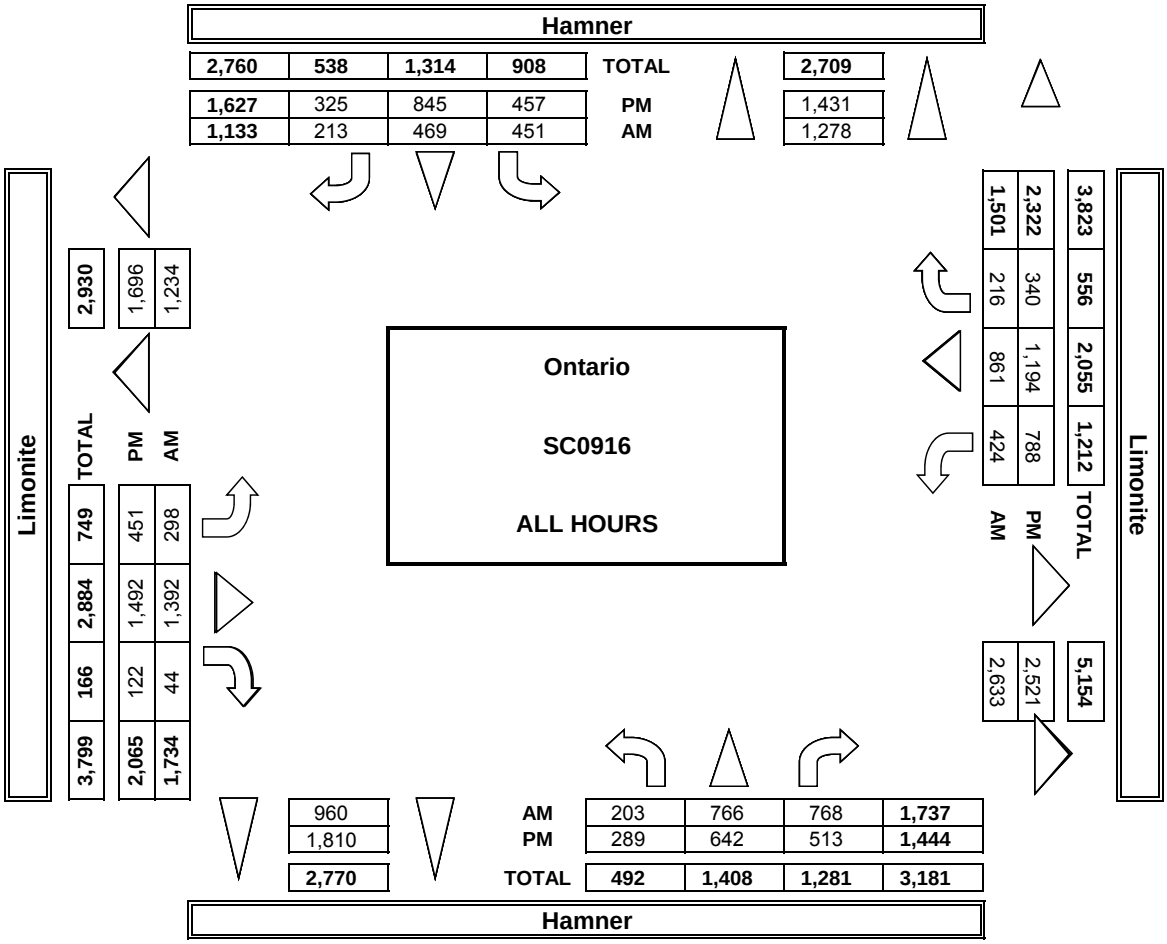
		NORTHBOUND (Hamner)			SOUTHBOUND (Hamner)			EASTBOUND (Limonite)			WESTBOUND (Limonite)				U-TURNS					RTOR			
	LANES:	NL 2	NT 3	NR 1	SL 2	ST 2	SR 1	EL 2	ET 3	ER 1	WL 2	WT 2	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	16	74	98	55	49	18	22	171	0	69	166	17	755	1	1	0	1	3	30	8	0	5
	7:15 AM	25	88	99	60	74	23	28	203	9	56	116	26	807	2	0	2	3	7	29	13	2	8
	7:30 AM	31	126	102	61	54	28	37	197	7	48	101	25	817	8	0	0	2	10	35	13	0	12
	7:45 AM	32	127	108	54	61	24	42	178	5	47	86	31	795	6	0	0	5	11	25	10	1	15
	8:00 AM	28	104	97	64	51	36	36	168	7	54	100	18	763	9	0	0	3	12	25	15	3	2
	8:15 AM	25	99	102	54	80	26	37	177	4	40	94	31	769	11	0	0	2	13	25	16	2	6
	8:30 AM	29	80	97	56	50	36	54	167	6	56	104	37	772	5	0	1	1	7	32	18	2	11
	8:45 AM	17	68	65	47	50	22	42	131	6	54	94	31	627	4	0	0	6	10	15	12	4	18
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	203	766	768	451	469	213	298	1,392	44	424	861	216	6,105	46	1	3	23	73	216	105	14	77
	APPROACH %	12%	44%	44%	40%	41%	19%	17%	80%	3%	28%	57%	14%										
	APP/DEPART	1,737	/	1,278	1,133	/	960	1,734	/	2,633	1,501	/	1,234	0									
	BEGIN PEAK HR		7:15 AM																				
	VOLUMES	116	445	406	239	240	111	143	746	28	205	403	100	3,182						114	51	6	37
	APPROACH %	12%	46%	42%	41%	41%	19%	16%	81%	3%	29%	57%	14%										
	PEAK HR FACTOR		0.905			0.939			0.951			0.894		0.974									
	APP/DEPART	967	/	686	590	/	485	917	/	1,404	708	/	607	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	31	78	65	44	95	32	58	174	13	85	130	36	841	16	0	0	6	22	23	7	3	11
	4:15 PM	30	83	61	69	111	47	59	208	14	87	126	48	943	10	0	0	7	17	24	11	7	19
	4:30 PM	39	81	79	62	103	38	57	194	15	93	124	39	924	19	0	1	6	26	25	7	7	12
	4:45 PM	34	85	70	65	111	36	60	171	16	103	154	45	950	10	0	0	11	21	20	8	4	20
	5:00 PM	34	66	50	54	94	49	46	207	20	90	178	55	943	15	0	0	9	24	14	11	8	16
	5:15 PM	32	96	70	48	127	36	57	168	8	103	158	40	943	7	0	1	7	15	21	9	2	16
	5:30 PM	38	74	57	49	88	37	46	217	16	124	176	45	967	17	1	0	7	25	20	12	5	16
	5:45 PM	51	79	61	66	116	50	68	153	20	103	148	32	947	21	0	1	7	29	20	11	12	14
	VOLUMES	289	642	513	457	845	325	451	1,492	122	788	1,194	340	7,458	115	1	3	60	179	167	76	48	124
	APPROACH %	20%	44%	36%	28%	52%	20%	22%	72%	6%	34%	51%	15%										
	APP/DEPART	1,444	/	1,431	1,627	/	1,810	2,065	/	2,521	2,322	/	1,696	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	138	321	247	216	420	158	209	763	60	420	666	185	3,803						75	40	19	68
	APPROACH %	20%	45%	35%	27%	53%	20%	20%	74%	6%	33%	52%	15%										
	PEAK HR FACTOR		0.891			0.936			0.925			0.921		0.983									
	APP/DEPART	706	/	715	794	/	915	1,032	/	1,259	1,271	/	914	0									

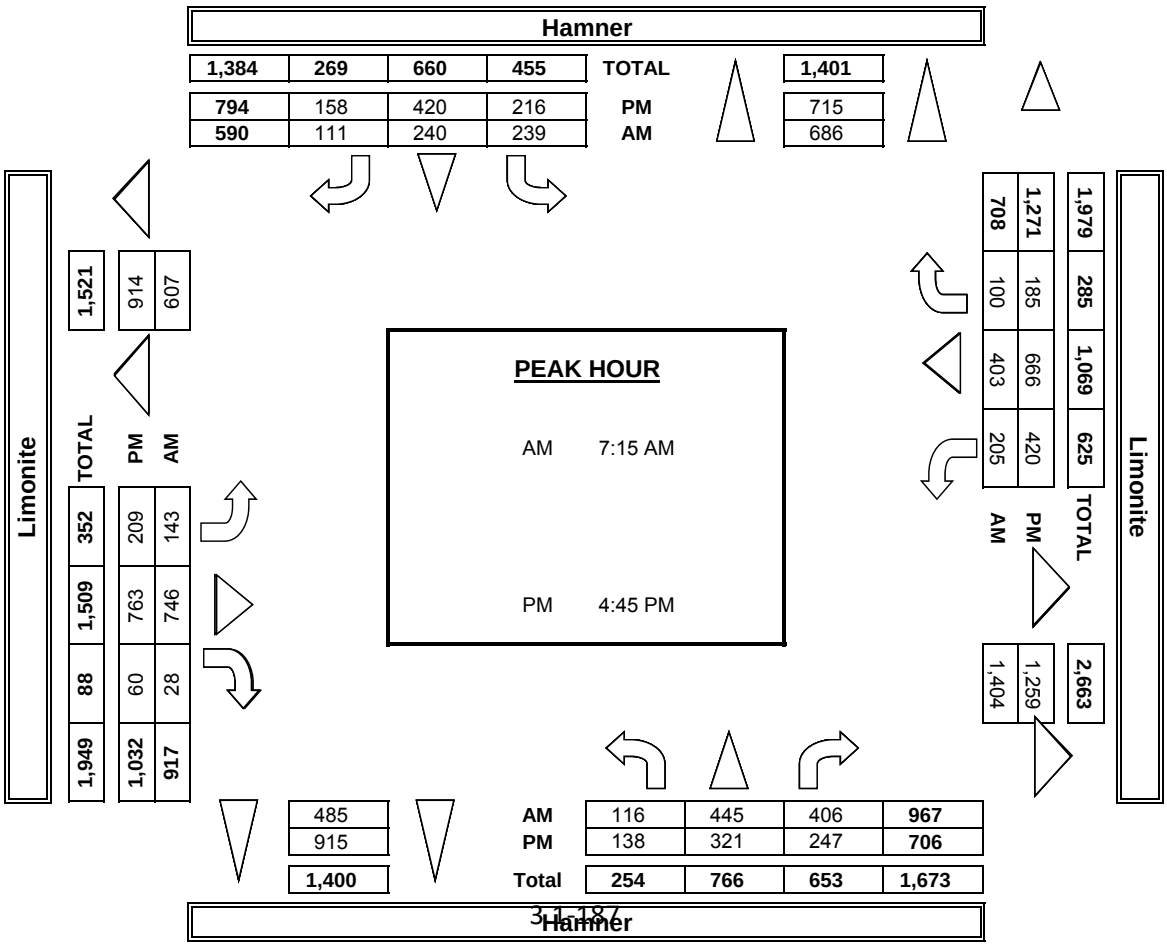


	ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	7:15 AM	0	3	0	3	6	0	3	0	3	6	0	0	0	0	0
	7:30 AM	1	0	2	0	3	1	0	2	0	3	0	0	0	0	0
	7:45 AM	3	0	0	0	3	3	0	0	0	3	0	0	0	0	0
	8:00 AM	2	0	0	0	2	1	0	0	0	1	1	0	0	0	1
	8:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	8:30 AM	1	0	1	0	2	0	0	1	0	1	1	0	0	0	1
	8:45 AM	7	0	2	0	9	7	0	2	0	9	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	15	3	5	4	27	12	3	5	4	24	3	0	0	0	3
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	11	0	0	0	11	11	0	0	0	11	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	5	1	0	1	7	5	1	0	1	7	0	0	0	0	0
	4:45 PM	3	1	0	0	4	2	1	0	0	3	1	0	0	0	1
	5:00 PM	5	0	6	1	12	4	0	6	1	11	1	0	0	0	1
	5:15 PM	3	0	3	0	6	3	0	3	0	6	0	0	0	0	0
	5:30 PM	2	1	3	2	8	1	1	1	2	5	1	0	2	0	3
	5:45 PM	4	1	0	1	6	4	0	0	0	4	0	1	0	1	2
	TOTAL	33	4	12	5	54	30	3	10	4	47	3	1	2	1	7

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Hamner	LOCATION #:	40
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (Hamner)			SOUTHBOUND (Hamner)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
	LANES:	NL 2	NT 3	NR 1	SL 2	ST 2	SR 1	EL 2	ET 3	ER 1	WL 2	WT 2	WR 1	TOTAL
AM	7:00 AM	1	2	1	4	2	1	2	9	0	2	13	1	38
	7:15 AM	0	0	1	0	0	1	3	7	0	4	9	0	25
	7:30 AM	0	2	1	2	2	1	1	8	0	2	10	0	29
	7:45 AM	0	3	2	0	1	2	2	6	0	1	9	2	28
	8:00 AM	0	1	3	4	2	2	2	6	0	3	9	1	33
	8:15 AM	1	5	0	2	4	0	1	9	2	2	11	1	38
	8:30 AM	3	1	1	1	5	3	2	4	0	3	8	1	32
	8:45 AM	1	3	4	1	6	3	4	7	0	3	9	2	43
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	6	17	13	14	22	13	17	56	2	20	78	8	266
	APPROACH %	17%	47%	36%	29%	45%	27%	23%	75%	3%	19%	74%	8%	
	APP/DEPART	36	/	42	49	/	44	75	/	83	106	/	97	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	5	10	8	8	17	8	9	26	2	11	37	5	146
	APPROACH %	22%	43%	35%	24%	52%	24%	24%	70%	5%	21%	70%	9%	
	PEAK HR FACTOR		0.719			0.825			0.771			0.946		0.849
	APP/DEPART	23	/	24	33	/	30	37	/	42	53	/	50	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	2	1	2	1	1	4	12	0	1	5	0	30
	4:15 PM	0	5	0	1	0	1	1	9	0	1	6	1	25
	4:30 PM	0	1	1	2	2	0	1	8	0	0	7	1	23
	4:45 PM	1	1	0	1	1	1	0	9	0	2	5	1	22
	5:00 PM	1	1	0	2	1	1	2	7	0	2	6	2	25
	5:15 PM	0	1	3	0	0	0	2	6	0	1	5	0	18
	5:30 PM	1	2	1	1	3	0	2	8	0	3	4	1	26
	5:45 PM	0	0	2	1	2	1	0	11	0	0	1	0	18
	VOLUMES	4	13	8	10	10	5	12	70	0	10	39	6	187
	APPROACH %	16%	52%	32%	40%	40%	20%	15%	85%	0%	18%	71%	11%	
	APP/DEPART	25	/	31	25	/	20	82	/	88	55	/	48	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	2	9	2	6	4	3	6	38	0	4	23	3	100
	APPROACH %	15%	69%	15%	46%	31%	23%	14%	86%	0%	13%	77%	10%	
	PEAK HR FACTOR		0.650			0.813			0.688			0.938		0.833
	APP/DEPART	13	/	18	13	/	8	44	/	46	30	/	28	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Hamner	LOCATION #:	40
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

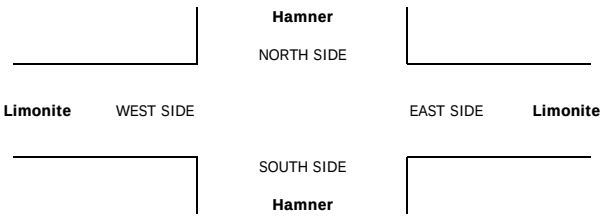
		NORTHBOUND (Hamner)			SOUTHBOUND (Hamner)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
	LANES:	NL 2	NT 3	NR 1	SL 2	ST 2	SR 1	EL 2	ET 3	ER 1	WL 2	WT 2	WR 1	TOTAL
AM	7:00 AM	0	0	0	0	0	0	2	2	0	0	5	1	10
	7:15 AM	0	0	0	0	0	0	0	1	0	0	6	0	7
	7:30 AM	0	0	0	3	0	0	0	3	0	2	0	0	8
	7:45 AM	1	0	0	0	2	0	0	0	0	1	3	0	7
	8:00 AM	0	0	0	0	0	0	1	1	0	1	0	0	3
	8:15 AM	0	0	0	0	0	0	0	1	0	2	4	0	7
	8:30 AM	0	0	0	0	0	0	0	1	0	2	3	1	7
	8:45 AM	0	0	3	0	0	0	0	0	0	0	2	0	5
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	1	0	3	3	2	0	3	9	0	8	23	2	54
	APPROACH %	25%	0%	75%	60%	40%	0%	25%	75%	0%	24%	70%	6%	
	APP/DEPART	4	/	5	5	/	10	12	/	15	33	/	24	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	1	0	0	3	2	0	2	6	0	3	14	1	32
	APPROACH %	100%	0%	0%	60%	40%	0%	25%	75%	0%	17%	78%	6%	
	PEAK HR FACTOR		0.250			0.417			0.500			0.750		0.800
	APP/DEPART	1	/	3	5	/	5	8	/	9	18	/	15	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	1	0	0	0	0	3	0	2	0	1	7
	4:15 PM	0	0	0	0	2	0	0	2	0	0	0	0	4
	4:30 PM	0	0	1	1	0	0	0	2	0	0	0	0	4
	4:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
	5:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
	5:15 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
	5:30 PM	0	0	0	1	0	0	0	3	0	0	0	0	4
	5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
	VOLUMES	0	0	2	2	2	0	0	16	0	2	2	1	27
	APPROACH %	0%	0%	100%	50%	50%	0%	0%	100%	0%	40%	40%	20%	
	APP/DEPART	2	/	1	4	/	4	16	/	20	5	/	2	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	0	2	1	2	0	0	10	0	2	0	1	18
	APPROACH %	0%	0%	100%	33%	67%	0%	0%	100%	0%	67%	0%	33%	
	PEAK HR FACTOR		0.500			0.375			0.833			0.250		0.643
	APP/DEPART	2	/	1	3	/	4	10	/	13	3	/	0	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR 0	SRR 0	ERR 0	WRR 1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	Hamner	LOCATION #:	40
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND Hamner			SOUTHBOUND Hamner			EASTBOUND Limonite			WESTBOUND Limonite			
LANES:	NL 2	NT 3	NR 1	SL 2	ST 2	SR 1	EL 2	ET 3	ER 1	WL 2	WT 2	WR 1	TOTAL
7:00 AM	0	0	0	0	0	1	1	4	0	2	3	1	12
7:15 AM	0	0	0	0	0	0	0	1	0	0	4	0	5
7:30 AM	0	0	0	1	0	0	0	2	0	0	3	0	6
7:45 AM	0	0	0	1	0	0	0	3	0	0	1	0	5
8:00 AM	0	0	0	0	2	0	0	4	0	0	2	0	8
8:15 AM	0	0	0	1	0	1	0	1	0	0	1	0	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	1	0	1	0	0	2	1	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	1	3	2	3	1	16	0	2	16	2	46
APPROACH %	0%	0%	100%	38%	25%	38%	6%	94%	0%	10%	80%	10%	
APP/DEPART	1	/	3	8	/	4	17	/	20	20	/	19	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	0	2	0	1	1	10	0	2	11	1	28
APPROACH %	0%	0%	0%	67%	0%	33%	9%	91%	0%	14%	79%	7%	
PEAK HR FACTOR		0.000			0.750			0.550			0.583		0.583
APP/DEPART	0	/	2	3	/	2	11	/	12	14	/	12	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
4:15 PM	0	1	0	0	0	0	0	0	0	1	0	0	2
4:30 PM	0	0	0	0	1	0	0	1	0	0	1	1	4
4:45 PM	0	0	0	0	0	0	0	1	0	0	2	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
5:15 PM	0	0	0	1	0	0	0	0	0	0	1	0	2
5:30 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	1	0	1	1	0	0	4	0	1	8	1	17
APPROACH %	0%	100%	0%	50%	50%	0%	0%	100%	0%	10%	80%	10%	
APP/DEPART	1	/	2	2	/	2	4	/	5	10	/	8	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	0	0	0	1	1	0	0	2	0	0	6	1	11
APPROACH %	0%	0%	0%	50%	50%	0%	0%	100%	0%	0%	86%	14%	
PEAK HR FACTOR		0.000			0.500			0.500			0.875		0.688
APP/DEPART	0	/	1	2	/	1	2	/	3	7	/	6	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

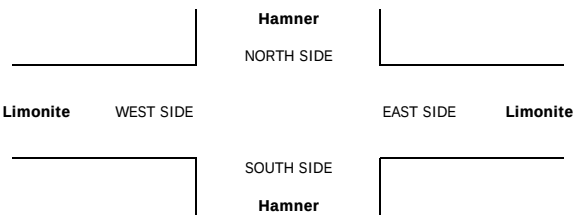
RTOR

NRR	SRR	ERR	WRR
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	3	0	0

NRR	SRR	ERR	WRR
0	1	0	0

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

NRR	SRR	ERR	WRR
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE: Thu, Apr 21, 16

LOCATION: Ontario
NORTH & SOUTH: I-15 SB Ramp
EAST & WEST: Limonite

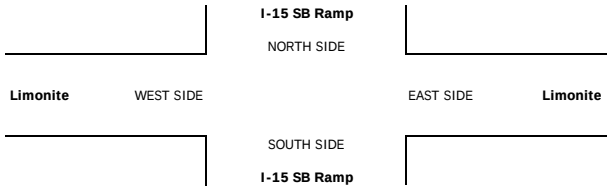
PROJECT #: SC0916
LOCATION #: 41
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

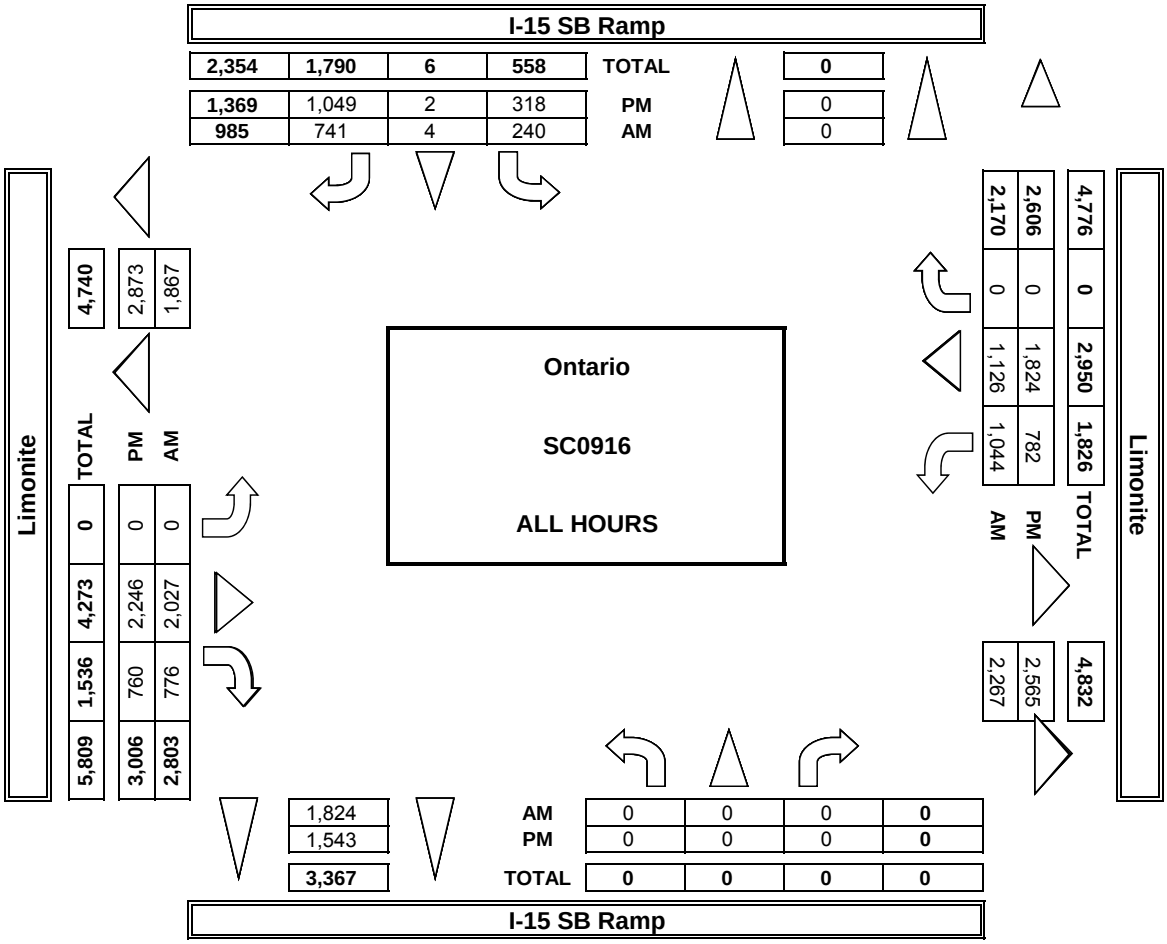
		NORTHBOUND (I-15 SB Ramp)			SOUTHBOUND (I-15 SB Ramp)			EASTBOUND (Limonite)			WESTBOUND (Limonite)				U-TURNS					RTOR			
	LANES:	NL X	NT X	NR X	SL 1,3	ST 0,3	SR 1,3	EL X	ET 2	ER 1	WL 2	WT 2	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	0	0	0	51	0	125	0	232	90	157	115	0	770	0	0	0	0	0	0	21	0	0
	7:15 AM	0	0	0	38	1	101	0	289	100	165	149	0	843	0	0	0	0	0	0	17	0	0
	7:30 AM	0	0	0	21	1	82	0	292	110	152	131	0	789	0	0	0	0	0	0	31	1	0
	7:45 AM	0	0	0	25	0	69	0	224	109	137	110	0	674	0	0	0	0	0	0	21	0	0
	8:00 AM	0	0	0	14	0	99	0	266	104	107	152	0	742	0	0	0	0	0	0	41	0	0
	8:15 AM	0	0	0	26	1	80	0	259	89	107	140	0	702	0	0	0	0	0	0	13	0	0
	8:30 AM	0	0	0	34	1	89	0	230	94	99	174	0	721	0	0	0	0	0	0	16	1	0
	8:45 AM	0	0	0	31	0	96	0	235	80	120	155	0	717	0	0	0	0	0	0	25	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	240	4	741	0	2,027	776	1,044	1,126	0	5,958	0	0	0	0	0	0	185	2	0
	APPROACH %	0%	0%	0%	24%	0%	75%	0%	72%	28%	48%	52%	0%										
	APP/DEPART	0	/	0	985	/	1,824	2,803	/	2,267	2,170	/	1,867	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	0	0	0	135	2	377	0	1,037	409	611	505	0	3,076						0	90	1	0
	APPROACH %	0%	0%	0%	26%	0%	73%	0%	72%	28%	55%	45%	0%										
	PEAK HR FACTOR		0.000			0.730			0.899			0.889		0.912									
	APP/DEPART	0	/	0	514	/	1,022	1,446	/	1,172	1,116	/	882	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	38	0	105	0	275	89	94	237	0	838	0	0	0	0	0	0	19	0	0
	4:15 PM	0	0	0	37	1	119	0	278	96	106	223	0	860	0	0	0	1	1	0	30	1	0
	4:30 PM	0	0	0	40	0	112	0	324	85	101	230	0	892	0	0	0	0	0	0	26	0	0
	4:45 PM	0	0	0	38	1	118	0	304	99	88	211	0	859	0	0	0	0	0	0	16	0	0
	5:00 PM	0	0	0	40	0	128	0	270	92	95	236	0	861	0	0	0	0	0	0	21	0	0
	5:15 PM	0	0	0	45	0	136	0	261	104	107	236	0	889	0	0	0	0	0	0	26	0	0
	5:30 PM	0	0	0	36	0	157	0	251	91	94	239	0	868	0	0	0	0	0	0	12	0	0
	5:45 PM	0	0	0	44	0	174	0	283	104	97	212	0	914	0	0	0	0	0	0	25	0	0
	VOLUMES	0	0	0	318	2	1,049	0	2,246	760	782	1,824	0	6,981	0	0	0	1	1	0	175	1	0
	APPROACH %	0%	0%	0%	23%	0%	77%	0%	75%	25%	30%	70%	0%										
	APP/DEPART	0	/	0	1,369	/	1,543	3,006	/	2,565	2,606	/	2,873	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	0	0	0	165	0	595	0	1,065	391	393	923	0	3,532						0	84	0	0
	APPROACH %	0%	0%	0%	22%	0%	78%	0%	73%	27%	30%	70%	0%										
	PEAK HR FACTOR		0.000			0.872			0.941			0.959		0.966									
	APP/DEPART	0	/	0	760	/	784	1,456	/	1,230	1,316	/	1,518	0									

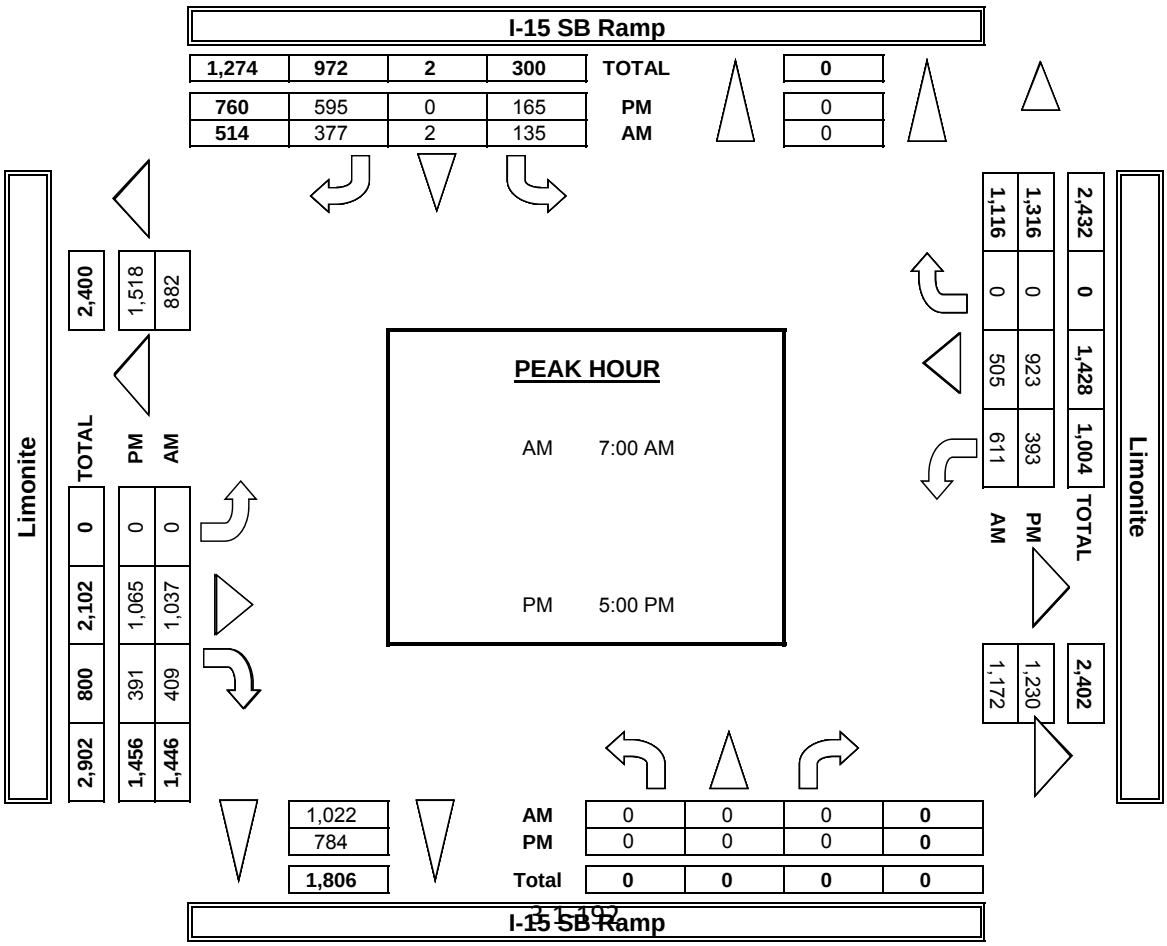


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	7:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	7:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	7:45 AM	0	0	0	2	2	0	0	0	2	2	0	0	0	0	0
	8:00 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	0	1	5	6	0	0	0	3	3	0	0	1	2	3
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	5:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
	5:30 PM	1	0	0	2	3	1	0	0	1	2	0	0	0	1	1
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	1	0	0	5	6	1	0	0	1	2	0	0	0	4	4

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	I-15 SB Ramp	LOCATION #:	41
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND I-15 SB Ramp			SOUTHBOUND I-15 SB Ramp			EASTBOUND Limonite			WESTBOUND Limonite			
LANES:	NL X	NT X	NR X	SL 1,3	ST 0,3	SR 1,3	EL X	ET 2	ER 1	WL 2	WT 2	WR X	TOTAL
7:00 AM	0	0	0	3	0	19	0	12	5	17	17	0	73
7:15 AM	0	0	0	1	0	12	0	9	3	15	17	0	57
7:30 AM	0	0	0	2	0	7	0	13	6	10	10	0	48
7:45 AM	0	0	0	5	0	14	0	8	5	6	12	0	50
8:00 AM	0	0	0	2	0	14	0	12	6	11	14	0	59
8:15 AM	0	0	0	3	0	7	0	9	5	5	12	0	41
8:30 AM	0	0	0	9	1	12	0	10	3	10	12	0	57
8:45 AM	0	0	0	1	0	17	0	17	3	12	12	0	62
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	26	1	102	0	90	36	86	106	0	447
APPROACH %	0%	0%	0%	20%	1%	79%	0%	71%	29%	45%	55%	0%	
APP/DEPART	0	/	0	129	/	123	126	/	116	192	/	208	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	0	11	0	52	0	42	19	48	56	0	228
APPROACH %	0%	0%	0%	17%	0%	83%	0%	69%	31%	46%	54%	0%	
PEAK HR FACTOR		0.000			0.716			0.803			0.765		0.781
APP/DEPART	0	/	0	63	/	67	61	/	53	104	/	108	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	2	0	5	0	11	9	8	4	0	39
4:15 PM	0	0	0	1	0	4	0	23	4	9	7	0	48
4:30 PM	0	0	0	1	0	7	0	10	5	7	7	0	37
4:45 PM	0	0	0	6	0	6	0	12	8	3	10	0	45
5:00 PM	0	0	0	4	0	8	0	14	3	2	9	0	40
5:15 PM	0	0	0	0	0	0	0	10	1	2	8	0	21
5:30 PM	0	0	0	3	0	8	0	13	6	4	7	0	41
5:45 PM	0	0	0	2	0	1	0	10	5	5	5	0	28
VOLUMES	0	0	0	19	0	39	0	103	41	40	57	0	299
APPROACH %	0%	0%	0%	33%	0%	67%	0%	72%	28%	41%	59%	0%	
APP/DEPART	0	/	0	58	/	81	144	/	122	97	/	96	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	0	0	0	12	0	25	0	59	20	21	33	0	170
APPROACH %	0%	0%	0%	32%	0%	68%	0%	75%	25%	39%	61%	0%	
PEAK HR FACTOR		0.000			0.771			0.731			0.844		0.885
APP/DEPART	0	/	0	37	/	41	79	/	71	54	/	58	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	2	0	0
0	3	0	0
0	1	0	0
0	1	0	0
0	1	0	0
0	0	0	0
0	2	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	10	0	0
0	7	0	0
0	0	0	0
0	1	0	0
0	1	0	0
0	3	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	5	0	0
0	4	0	0

I-15 SB Ramp

NORTH SIDE

Limonite WEST SIDE EAST SIDE **Limonite**

SOUTH SIDE

I-15 SB Ramp

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	I-15 SB Ramp	LOCATION #:	41
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (I-15 SB Ramp)			SOUTHBOUND (I-15 SB Ramp)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
	LANES:	NL X	NT X	NR X	SL 1,3	ST 0,3	SR 1,3	EL X	ET 2	ER 1	WL 2	WT 2	WR X	TOTAL
AM	7:00 AM	0	0	0	0	0	4	0	2	0	2	2	0	10
	7:15 AM	0	0	0	1	0	3	0	2	2	4	2	0	14
	7:30 AM	0	0	0	0	0	3	0	1	1	2	0	0	7
	7:45 AM	0	0	0	2	0	0	0	3	1	2	1	0	9
	8:00 AM	0	0	0	0	0	3	0	2	0	2	2	0	9
	8:15 AM	0	0	0	0	0	2	0	2	0	2	4	0	10
	8:30 AM	0	0	0	0	0	2	0	0	2	0	5	0	9
	8:45 AM	0	0	0	1	0	2	0	3	1	1	0	0	8
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	4	0	19	0	15	7	15	16	0	76
	APPROACH %	0%	0%	0%	17%	0%	83%	0%	68%	32%	48%	52%	0%	
	APP/DEPART	0	/	0	23	/	22	22	/	19	31	/	35	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	0	0	3	0	10	0	8	4	10	5	0	40
	APPROACH %	0%	0%	0%	23%	0%	77%	0%	67%	33%	67%	33%	0%	
	PEAK HR FACTOR		0.000			0.813			0.750			0.625		0.714
	APP/DEPART	0	/	0	13	/	14	12	/	11	15	/	15	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	1	0	1	0	3	1	0	2	0	8
	4:15 PM	0	0	0	1	0	1	0	5	0	2	1	0	10
	4:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	2
	4:45 PM	0	0	0	0	0	0	0	4	1	0	0	0	5
	5:00 PM	0	0	0	1	0	0	0	0	1	2	1	0	5
	5:15 PM	0	0	0	0	0	0	0	1	0	1	0	0	2
	5:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
	5:45 PM	0	0	0	0	0	0	0	1	0	3	0	0	4
	VOLUMES	0	0	0	3	0	2	0	18	3	9	4	0	39
	APPROACH %	0%	0%	0%	60%	0%	40%	0%	86%	14%	69%	31%	0%	
	APP/DEPART	0	/	0	5	/	12	21	/	21	13	/	6	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	0	0	0	2	0	2	0	13	2	3	3	0	25
	APPROACH %	0%	0%	0%	50%	0%	50%	0%	87%	13%	50%	50%	0%	
	PEAK HR FACTOR		0.000			0.500			0.750			0.500		0.625
	APP/DEPART	0	/	0	4	/	5	15	/	15	6	/	5	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	1	0	0
0	1	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
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0	0	0	0
0	0	0	0
0	0	0	0
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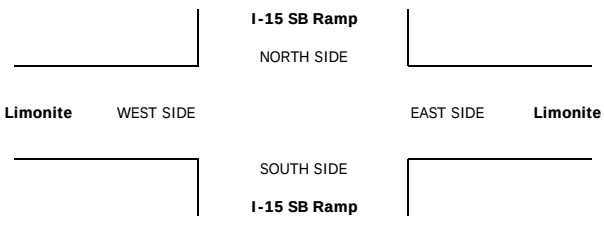
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	I-15 SB Ramp	LOCATION #:	41
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

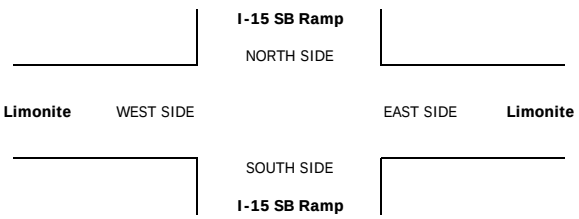
		NORTHBOUND I-15 SB Ramp			SOUTHBOUND I-15 SB Ramp			EASTBOUND Limonite			WESTBOUND Limonite			
	LANES:	NL X	NT X	NR X	SL 1,3	ST 0,3	SR 1,3	EL X	ET 2	ER 1	WL 2	WT 2	WR X	TOTAL
AM	7:00 AM	0	0	0	2	0	4	0	0	3	3	2	0	14
	7:15 AM	0	0	0	0	0	1	0	1	0	0	2	0	4
	7:30 AM	0	0	0	1	0	2	0	2	1	0	1	0	7
	7:45 AM	0	0	0	1	0	2	0	2	5	3	1	0	14
	8:00 AM	0	0	0	1	0	0	0	1	2	0	2	0	6
	8:15 AM	0	0	0	2	0	2	0	3	1	1	3	0	12
	8:30 AM	0	0	0	1	0	0	0	0	0	1	0	0	2
	8:45 AM	0	0	0	1	0	0	0	1	1	1	2	0	6
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	0	0	9	0	11	0	10	13	9	13	0	65
	APPROACH %	0%	0%	0%	45%	0%	55%	0%	43%	57%	41%	59%	0%	
	APP/DEPART	0	/	0	20	/	22	23	/	19	22	/	24	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	0	0	5	0	6	0	8	9	4	7	0	39
	APPROACH %	0%	0%	0%	45%	0%	55%	0%	47%	53%	36%	64%	0%	
	PEAK HR FACTOR		0.000			0.458			0.607			0.550		0.696
	APP/DEPART	0	/	0	11	/	13	17	/	13	11	/	13	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	2	0	2	0	1	0	0	1	0	6
	4:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	2
	4:30 PM	0	0	0	0	0	2	0	1	0	1	0	0	4
	4:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
	5:00 PM	0	0	0	1	0	0	0	0	0	3	2	0	6
	5:15 PM	0	0	0	0	0	1	0	1	2	1	0	0	5
	5:30 PM	0	0	0	1	0	0	0	1	1	0	0	0	3
	5:45 PM	0	0	0	2	0	1	0	0	0	1	3	0	7
	VOLUMES	0	0	0	6	0	6	0	4	5	7	6	0	34
	APPROACH %	0%	0%	0%	50%	0%	50%	0%	44%	56%	54%	46%	0%	
	APP/DEPART	0	/	0	12	/	12	9	/	10	13	/	12	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	0	0	0	4	0	2	0	2	3	5	5	0	21
	APPROACH %	0%	0%	0%	67%	0%	33%	0%	40%	60%	50%	50%	0%	
	PEAK HR FACTOR		0.000			0.500			0.417			0.500		0.750
	APP/DEPART	0	/	0	6	/	8	5	/	6	10	/	7	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
Thu, Apr 21, 16	NORTH & SOUTH:	I-15 NB Ramp	LOCATION #:	42
	EAST & WEST:	Limonite	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

		NORTHBOUND (I-15 NB Ramp)			SOUTHBOUND (I-15 NB Ramp)			EASTBOUND (Limonite)			WESTBOUND (Limonite)				U-TURNS					RTOR			
	LANES:	NL 1,3	NT 0,3	NR 1,3	SL X	ST X	SR X	EL 2	ET 2	ER X	WL X	WT 2	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	41	2	73	0	0	0	151	118	0	0	235	92	712	0	0	0	0	0	52	0	0	9
	7:15 AM	54	0	78	0	0	0	193	139	0	0	265	93	822	0	0	0	0	0	51	0	0	27
	7:30 AM	41	0	63	0	0	0	207	121	0	0	244	84	760	0	0	0	0	0	51	0	0	12
	7:45 AM	36	0	93	0	0	0	148	110	0	0	210	67	664	0	0	0	0	0	63	0	0	6
	8:00 AM	47	0	69	0	0	0	159	95	0	0	208	54	632	0	0	0	0	0	48	0	0	13
	8:15 AM	49	0	66	0	0	0	145	143	0	0	207	87	697	0	0	0	0	0	47	0	0	11
	8:30 AM	64	0	59	0	0	0	145	134	0	0	223	59	684	0	0	0	0	0	46	0	0	5
	8:45 AM	58	0	94	0	0	0	159	113	0	0	222	61	707	0	0	0	0	0	63	0	0	7
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	390	2	595	0	0	0	1,307	973	0	0	1,814	597	5,678	0	0	0	0	0	421	0	0	90
	APPROACH %	40%	0%	60%	0%	0%	0%	57%	43%	0%	0%	75%	25%										
	APP/DEPART	987	/	1,906	0	/	0	2,280	/	1,568	2,411	/	2,204	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	172	2	307	0	0	0	699	488	0	0	954	336	2,958						217	0	0	54
	APPROACH %	36%	0%	64%	0%	0%	0%	59%	41%	0%	0%	74%	26%										
	PEAK HR FACTOR		0.911			0.000			0.894			0.901		0.900									
	APP/DEPART	481	/	1,037	0	/	0	1,187	/	795	1,290	/	1,126	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	75	0	139	0	0	0	114	214	0	0	234	63	839	0	0	0	0	0	66	0	0	3
	4:15 PM	94	0	158	0	0	0	115	212	0	0	240	51	870	0	0	0	0	0	54	0	0	9
	4:30 PM	89	0	144	0	0	0	140	213	0	1	244	45	876	0	0	0	0	0	54	0	0	9
	4:45 PM	76	0	168	0	0	0	126	226	0	0	237	35	868	0	0	0	0	0	62	0	0	8
	5:00 PM	100	1	155	0	0	0	110	223	0	0	236	37	862	0	0	0	0	0	56	0	0	4
	5:15 PM	109	0	151	0	0	0	119	198	0	0	251	47	875	0	0	0	0	0	58	0	0	8
	5:30 PM	103	0	167	0	0	0	110	179	0	0	236	48	843	0	0	0	0	0	57	0	0	10
	5:45 PM	81	0	140	0	0	0	97	204	0	0	220	46	788	0	0	0	0	0	47	0	0	9
	VOLUMES	727	1	1,222	0	0	0	931	1,669	0	1	1,898	372	6,821	0	0	0	0	0	454	0	0	60
	APPROACH %	37%	0%	63%	0%	0%	0%	36%	64%	0%	0%	84%	16%										
	APP/DEPART	1,950	/	1,304	0	/	1	2,600	/	2,891	2,271	/	2,625	0									
	BEGIN PEAK HR		4:30 PM																				
	VOLUMES	374	1	618	0	0	0	495	860	0	1	968	164	3,481						230	0	0	29
	APPROACH %	38%	0%	62%	0%	0%	0%	37%	63%	0%	0%	85%	14%										
	PEAK HR FACTOR		0.955			0.000			0.960			0.951		0.993									
	APP/DEPART	993	/	660	0	/	1	1,355	/	1,478	1,133	/	1,342	0									

I-15 NB Ramp

NORTH SIDE

Limonite WEST SIDE EAST SIDE **Limonite**

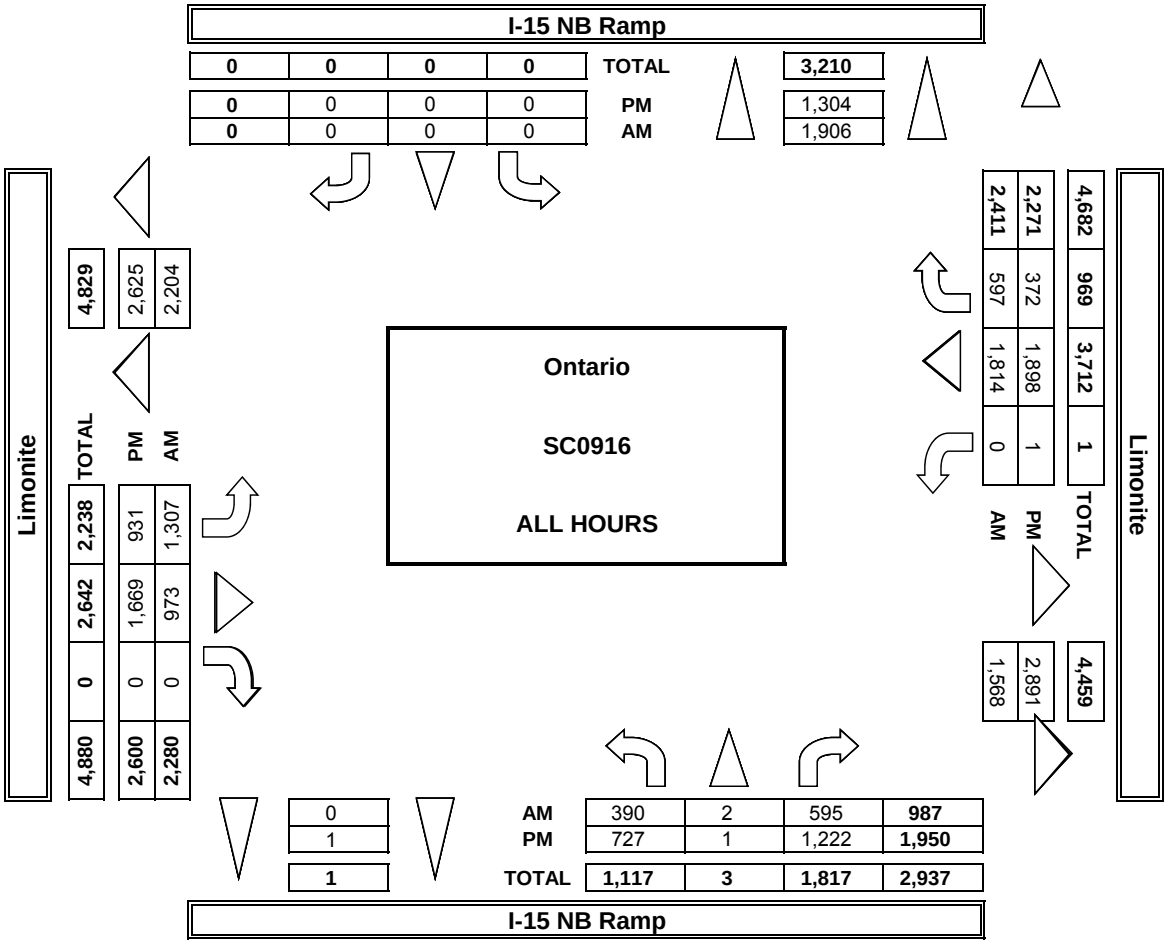
SOUTH SIDE

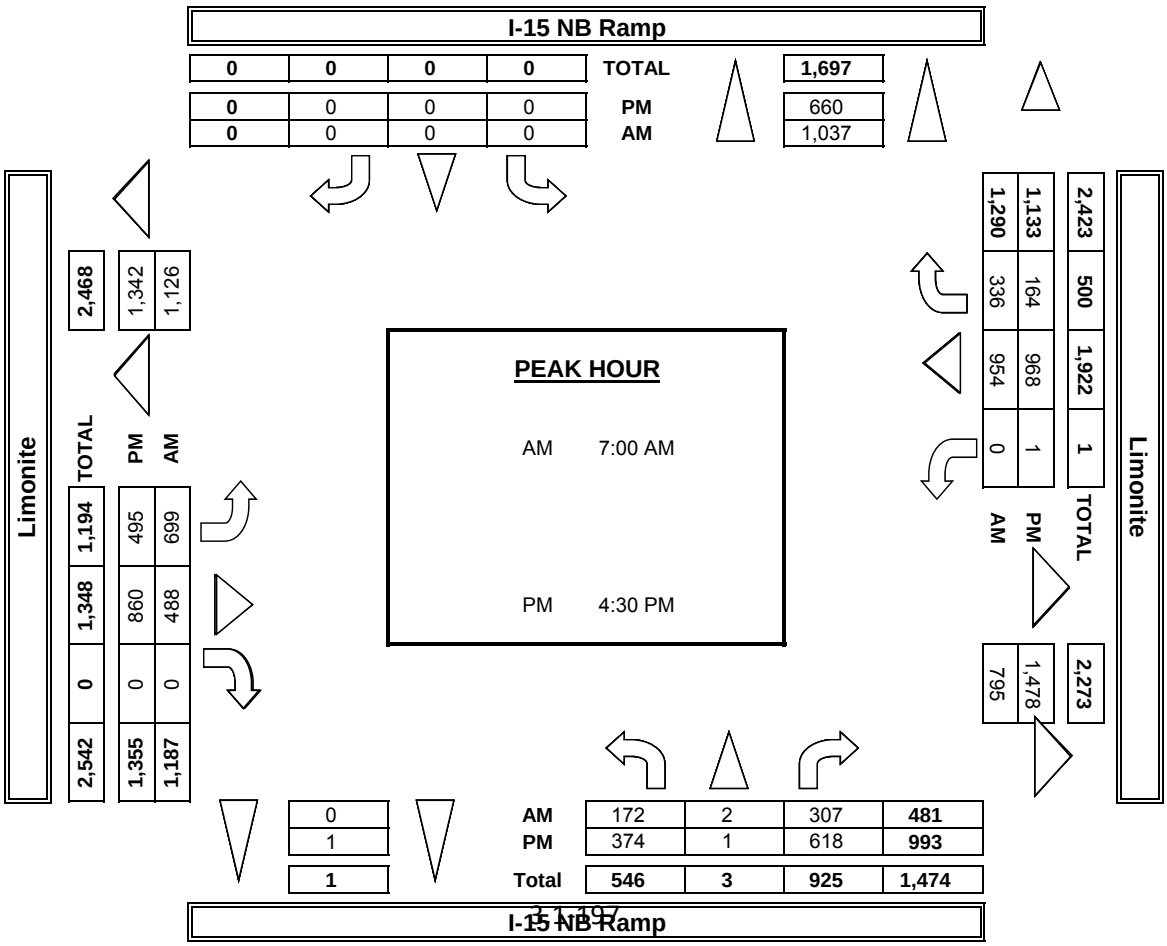
I-15 NB Ramp

		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	1	3	0	4	0	0	2	0	2	0	1	1	0	2
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	0	1	4	3	8	0	0	2	0	2	0	1	2	3	6
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
	5:00 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2
	5:15 PM	0	2	1	0	3	0	2	1	0	3	0	0	0	0	0
	5:30 PM	1	0	1	1	3	1	0	1	1	3	0	0	0	0	0
	5:45 PM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0
	TOTAL	2	2	6	3	13	2	2	6	1	11	0	0	0	2	2

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	I-15 NB Ramp	LOCATION #:	42
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

	NORTHBOUND I-15 NB Ramp			SOUTHBOUND I-15 NB Ramp			EASTBOUND Limonite			WESTBOUND Limonite			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1,3	0,3	1,3	X	X	X	2	2	X	X	2	1	
7:00 AM	1	1	6	0	0	0	9	6	0	0	19	2	44
7:15 AM	5	0	5	0	0	0	7	5	0	0	16	2	40
7:30 AM	1	0	3	0	0	0	8	7	0	0	19	1	39
7:45 AM	3	0	4	0	0	0	11	6	0	0	17	3	44
8:00 AM	1	0	2	0	0	0	8	5	0	0	31	0	47
8:15 AM	4	0	4	0	0	0	12	7	0	0	21	6	54
8:30 AM	2	0	3	0	0	0	9	6	0	0	19	0	39
8:45 AM	5	0	8	0	0	0	14	8	0	0	16	4	55
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	22	1	35	0	0	0	78	50	0	0	158	18	362
APPROACH %	38%	2%	60%	0%	0%	0%	61%	39%	0%	0%	90%	10%	
APP/DEPART	58	/	97	0	/	0	128	/	85	176	/	180	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	12	0	17	0	0	0	43	26	0	0	87	10	195
APPROACH %	41%	0%	59%	0%	0%	0%	62%	38%	0%	0%	90%	10%	
PEAK HR FACTOR		0.558			0.000			0.784			0.782		0.886
APP/DEPART	29	/	53	0	/	0	69	/	43	97	/	99	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	10	0	0	0	1	4	0	0	7	1	23
4:15 PM	2	0	9	0	0	0	7	8	0	0	10	1	37
4:30 PM	5	0	3	0	0	0	4	13	0	0	11	2	38
4:45 PM	1	0	7	0	0	0	4	8	0	0	8	0	28
5:00 PM	2	0	4	0	0	0	5	9	0	0	9	0	29
5:15 PM	1	0	3	0	0	0	3	12	0	0	9	0	28
5:30 PM	4	0	12	0	0	0	6	11	0	0	11	2	46
5:45 PM	1	0	8	0	0	0	5	8	0	0	11	1	34
VOLUMES	16	0	56	0	0	0	35	73	0	0	76	7	263
APPROACH %	22%	0%	78%	0%	0%	0%	32%	68%	0%	0%	92%	8%	
APP/DEPART	72	/	42	0	/	0	108	/	129	83	/	92	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	8	0	27	0	0	0	19	40	0	0	40	3	137
APPROACH %	23%	0%	77%	0%	0%	0%	32%	68%	0%	0%	93%	7%	
PEAK HR FACTOR		0.547			0.000			0.868			0.827		0.745
APP/DEPART	35	/	22	0	/	0	59	/	67	43	/	48	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

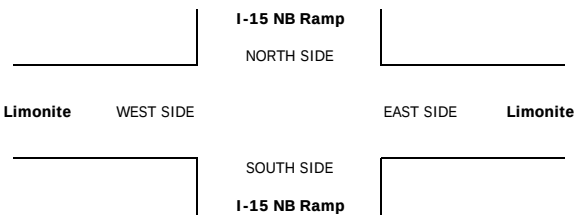
RTOR

NRR	SRR	ERR	WRR
0	0	0	1
1	0	0	0
4	0	0	0
0	0	0	0
1	0	0	0
1	0	0	0
0	0	0	1
2	0	0	0
3	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
12	0	0	1

NRR	SRR	ERR	WRR
6	0	0	1

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
3	0	0	0
4	0	0	0
1	0	0	0
2	0	0	0
1	0	0	0
2	0	0	0
5	0	0	0
3	0	0	0
21	0	0	0

NRR	SRR	ERR	WRR
11	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	I-15 NB Ramp	LOCATION #:	42
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND (I-15 NB Ramp)			SOUTHBOUND (I-15 NB Ramp)			EASTBOUND (Limonite)			WESTBOUND (Limonite)			
	LANES:	NL 1,3	NT 0,3	NR 1,3	SL X	ST X	SR X	EL 2	ET 2	ER X	WL X	WT 2	WR 1	TOTAL
AM	7:00 AM	0	0	0	0	0	0	1	0	0	0	4	1	6
	7:15 AM	2	0	0	0	0	0	2	1	0	0	2	2	9
	7:30 AM	0	0	1	0	0	0	3	1	0	0	1	3	9
	7:45 AM	2	0	3	0	0	0	0	1	0	0	2	0	8
	8:00 AM	0	0	0	0	0	0	1	2	0	0	3	0	6
	8:15 AM	2	0	0	0	0	0	3	1	0	0	3	0	9
	8:30 AM	0	0	0	0	0	0	1	1	0	0	5	0	7
	8:45 AM	0	0	0	0	0	0	2	0	0	0	3	1	6
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	6	0	4	0	0	0	13	7	0	0	23	7	60
	APPROACH %	60%	0%	40%	0%	0%	0%	65%	35%	0%	0%	77%	23%	
	APP/DEPART	10	/	20	0	/	0	20	/	11	30	/	29	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	4	0	4	0	0	0	7	5	0	0	9	3	32
	APPROACH %	50%	0%	50%	0%	0%	0%	58%	42%	0%	0%	75%	25%	
	PEAK HR FACTOR		0.400			0.000			0.750			0.600		0.889
	APP/DEPART	8	/	10	0	/	0	12	/	9	12	/	13	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	0	5	0	0	0	1	1	0	0	1	0	9
	4:15 PM	0	0	1	0	0	0	3	1	0	0	4	1	10
	4:30 PM	0	0	1	0	0	0	2	0	0	0	0	0	3
	4:45 PM	0	0	1	0	0	0	3	0	0	0	0	0	4
	5:00 PM	0	0	1	0	0	0	1	1	0	0	2	0	5
	5:15 PM	0	0	2	0	0	0	1	0	0	0	2	1	6
	5:30 PM	0	0	0	0	0	0	2	1	0	0	0	1	4
	5:45 PM	0	0	0	0	0	0	2	0	0	0	2	0	4
	VOLUMES	1	0	11	0	0	0	15	4	0	0	11	3	45
	APPROACH %	8%	0%	92%	0%	0%	0%	79%	21%	0%	0%	79%	21%	
	APP/DEPART	12	/	18	0	/	0	19	/	15	14	/	12	0
	BEGIN PEAK HR		4:00 PM											
	VOLUMES	1	0	8	0	0	0	9	2	0	0	5	1	26
	APPROACH %	11%	0%	89%	0%	0%	0%	82%	18%	0%	0%	83%	17%	
	PEAK HR FACTOR		0.375			0.000			0.688			0.300		0.650
	APP/DEPART	9	/	10	0	/	0	11	/	10	6	/	6	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 pacific@aimtd.com

DATE:	LOCATION:	Ontario	PROJECT #:	SC0916
4/21/16	NORTH & SOUTH:	I-15 NB Ramp	LOCATION #:	42
THURSDAY	EAST & WEST:	Limonite	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

	NORTHBOUND I-15 NB Ramp			SOUTHBOUND I-15 NB Ramp			EASTBOUND Limonite			WESTBOUND Limonite			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1,3	0,3	1,3	X	X	X	2	2	X	X	2	1	
7:00 AM	1	0	0	0	0	0	0	0	0	0	1	1	3
7:15 AM	0	0	1	0	0	0	1	1	0	0	2	1	6
7:30 AM	1	0	0	0	0	0	2	2	0	0	2	0	7
7:45 AM	0	0	0	0	0	0	1	0	0	0	1	2	4
8:00 AM	2	0	0	0	0	0	0	2	0	0	2	1	7
8:15 AM	1	0	0	0	0	0	1	2	0	0	2	2	8
8:30 AM	1	0	1	0	0	0	2	1	0	0	3	0	8
8:45 AM	1	0	0	0	0	0	0	2	0	0	1	0	4
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	7	0	2	0	0	0	7	10	0	0	14	7	47
APPROACH %	78%	0%	22%	0%	0%	0%	41%	59%	0%	0%	67%	33%	
APP/DEPART	9	/	14	0	/	0	17	/	12	21	/	21	0
BEGIN PEAK HR		7:45 AM											
VOLUMES	5	0	1	0	0	0	3	7	0	0	8	3	27
APPROACH %	83%	0%	17%	0%	0%	0%	30%	70%	0%	0%	73%	27%	
PEAK HR FACTOR		0.750			0.000			0.833			0.688		0.844
APP/DEPART	6	/	6	0	/	0	10	/	8	11	/	13	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	2
4:30 PM	0	0	1	0	0	0	1	1	0	0	1	0	4
4:45 PM	0	0	1	0	0	0	0	2	0	0	0	0	3
5:00 PM	2	0	2	0	0	0	0	1	0	0	2	0	7
5:15 PM	0	0	0	0	0	0	1	0	0	0	1	0	2
5:30 PM	0	0	1	0	0	0	1	1	0	0	2	0	5
5:45 PM	3	0	0	0	0	0	0	2	0	0	0	0	5
VOLUMES	5	0	5	0	0	0	3	8	0	0	7	1	29
APPROACH %	50%	0%	50%	0%	0%	0%	27%	73%	0%	0%	88%	13%	
APP/DEPART	10	/	4	0	/	0	11	/	13	8	/	12	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	5	0	3	0	0	0	2	4	0	0	5	0	19
APPROACH %	63%	0%	38%	0%	0%	0%	33%	67%	0%	0%	100%	0%	
PEAK HR FACTOR		0.500			0.000			0.750			0.625		0.679
APP/DEPART	8	/	2	0	/	0	6	/	7	5	/	10	0

U-TURNS

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

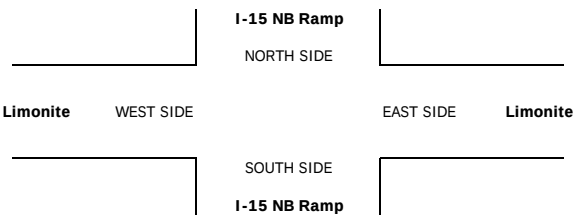
RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0

NB	SB	EB	WB	TTL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Wednesday, May 18, 2016 **Request ID** **Station ID** **Int Distance** **LOCATION#**

JOB #: SC0952 928 ADT1 Central north of El Prado

AM	EASTBOUND														PM	EASTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	12	2	0	1	3	0	0	0	0	0	0	0	18	12:00	4	157	17	3	8	2	0	1	0	0	0	0	0	192
0:15	0	7	0	0	1	3	1	0	0	0	0	0	0	12	12:15	6	116	17	6	7	1	0	2	3	0	0	1	1	160
0:30	0	6	0	0	0	3	0	0	0	0	0	0	0	9	12:30	3	110	15	2	14	3	0	3	1	0	0	1	0	152
0:45	0	10	0	0	0	2	0	0	0	0	0	0	0	12	12:45	0	103	15	0	8	2	0	1	2	0	0	0	0	131
1:00	0	10	0	0	0	1	0	0	0	0	1	0	0	12	13:00	1	123	18	3	5	5	0	1	1	0	1	0	0	158
1:15	0	2	3	0	0	1	0	0	0	0	0	0	0	6	13:15	1	124	13	2	9	2	0	1	7	0	1	0	0	160
1:30	0	3	0	0	0	3	0	0	0	0	0	0	0	6	13:30	2	167	29	2	5	3	0	3	2	0	0	1	0	214
1:45	0	6	0	0	0	3	1	0	0	0	0	0	0	10	13:45	1	135	24	4	7	8	0	1	2	0	0	0	0	182
2:00	0	5	1	0	0	3	0	0	0	0	0	0	0	9	14:00	4	131	26	4	8	4	0	2	4	0	2	0	0	185
2:15	1	3	1	0	0	2	0	0	0	0	0	0	0	7	14:15	1	116	14	1	10	8	0	2	1	0	0	0	0	153
2:30	0	13	0	0	0	3	0	0	0	0	0	0	0	16	14:30	6	205	33	2	15	5	1	1	2	0	2	0	1	273
2:45	0	4	0	0	1	1	0	0	0	0	0	0	0	6	14:45	5	184	14	3	13	4	0	0	3	0	0	0	1	227
3:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4	15:00	0	146	13	1	9	5	0	1	3	0	1	1	0	180
3:15	0	2	0	0	1	1	0	0	0	0	0	0	0	4	15:15	1	132	20	4	8	4	2	3	0	1	1	0	0	176
3:30	0	11	0	0	1	4	0	0	1	0	0	0	0	17	15:30	2	186	15	1	12	8	1	0	0	1	1	0	0	227
3:45	0	16	5	0	1	2	0	0	1	0	0	0	0	25	15:45	4	179	16	1	11	3	0	0	2	0	0	1	0	217
4:00	0	12	1	0	1	2	0	0	1	0	0	0	0	17	16:00	8	187	19	2	5	3	0	4	1	0	1	0	0	230
4:15	0	27	2	1	1	5	0	0	0	0	0	0	0	36	16:15	1	154	18	2	8	2	0	1	1	0	0	0	0	187
4:30	0	32	3	1	2	2	0	0	0	0	0	0	0	40	16:30	3	186	21	1	14	3	0	0	2	0	0	0	0	230
4:45	3	51	8	0	2	2	0	0	2	0	0	0	0	68	16:45	2	199	17	0	7	3	0	2	1	0	0	1	0	232
5:00	0	52	11	0	3	1	0	0	0	0	0	0	0	67	17:00	1	194	22	3	4	4	0	0	1	0	0	0	0	229
5:15	1	87	16	1	4	0	0	0	2	0	0	0	0	111	17:15	2	188	13	1	7	3	1	1	2	0	0	1	1	220
5:30	0	91	27	0	4	2	0	0	0	0	0	0	0	124	17:30	2	193	18	0	8	4	1	2	0	0	1	0	0	229
5:45	1	150	20	1	8	3	0	1	2	0	0	0	0	186	17:45	5	159	14	1	5	6	1	1	0	0	0	1	1	194
6:00	0	127	19	0	6	0	0	0	0	0	1	0	1	154	18:00	3	151	15	0	5	6	0	0	0	0	0	0	2	182
6:15	1	140	20	0	12	1	0	0	1	0	1	0	0	176	18:15	2	150	13	0	4	1	0	0	0	0	0	0	0	170
6:30	0	151	30	1	12	1	0	0	0	0	1	0	1	197	18:30	2	135	12	0	3	6	0	0	1	0	0	0	0	159
6:45	3	190	28	2	8	3	0	0	1	0	0	0	0	235	18:45	2	142	11	0	3	4	0	0	0	0	0	0	0	162
7:00	4	204	22	1	7	7	1	0	0	0	0	1	0	247	19:00	0	96	7	0	6	2	0	1	0	0	0	1	0	113
7:15	1	254	25	0	8	6	1	0	1	0	0	0	1	297	19:15	0	110	11	0	2	3	0	0	0	0	0	0	0	126
7:30	3	259	23	1	14	6	1	0	2	0	0	1	0	310	19:30	0	83	13	0	3	2	0	0	0	0	0	0	0	101
7:45	1	249	28	0	9	6	0	0	4	0	1	0	0	298	19:45	1	76	7	0	5	1	0	0	0	0	0	0	0	90
8:00	8	214	17	0	8	7	1	1	0	1	0	0	0	257	20:00	1	88	6	0	1	2	0	0	0	0	0	0	0	98
8:15	5	204	19	1	6	7	0	0	5	1	1	0	1	250	20:15	0	66	9	0	3	0	0	0	0	0	0	0	0	78
8:30	5	203	18	0	7	5	1	1	2	0	0	0	0	242	20:30	0	70	3	0	3	1	0	0	0	0	0	0	0	77
8:45	0	207	24	3	14	9	0	3	2	0	0	0	0	262	20:45	0	55	3	0	2	2	0	0	0	0	0	1	0	63
9:00	5	146	17	0	7	4	1	2	0	1	1	0	1	185	21:00	0	60	4	0	1	1	0	0	0	0	0	0	0	66
9:15	2	132	18	2	11	5	0	0	1	0	0	0	1	172	21:15	0	53	3	0	2	3	0	0	0	0	0	0	0	61
9:30	1	104	20	0	11	2	0	0	1	0	0	0	0	139	21:30	0	45	6	0	2	1	0	0	0	0	0	0	0	54
9:45	0	89	24	0	5	3	0	4	0	0	0	0	0	125	21:45	0	42	6	0	1	0	0	0	0	0	0	0	0	49
10:00	0	114	19	3	5	4	0	1	2	0	0	0	0	148	22:00	0	31	3	0	0	0	0	0	0	0	0	0	0	34
10:15	3	87	23	2	9	2	0	1	2	0	0	0	1	130	22:15	0	34	1	0	0	0	0	0	0	0	0	0	0	35
10:30	3	93	18	0	8	5	1	2	1	0	0	0	0	131	22:30	0	29	2	0	0	0	0	0	0	0	0	0	0	31
10:45	3	102	21	2	5	4	0	2	2	1	0	0	1	143	22:45	0	24	1	0	1	1	0	0	0	0	0	0	0	27
11:00	1	91	23	1	10	1	0	2	1	0	0	0	1	131	23:00	0	27	0	0	0	1	0	0	0	0	0	0	0	28
11:15	2	119	20	1	9	3	1	1	3	1	2	0	1	163	23:15	0	13	0	0	0	1	0	0	0	0	0	0	0	14
11:30	1	112	21	6	7	2	0	0	0	0	1	0	0	150	23:30	0	25	1	0	0	0	0	0	0	0	0	0	0	26
11:45	2	104	23	2	8	8	0	5	2	0	1	0	1	156	23:45	0	11	2	0	0	0	0	0	0	0	0	0	0	13
TOTAL	60	4,311	620	32	237	153	10	26	42	5	11	2	11	5,520	TOTAL	76	5,390	580	49	254	133	7	34	42	2	11	10	7	6,595
										AM PEAK HOUR				7:15 AM										PM PEAK HOUR				4:30 PM
										AM PEAK VOLUME				1,162										PM PEAK VOLUME				911

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	136	9,701	1,200	81	491	286	17	60	84	7	22	12	18	12,115
% OF TOTAL	1.1%	80.1%	9.9%	0.7%	4.1%	2.4%	0.1%	0.5%	0.7%	0.1%	0.2%	0.1%	0.1%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
TOTAL: ALL	235	####	2,737	182	1,022	486	37	121	202	19	34	27	49	24,793
% OF TOTAL	1.9%	162.1%	22.6%	1.5%	8.4%	4.0%	0.3%	1.0%	1.7%	0.2%	0.3%	0.2%	0.4%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Wednesday, May 18, 2016 **Request ID** **Station ID** **Distance Feet** 928 **LOCATION#** ADT1 Central north of El Prado

JOB #:

AM	WESTBOUND														PM	WESTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	15	3	0	0	1	0	0	0	0	0	0	0	19	12:00	4	116	25	3	8	1	0	0	3	0	1	0	1	162
0:15	0	10	1	0	0	0	0	0	0	0	0	0	0	11	12:15	1	120	18	2	8	2	0	0	3	0	0	0	0	154
0:30	0	10	1	0	2	2	0	0	0	0	0	0	0	15	12:30	4	132	21	5	9	3	0	4	2	0	1	0	1	182
0:45	0	7	0	0	1	0	0	0	0	0	0	0	0	8	12:45	0	98	21	3	4	2	0	2	4	0	0	0	3	137
1:00	0	8	0	0	1	0	0	0	0	0	0	0	0	9	13:00	3	130	16	1	7	3	0	2	2	0	0	0	1	165
1:15	0	3	1	0	0	1	0	0	0	0	0	0	0	5	13:15	4	127	26	1	8	2	0	1	2	0	0	0	1	172
1:30	0	5	0	0	0	1	0	0	0	0	0	0	0	6	13:30	0	130	29	6	16	3	0	2	2	0	0	1	0	189
1:45	0	9	0	0	0	0	0	0	1	0	0	0	0	10	13:45	2	151	27	2	17	5	0	2	2	0	0	0	0	208
2:00	0	4	1	0	2	1	0	0	0	0	0	0	0	8	14:00	0	142	32	1	10	1	0	1	4	0	0	2	1	194
2:15	0	6	1	0	2	0	0	0	1	0	0	0	0	10	14:15	2	161	24	5	18	6	0	1	3	1	1	0	1	223
2:30	0	11	2	0	1	0	0	0	0	0	0	0	0	14	14:30	6	187	24	1	9	3	0	0	2	1	0	0	1	234
2:45	0	10	1	0	1	0	0	0	0	0	0	0	0	12	14:45	2	188	32	1	10	3	1	2	3	0	0	0	2	244
3:00	0	6	1	0	0	1	0	0	0	0	0	0	0	8	15:00	4	206	36	2	15	1	1	0	1	0	0	0	1	267
3:15	0	5	1	0	1	0	0	0	1	0	0	0	0	8	15:15	1	176	28	2	8	2	2	1	2	0	0	1	0	223
3:30	0	7	4	0	0	0	0	0	1	0	0	0	0	12	15:30	0	190	21	0	10	5	1	2	2	0	0	0	0	231
3:45	0	13	4	0	0	0	0	0	0	0	0	0	0	17	15:45	2	192	24	1	12	5	0	0	1	0	0	0	1	238
4:00	0	18	1	1	2	0	0	1	0	0	0	0	0	23	16:00	3	200	32	0	8	2	0	2	3	0	0	0	0	250
4:15	0	29	11	1	0	0	0	0	1	0	0	0	0	42	16:15	4	194	34	1	17	3	3	1	2	0	0	0	1	260
4:30	0	56	6	0	1	0	0	0	2	0	0	0	0	65	16:30	2	253	29	2	6	1	1	0	3	0	0	2	1	300
4:45	0	53	12	0	2	1	0	0	2	1	0	0	0	71	16:45	2	199	28	1	10	6	0	1	0	0	0	1	1	249
5:00	0	43	12	0	5	0	0	1	1	0	0	0	0	62	17:00	7	266	32	3	11	5	0	0	1	0	1	0	0	326
5:15	0	54	14	1	6	2	0	0	1	0	0	1	1	80	17:15	2	204	23	1	12	4	0	1	1	0	0	0	1	249
5:30	0	83	15	0	9	4	1	1	1	0	1	0	0	115	17:30	0	230	26	0	9	5	0	1	1	0	0	0	0	272
5:45	3	97	26	2	8	1	1	0	0	0	0	0	0	138	17:45	2	204	22	0	5	2	0	1	1	0	0	0	1	238
6:00	1	83	15	3	9	4	1	0	2	0	0	0	1	119	18:00	4	216	23	0	1	1	0	0	1	0	0	0	0	246
6:15	1	83	21	1	1	3	0	0	0	0	0	0	0	110	18:15	4	199	19	0	8	2	1	0	0	0	0	0	0	233
6:30	2	125	25	3	2	3	0	3	1	0	0	0	0	164	18:30	1	169	23	0	4	2	0	1	0	0	0	0	0	200
6:45	2	175	29	2	8	5	0	0	2	0	0	0	1	224	18:45	2	143	14	1	2	2	0	0	1	0	0	1	0	166
7:00	3	211	26	3	9	6	1	0	3	2	0	1	0	265	19:00	1	158	21	0	3	2	0	0	0	0	0	0	0	185
7:15	1	160	33	1	7	5	0	0	0	0	1	2	0	210	19:15	2	116	14	0	5	2	0	0	0	0	0	0	0	139
7:30	1	152	18	0	10	6	1	0	1	0	1	1	1	192	19:30	1	140	14	0	3	0	0	0	0	0	0	0	0	158
7:45	0	160	22	2	10	4	0	0	3	0	0	0	0	201	19:45	0	119	17	1	2	0	0	0	0	1	0	0	0	140
8:00	0	169	23	4	6	3	1	0	3	0	1	0	1	211	20:00	1	155	13	0	2	1	0	1	0	0	0	0	0	173
8:15	1	164	18	1	9	6	0	1	2	0	0	1	1	204	20:15	0	119	10	0	3	0	0	0	0	0	0	0	0	132
8:30	1	137	17	0	9	3	0	2	2	0	0	0	0	171	20:30	1	94	18	0	3	1	0	0	0	0	0	0	0	117
8:45	0	128	19	2	6	4	0	1	2	1	1	0	0	164	20:45	0	99	12	0	4	0	0	0	0	0	0	0	0	115
9:00	0	90	18	1	5	5	0	1	2	0	0	0	0	122	21:00	0	88	5	0	2	2	0	0	0	0	0	0	0	97
9:15	0	79	33	2	6	4	0	1	4	0	0	0	0	129	21:15	0	76	10	1	2	2	0	0	0	0	0	0	0	91
9:30	1	101	22	2	9	3	0	0	3	1	0	0	0	142	21:30	1	70	3	0	1	0	0	0	0	0	0	0	0	75
9:45	0	92	25	3	8	0	0	1	5	0	0	0	0	134	21:45	0	70	12	0	2	0	0	0	0	0	0	1	0	85
10:00	0	81	13	0	13	3	0	4	3	0	0	0	1	118	22:00	0	58	9	0	3	1	0	0	0	0	0	0	0	71
10:15	0	99	21	1	12	3	1	2	3	0	0	0	1	143	22:15	1	53	3	0	2	0	0	0	1	0	0	0	0	60
10:30	0	83	12	3	5	3	1	0	3	2	0	0	0	112	22:30	0	43	3	0	1	2	0	0	0	0	0	0	0	49
10:45	3	109	21	3	4	2	0	2	2	0	1	0	0	147	22:45	0	31	2	0	0	0	0	0	0	0	0	0	0	33
11:00	1	96	29	3	13	3	1	3	0	0	1	0	1	151	23:00	0	24	3	0	1	1	0	0	0	0	0	0	0	29
11:15	0	96	26	4	7	4	1	4	1	0	1	0	1	145	23:15	0	23	1	0	0	1	0	0	0	0	0	0	0	25
11:30	0	108	26	4	8	2	0	2	4	0	0	0	1	155	23:30	0	19	3	0	0	1	0	0	1	0	0	0	0	24
11:45	2	100	22	1	10	2	0	2	1	2	0	0	1	143	23:45	0	20	3	0	0	1	0	0	0	0	0	0	0	24
TOTAL	23	3,443	652	54	230	101	10	32	64	9	8	6	12	4,644	TOTAL	76	6,498	885	47	301	99	10	29	54	3	4	9	19	8,034

AM PEAK HOUR	6:45 AM
AM PEAK VOLUME	891

PM PEAK HOUR	4:15 PM
PM PEAK VOLUME	1,135

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	99	9,941	1,537	101	531	200	20	61	118	12	12	15	31	12,678
% OF TOTAL	0.8%	78.4%	12.1%	0.8%	4.2%	1.6%	0.2%	0.5%	0.9%	0.1%	0.1%	0.1%	0.2%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Thursday, May 19, 2016 **Request ID** **Station ID** **Int Distance** **LOCATION#**
JOB #: SC0952 710 ADT2 Kimball east of El Prado

AM	EASTBOUND														PM	EASTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	17	1	0	0	0	0	1	1	0	0	0	0	20	12:00	3	47	11	2	2	0	0	0	3	0	2	0	1	71
0:15	0	19	3	2	0	0	0	0	1	0	0	0	0	25	12:15	3	58	9	2	5	4	0	2	4	0	2	0	0	89
0:30	0	11	0	0	1	0	0	0	3	0	0	0	0	15	12:30	1	67	11	1	6	0	0	0	3	0	1	0	1	91
0:45	1	10	1	1	1	1	0	0	0	0	0	0	0	15	12:45	4	66	10	2	3	2	0	1	8	0	1	0	1	98
1:00	0	7	0	3	4	0	0	0	2	0	0	0	0	16	13:00	1	75	5	5	3	0	0	1	2	2	0	0	1	95
1:15	0	7	0	2	3	1	0	0	2	0	0	0	0	15	13:15	0	77	5	4	8	1	0	4	1	0	0	0	1	101
1:30	0	3	1	5	0	0	0	0	2	0	0	0	0	11	13:30	4	86	5	4	5	2	1	0	1	0	2	0	1	111
1:45	0	12	1	2	0	1	0	0	1	0	0	0	0	17	13:45	1	91	7	1	6	1	1	2	7	0	0	0	1	118
2:00	0	10	0	1	0	1	0	0	0	0	0	0	0	12	14:00	0	88	8	0	5	2	1	1	2	1	0	0	0	108
2:15	0	9	0	0	0	0	0	0	3	0	0	0	0	12	14:15	2	75	4	1	7	0	0	2	2	0	0	1	3	97
2:30	1	6	0	1	0	2	0	0	3	0	0	0	0	13	14:30	0	136	5	4	7	2	0	0	1	0	0	0	2	157
2:45	0	11	1	0	0	0	0	0	3	1	0	0	0	16	14:45	1	116	8	0	9	1	0	0	3	0	0	1	0	139
3:00	0	8	2	0	0	2	0	0	3	0	0	0	0	15	15:00	1	111	15	0	7	2	1	0	3	1	0	1	1	143
3:15	0	5	0	0	0	3	0	0	3	0	0	0	0	11	15:15	0	114	14	2	9	3	0	1	3	0	0	0	0	146
3:30	0	7	2	0	0	0	0	0	4	0	0	0	0	13	15:30	2	133	16	0	4	3	0	4	2	1	0	1	4	170
3:45	0	7	2	0	0	1	0	0	0	1	0	0	0	11	15:45	4	119	15	0	4	1	2	1	1	0	3	0	3	153
4:00	0	11	2	0	1	0	0	0	1	0	0	0	0	15	16:00	0	126	11	1	6	2	0	1	5	1	0	0	5	158
4:15	0	11	0	0	0	1	0	0	2	0	0	0	0	14	16:15	0	135	16	0	4	1	2	0	3	0	0	1	1	163
4:30	0	32	2	1	0	0	0	0	0	0	0	0	1	36	16:30	4	154	13	0	4	4	1	1	2	0	0	0	0	183
4:45	0	42	1	0	1	0	0	0	2	0	0	0	0	46	16:45	2	163	15	0	3	3	0	0	3	0	0	1	1	191
5:00	0	19	1	0	2	0	0	0	4	0	0	0	0	26	17:00	0	179	22	0	2	0	0	1	0	0	0	1	0	205
5:15	0	29	3	0	0	0	0	0	2	0	0	0	0	34	17:15	2	180	12	0	6	7	0	0	2	0	0	1	2	212
5:30	0	54	3	1	2	0	0	0	0	0	0	0	0	60	17:30	2	191	13	0	4	2	0	0	1	0	2	0	0	215
5:45	2	80	5	0	1	2	0	0	3	0	0	0	0	93	17:45	2	182	13	0	5	3	0	0	1	0	0	0	2	208
6:00	0	37	5	1	3	1	0	2	1	0	0	0	0	50	18:00	1	176	9	0	2	2	1	1	1	0	0	0	0	193
6:15	0	30	7	1	4	2	0	1	1	0	0	0	0	46	18:15	2	180	9	0	2	1	0	0	2	0	0	1	0	197
6:30	2	74	7	1	0	3	0	0	1	0	0	0	0	88	18:30	0	160	11	0	3	1	0	1	0	1	0	0	0	177
6:45	1	91	9	0	2	1	1	3	2	0	0	0	0	110	18:45	0	135	4	0	2	0	0	2	0	0	0	0	0	143
7:00	1	94	8	2	3	3	2	0	5	0	0	1	0	119	19:00	1	125	3	0	0	2	0	1	1	0	0	1	0	134
7:15	0	101	12	0	5	4	1	1	3	1	0	0	1	129	19:15	0	109	9	0	1	2	1	3	0	0	0	0	0	125
7:30	0	109	13	0	8	2	0	2	1	0	1	0	0	136	19:30	0	98	9	0	2	2	0	0	4	0	0	0	0	115
7:45	0	125	9	0	2	2	0	1	4	0	0	0	0	143	19:45	1	115	7	0	4	0	0	2	2	0	1	0	0	132
8:00	1	107	4	0	1	1	0	0	4	0	0	0	1	119	20:00	3	108	4	0	3	0	0	0	2	0	0	1	1	122
8:15	0	91	3	1	4	0	0	0	5	1	1	1	0	107	20:15	0	115	2	0	2	1	0	0	2	0	0	0	0	122
8:30	1	79	5	1	1	1	0	1	1	0	0	0	1	91	20:30	1	80	5	0	2	3	0	1	4	0	0	1	0	97
8:45	0	77	1	1	2	1	0	1	3	0	0	2	0	88	20:45	0	107	8	0	2	2	0	0	2	0	0	0	0	121
9:00	1	60	7	0	5	3	0	0	4	1	0	1	2	84	21:00	0	82	5	0	1	1	0	2	3	0	0	0	0	94
9:15	1	31	3	0	2	2	0	1	1	0	1	0	0	42	21:15	1	75	1	0	1	2	0	2	2	1	1	0	1	87
9:30	1	39	1	0	3	0	0	3	5	0	0	0	1	53	21:30	3	68	4	0	2	0	0	1	6	0	0	0	1	85
9:45	0	39	5	2	3	3	0	3	3	0	0	0	0	58	21:45	0	64	2	0	1	1	0	1	4	1	0	0	1	75
10:00	2	46	9	1	4	2	0	4	3	0	0	0	1	72	22:00	2	55	6	0	1	1	0	0	1	0	1	0	1	68
10:15	0	37	6	0	4	0	0	2	5	1	0	0	1	56	22:15	0	62	3	0	1	0	0	2	1	0	0	0	1	70
10:30	4	38	2	3	4	3	1	1	6	0	1	0	1	64	22:30	0	31	4	0	0	1	0	0	2	0	0	0	0	38
10:45	0	45	6	4	2	0	1	1	4	1	0	0	1	65	22:45	0	28	2	0	0	1	0	0	1	0	0	0	0	32
11:00	3	53	7	5	0	2	0	2	5	0	1	0	0	78	23:00	0	28	0	1	0	0	0	2	1	0	0	0	0	32
11:15	2	58	4	3	6	1	0	0	4	0	0	0	1	79	23:15	0	26	0	0	0	0	0	0	1	0	0	0	0	27
11:30	1	53	6	0	2	3	1	1	6	0	0	0	1	74	23:30	0	15	3	0	0	0	0	0	1	0	0	0	1	20
11:45	0	48	9	0	2	0	1	0	4	0	0	0	1	65	23:45	0	16	1	0	1	0	0	0	0	0	0	0	0	18
TOTAL	25	1,989	179	45	88	55	8	31	126	7	5	5	14	2,577	TOTAL	54	4,827	374	30	157	69	11	43	106	9	16	12	38	5,746
										AM PEAK HOUR				7:15 AM										PM PEAK HOUR				5:00 PM
										AM PEAK VOLUME				527										PM PEAK VOLUME				840

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	79	6,816	553	75	245	124	19	74	232	16	21	17	52	8,323
% OF TOTAL	0.9%	81.9%	6.6%	0.9%	2.9%	1.5%	0.2%	0.9%	2.8%	0.2%	0.3%	0.2%	0.6%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
TOTAL: ALL	132	14,041	1,352	163	600	221	25	192	456	19	27	28	59	17,315
% OF TOTAL	1.6%	168.7%	16.2%	2.0%	7.2%	2.7%	0.3%	2.3%	5.5%	0.2%	0.3%	0.3%	0.7%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Thursday, May 19, 2016 **Request ID** ### **Station ID** ### **Distance Feet** 710 **LOCATION#** ADT2 Kimball east of El Prado

JOB #:

AM	WESTBOUND														PM	WESTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	7	2	0	0	1	0	0	1	0	0	0	0	11	12:00	0	100	12	0	2	2	0	1	3	0	1	0	0	121
0:15	0	4	0	0	0	0	0	1	0	0	0	0	0	5	12:15	0	87	8	1	7	2	0	0	5	0	0	1	1	112
0:30	0	13	1	0	0	0	0	0	0	0	0	0	0	14	12:30	1	64	15	3	1	1	0	3	5	1	0	0	0	94
0:45	0	18	0	0	0	0	0	0	1	0	0	0	0	19	12:45	0	62	11	2	4	2	0	1	7	0	0	0	0	89
1:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2	13:00	0	71	13	3	1	1	0	1	2	0	0	0	0	92
1:15	0	3	1	0	0	0	0	0	0	0	0	0	0	4	13:15	0	62	9	1	5	0	0	2	0	0	0	0	0	79
1:30	0	1	2	0	0	1	0	0	1	0	0	0	0	5	13:30	0	84	12	2	6	2	0	2	4	0	0	0	0	112
1:45	0	3	0	1	1	0	0	0	3	0	0	0	0	8	13:45	1	60	9	5	2	1	0	0	3	0	0	0	0	81
2:00	0	4	0	2	1	0	0	2	3	0	0	0	0	12	14:00	1	66	8	2	2	0	0	0	3	0	0	0	0	82
2:15	0	1	0	1	3	0	0	1	4	0	0	0	0	10	14:15	0	66	10	0	7	4	0	4	4	0	0	1	0	96
2:30	0	10	1	1	0	0	0	0	1	0	0	0	0	13	14:30	1	114	13	1	14	3	1	1	3	0	0	0	0	151
2:45	0	6	1	2	0	0	0	0	0	0	0	0	0	9	14:45	1	86	5	3	3	0	0	2	3	0	0	0	0	103
3:00	0	2	1	0	1	0	0	0	1	0	0	0	0	5	15:00	1	83	6	5	11	0	0	5	4	0	0	1	0	116
3:15	0	4	1	0	1	0	0	0	0	0	0	0	0	6	15:15	0	73	8	1	4	1	0	1	3	0	0	0	0	91
3:30	0	10	0	1	1	0	0	0	0	0	0	0	0	12	15:30	0	166	13	0	3	0	1	3	2	0	0	0	0	188
3:45	0	15	2	0	0	4	0	0	2	0	0	0	0	23	15:45	1	94	13	2	2	1	0	3	2	0	0	0	0	118
4:00	0	24	3	0	1	1	0	0	4	0	0	0	0	33	16:00	1	93	12	0	2	1	0	1	1	0	0	0	0	111
4:15	1	28	7	0	6	1	0	0	1	0	1	0	0	45	16:15	2	118	4	2	5	4	0	1	0	0	0	0	0	136
4:30	0	50	13	0	2	0	0	0	2	0	1	0	0	68	16:30	0	153	15	0	3	1	0	2	2	0	0	0	0	176
4:45	0	78	13	0	5	1	0	3	4	0	0	0	0	104	16:45	0	134	5	0	3	2	0	2	2	0	0	0	0	148
5:00	1	97	22	0	7	2	0	1	3	0	1	0	0	134	17:00	2	138	7	1	4	4	0	0	0	0	0	0	0	156
5:15	2	148	33	1	4	2	0	0	1	0	0	1	0	192	17:15	1	131	10	1	4	2	0	1	3	0	0	0	0	153
5:30	0	150	28	0	14	2	0	2	3	0	0	0	0	199	17:30	1	126	9	0	5	1	0	2	0	0	0	0	0	144
5:45	0	188	23	1	10	6	1	2	3	0	0	1	0	235	17:45	1	112	9	1	4	0	0	2	2	0	0	0	0	131
6:00	1	180	23	1	6	2	0	1	3	0	0	0	0	217	18:00	1	100	4	0	4	0	0	1	2	0	0	0	0	112
6:15	2	174	24	2	8	1	0	0	8	1	0	0	0	220	18:15	0	80	7	1	5	0	0	2	3	0	0	0	0	98
6:30	1	170	16	0	11	4	0	0	4	0	0	0	0	206	18:30	0	81	6	1	2	1	0	1	1	0	0	0	0	93
6:45	4	184	20	3	15	3	0	2	1	0	1	1	2	236	18:45	0	65	6	1	4	1	1	2	1	0	0	0	0	81
7:00	3	171	16	1	10	1	0	5	0	0	0	0	1	208	19:00	0	40	3	0	1	0	0	3	0	0	0	1	0	48
7:15	2	193	19	1	7	0	0	3	3	0	0	0	0	228	19:15	1	49	7	0	1	1	0	0	2	0	0	0	0	61
7:30	1	196	17	0	11	2	1	1	1	0	0	2	1	233	19:30	0	45	7	0	2	1	0	3	0	0	0	0	0	58
7:45	2	232	22	1	6	2	0	1	0	0	0	1	1	268	19:45	0	45	2	0	3	0	0	0	2	0	0	0	0	52
8:00	2	196	14	1	10	1	0	2	3	0	0	0	0	229	20:00	0	48	6	0	2	0	0	1	0	0	0	0	0	57
8:15	0	213	13	3	5	1	1	1	2	0	0	0	0	239	20:15	0	29	3	0	2	0	0	1	3	0	0	0	0	38
8:30	0	177	13	0	4	2	0	2	4	1	0	0	0	203	20:30	0	26	5	1	0	0	0	1	4	0	0	0	0	37
8:45	2	145	15	3	9	1	0	2	3	0	1	0	0	181	20:45	0	36	2	0	0	0	0	0	1	0	0	0	0	39
9:00	3	113	9	1	6	1	0	0	6	0	0	0	0	139	21:00	1	28	2	0	0	1	0	1	2	0	0	0	0	35
9:15	1	112	8	1	5	0	0	1	3	0	0	0	0	131	21:15	0	27	0	0	1	1	0	2	2	0	0	0	0	33
9:30	1	67	15	2	3	1	0	3	4	0	0	1	0	97	21:30	0	8	0	0	0	0	0	0	1	0	0	0	0	9
9:45	3	80	10	1	5	0	0	1	2	0	0	0	0	102	21:45	0	14	2	0	1	1	0	2	2	0	0	0	0	22
10:00	0	75	8	0	5	2	0	4	6	0	0	0	0	100	22:00	0	10	3	0	0	0	0	1	4	0	0	0	0	18
10:15	1	78	6	2	4	0	0	1	2	0	0	0	0	94	22:15	0	6	0	0	1	1	0	1	5	0	0	0	0	14
10:30	1	66	12	2	3	1	0	1	3	0	0	0	0	89	22:30	1	17	3	0	0	0	0	2	3	0	0	0	0	26
10:45	0	76	7	2	9	0	0	2	2	0	0	0	1	99	22:45	0	9	1	0	0	0	0	0	3	0	0	0	0	13
11:00	0	74	10	2	7	0	0	1	7	0	0	0	0	101	23:00	0	17	0	0	0	1	0	1	2	0	0	0	0	21
11:15	0	67	13	2	4	2	0	1	3	0	0	0	0	92	23:15	0	8	0	0	1	0	0	1	0	0	0	0	0	10
11:30	0	70	17	4	3	1	0	1	3	0	0	0	0	99	23:30	0	28	4	0	2	0	0	1	0	0	0	0	0	35
11:45	0	82	9	3	5	4	0	2	7	0	0	0	0	112	23:45	0	9	0	0	1	0	0	1	0	0	0	0	0	11
TOTAL	34	4,057	490	48	218	53	3	50	118	2	5	7	6	5,091	TOTAL	19	3,168	309	40	137	44	3	68	106	1	1	4	1	3,901

AM PEAK HOUR	7:30 AM
AM PEAK VOLUME	969
PM PEAK HOUR	4:30 PM
PM PEAK VOLUME	633

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	53	7,225	799	88	355	97	6	118	224	3	6	11	7	8,992
% OF TOTAL	0.6%	80.3%	8.9%	1.0%	3.9%	1.1%	0.1%	1.3%	2.5%	0.0%	0.1%	0.1%	0.1%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Thursday, May 19, 2016
JOB #: SC0952

Request ID **Station ID** **Int Distance** 446

LOCATION# ADT3 Kimball west of Driveway

AM	EASTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	22	1	0	1	0	0	0	0	0	0	0	0	24
0:15	0	19	3	0	2	0	0	0	0	0	0	0	0	24
0:30	0	14	0	0	1	0	0	0	0	0	0	0	0	15
0:45	0	10	2	0	2	0	0	0	0	0	0	0	0	14
1:00	0	9	1	0	1	0	0	0	0	0	0	0	0	11
1:15	0	6	1	0	0	0	0	0	0	0	0	0	0	7
1:30	0	3	0	0	0	0	0	0	0	0	0	0	0	3
1:45	0	9	0	0	0	0	0	0	0	0	0	0	0	9
2:00	0	6	0	0	1	0	0	0	0	0	0	0	0	7
2:15	0	3	1	0	1	0	0	0	0	0	0	0	0	5
2:30	0	1	0	0	1	0	0	0	0	0	0	0	0	2
2:45	0	3	0	0	1	0	0	0	0	0	0	0	0	4
3:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	5	1	0	0	0	0	0	1	0	0	0	0	7
3:45	0	2	0	0	0	0	0	0	1	0	0	0	0	3
4:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
4:15	0	4	0	0	3	0	0	0	1	0	0	0	0	8
4:30	0	12	4	0	0	0	0	0	1	0	0	0	0	17
4:45	0	6	0	0	1	0	0	0	3	0	0	0	0	10
5:00	0	4	1	0	2	0	0	0	0	0	0	0	0	7
5:15	0	7	1	0	2	0	0	0	0	0	0	0	0	10
5:30	0	16	0	0	3	0	0	0	1	0	0	0	0	20
5:45	0	20	3	0	0	0	0	0	0	0	0	0	0	23
6:00	0	25	2	0	3	0	0	0	0	0	0	0	1	31
6:15	0	30	6	1	12	2	0	1	1	0	0	0	0	53
6:30	0	41	6	0	9	1	0	0	0	0	0	0	0	57
6:45	1	39	3	0	0	0	0	0	1	0	0	0	0	44
7:00	0	44	11	0	3	0	0	1	0	0	0	0	0	59
7:15	0	69	5	0	4	1	0	0	0	0	0	1	0	80
7:30	1	62	7	0	12	0	0	2	0	0	0	0	0	84
7:45	0	52	8	1	14	0	0	0	0	0	0	0	0	75
8:00	1	64	9	0	6	0	0	1	0	0	0	0	0	81
8:15	0	94	11	1	7	0	0	1	2	0	0	0	0	116
8:30	0	62	20	1	8	2	0	0	1	0	0	0	0	94
8:45	1	51	9	0	4	0	0	0	0	0	0	1	0	66
9:00	1	46	4	0	3	0	1	0	2	0	0	0	0	57
9:15	0	26	10	0	9	2	0	1	1	0	1	0	0	50
9:30	0	35	3	0	6	0	0	1	0	0	0	0	0	45
9:45	0	43	7	0	4	0	0	0	1	0	0	0	0	55
10:00	2	45	10	0	4	1	0	0	1	0	0	0	0	63
10:15	0	31	8	0	7	0	0	0	0	0	0	0	0	46
10:30	0	25	8	1	7	0	0	0	1	0	0	0	0	42
10:45	0	43	12	0	2	1	1	0	0	0	0	0	0	59
11:00	0	53	13	0	6	0	0	0	1	0	0	0	0	73
11:15	0	51	10	0	4	0	0	0	1	0	0	0	0	66
11:30	0	49	10	2	9	1	0	1	0	0	0	0	0	72
11:45	0	50	10	0	12	3	0	0	3	0	0	0	0	78
TOTAL	7	1,317	221	7	178	14	2	9	24	0	1	2	1	1,783

PM	EASTBOUND													
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
12:00	0	50	4	0	6	0	0	0	2	0	0	0	0	62
12:15	1	47	10	0	10	0	0	0	0	0	0	0	0	68
12:30	1	56	12	1	9	1	0	1	0	0	0	0	0	81
12:45	0	51	13	0	9	0	0	0	0	0	0	0	0	73
13:00	0	63	12	0	5	0	1	0	1	0	0	0	0	82
13:15	1	68	11	0	8	0	0	2	0	0	0	0	0	90
13:30	0	65	11	0	10	0	0	0	1	0	0	0	0	87
13:45	1	66	16	0	12	0	0	0	0	0	0	0	0	95
14:00	0	72	13	0	3	0	0	0	0	0	0	0	0	88
14:15	0	88	14	0	10	0	0	0	2	0	0	0	0	114
14:30	1	90	21	1	10	0	0	1	0	0	0	0	0	124
14:45	0	122	22	0	19	0	0	0	0	0	0	0	0	163
15:00	0	116	30	0	24	1	0	2	1	0	0	0	0	174
15:15	1	125	24	0	18	1	1	1	0	0	0	0	0	171
15:30	1	122	25	2	20	0	0	1	1	0	0	0	0	172
15:45	2	136	34	1	15	0	0	0	0	0	0	0	0	188
16:00	1	144	24	1	16	1	0	0	0	0	0	0	0	187
16:15	2	137	28	0	15	0	0	0	0	0	0	0	0	182
16:30	0	184	24	0	16	0	2	0	1	0	0	0	0	227
16:45	3	181	26	0	14	0	0	0	0	0	0	0	0	224
17:00	1	181	36	0	21	0	0	1	0	0	0	0	0	240
17:15	1	188	39	0	17	0	0	0	1	0	0	0	0	246
17:30	5	213	33	0	19	0	0	0	2	0	0	0	0	272
17:45	2	201	33	0	17	0	0	1	1	0	0	0	0	255
18:00	2	183	28	0	15	0	0	1	0	0	0	0	0	229
18:15	0	186	22	0	12	0	0	1	0	0	0	0	0	221
18:30	3	169	28	0	10	0	0	0	1	0	0	0	0	211
18:45	0	161	16	0	11	0	0	0	0	0	0	0	0	188
19:00	1	131	22	0	7	0	0	0	0	0	0	0	0	161
19:15	1	132	22	0	8	0	0	0	0	0	0	0	0	163
19:30	1	99	16	0	9	0	0	1	0	0	0	0	0	126
19:45	1	115	18	0	9	0	0	0	0	0	0	0	0	143
20:00	2	97	26	2	6	0	0	0	0	0	0	0	0	133
20:15	0	126	19	0	7	0	0	0	0	0	0	0	0	152
20:30	0	99	8	0	5	0	0	0	0	0	0	0	0	112
20:45	1	96	15	0	10	0	0	0	0	0	0	0	0	122
21:00	2	95	13	0	6	0	0	1	0	0	0	0	0	117
21:15	0	77	9	0	7	0	0	0	0	0	0	0	0	93
21:30	0	74	7	0	6	0	0	0	0	0	0	0	0	87
21:45	0	76	10	0	5	0	0	0	0	0	0	0	0	91
22:00	0	53	10	0	8	0	0	0	0	0	0	0	0	71
22:15	2	57	5	0	2	0	0	0	0	0	0	0	0	66
22:30	0	45	6	0	6	0	0	0	0	0	0	0	0	57
22:45	0	23	4	0	0	0	0	0	0	0	0	0	0	27
23:00	0	34	3	0	3	0	0	0	0	0	0	0	0	40
23:15	1	36	1	0	1	0	0	0	0	0	0	0	0	39
23:30	0	22	4	0	3	0	0	0	0	0	0	0	0	29
23:45	0	15	4	0	1	0	0	0	0	0	0	0	0	20
TOTAL	41	4,967	831	8	480	4	4	14	14	0	0	0	0	6,363

AM PEAK HOUR	7:45 AM
AM PEAK VOLUME	366
PM PEAK HOUR	5:00 PM
PM PEAK VOLUME	1,013

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	48	6,284	1,052	15	658	18	6	23	38	0	1	2	1	8,146
% OF TOTAL	0.6%	77.1%	12.9%	0.2%	8.1%	0.2%	0.1%	0.3%	0.5%	0.0%	0.0%	0.0%	0.0%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
TOTAL: ALL	84	12,643	1,825	42	1,255	50	6	36	70	1	5	3	4	16,024
% OF TOTAL	0.5%	78.9%	11.4%	0.3%	7.8%	0.3%	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Thursday, May 19, 2016 **Request ID** ### **Station ID** ### **Distance Feet** 446 **LOCATION#** ADT3 Kimball west of Driveway

JOB #:

AM	WESTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	1	1	0	1	0	0	0	0	0	0	0	0	3
0:15	0	0	0	0	1	0	0	0	0	0	0	0	0	1
0:30	0	3	1	0	0	0	0	0	0	0	0	0	0	4
0:45	0	3	1	0	0	0	0	0	0	0	0	0	0	4
1:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
1:15	0	3	0	0	0	0	0	0	0	0	0	0	0	3
1:30	0	0	0	0	1	0	0	0	0	0	0	0	0	1
1:45	0	2	0	0	1	0	0	0	0	0	0	0	0	3
2:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
2:15	0	3	0	0	0	0	0	0	0	0	0	0	0	3
2:30	0	1	0	0	1	0	0	0	0	0	0	0	0	2
2:45	0	3	0	0	2	0	0	0	0	0	0	0	0	5
3:00	0	4	0	0	2	0	0	0	0	0	0	0	0	6
3:15	0	4	0	0	1	0	0	0	0	0	0	0	0	5
3:30	0	12	0	0	0	1	0	0	0	0	0	0	0	13
3:45	0	11	2	0	2	0	0	0	0	0	0	0	0	15
4:00	0	13	2	0	2	0	0	0	1	0	0	0	0	18
4:15	0	21	3	0	7	0	0	0	0	0	0	0	0	31
4:30	0	39	9	0	9	0	0	1	0	0	1	0	0	59
4:45	0	76	4	0	13	0	0	0	1	0	0	0	0	94
5:00	1	103	14	0	19	0	0	0	0	1	0	0	0	138
5:15	4	131	23	0	23	0	0	0	1	0	0	0	0	182
5:30	0	144	15	0	17	1	0	0	0	0	0	0	1	178
5:45	0	180	22	0	16	0	0	0	2	0	0	0	0	220
6:00	2	158	22	0	14	0	0	0	1	0	0	0	0	197
6:15	2	182	21	0	20	0	0	0	0	0	0	0	1	226
6:30	0	172	26	1	17	1	0	1	0	0	0	0	0	218
6:45	0	222	16	0	18	0	0	0	2	0	0	0	0	258
7:00	0	197	22	0	21	0	0	0	0	0	0	0	0	240
7:15	1	191	20	0	16	0	0	0	0	0	0	0	0	228
7:30	1	203	20	1	12	1	0	0	1	0	0	0	0	239
7:45	1	203	22	1	14	0	0	0	0	0	0	0	0	241
8:00	0	201	13	0	16	1	0	0	0	0	2	0	0	233
8:15	1	188	17	0	14	3	0	0	1	0	0	0	0	224
8:30	0	201	20	0	12	0	0	0	0	0	0	0	1	234
8:45	1	144	22	2	7	0	0	0	1	0	0	0	0	177
9:00	2	117	8	1	12	1	0	1	0	0	0	0	0	142
9:15	1	106	13	2	11	0	0	1	0	0	0	0	0	134
9:30	1	77	14	0	9	1	0	0	2	0	0	0	0	104
9:45	1	92	12	1	12	0	0	1	1	0	1	0	0	121
10:00	1	74	4	0	3	0	0	0	2	0	0	0	0	84
10:15	0	82	10	0	8	1	0	0	0	0	0	0	0	101
10:30	0	59	9	0	6	1	0	1	0	0	0	0	0	76
10:45	0	60	15	1	11	0	0	1	0	0	0	0	0	88
11:00	0	73	10	1	9	0	0	0	1	0	0	0	0	94
11:15	0	57	5	1	9	1	0	0	0	0	0	0	0	73
11:30	1	61	8	0	4	2	0	0	1	0	0	0	0	77
11:45	1	61	9	3	8	1	0	0	0	0	0	0	0	83
TOTAL	22	3,940	456	15	402	16	0	7	18	1	4	0	3	4,884

PM	WESTBOUND													
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
12:00	0	77	10	1	4	2	0	0	0	0	0	1	0	95
12:15	0	62	9	0	5	1	0	0	2	0	0	0	0	79
12:30	1	46	11	1	7	0	0	0	2	0	0	0	0	68
12:45	0	37	15	1	5	1	0	2	1	0	0	0	0	62
13:00	0	52	15	0	5	0	0	0	0	0	0	0	0	72
13:15	0	50	6	0	5	1	0	0	1	0	0	0	0	63
13:30	0	47	11	0	9	1	0	0	1	0	0	0	0	69
13:45	0	50	12	0	4	1	0	0	0	0	0	0	0	67
14:00	0	50	8	2	5	1	0	0	0	0	0	0	0	66
14:15	0	53	8	0	5	0	0	0	0	0	0	0	0	66
14:30	0	74	11	1	10	2	0	0	1	0	0	0	0	99
14:45	0	59	8	0	6	0	0	1	0	0	0	0	0	74
15:00	0	73	5	0	7	0	0	0	1	0	0	0	0	86
15:15	1	75	16	0	7	1	0	1	0	0	0	0	0	101
15:30	1	119	18	0	6	1	0	0	0	0	0	0	0	145
15:45	0	74	9	2	9	1	0	1	0	0	0	0	0	96
16:00	0	63	7	1	6	1	0	0	0	0	0	0	0	78
16:15	1	94	7	0	3	0	0	0	1	0	0	0	0	106
16:30	1	87	10	0	5	0	0	0	0	0	0	0	0	103
16:45	2	89	6	0	1	0	0	1	0	0	0	0	0	99
17:00	0	75	7	0	3	2	0	0	0	0	0	0	0	87
17:15	0	104	8	1	5	0	0	0	0	0	0	0	0	118
17:30	0	91	11	0	3	0	0	0	0	0	0	0	0	105
17:45	0	80	12	1	7	0	0	0	1	0	0	0	0	101
18:00	2	51	3	0	5	0	0	0	1	0	0	0	0	62
18:15	0	85	9	0	6	0	0	0	0	0	0	0	0	100
18:30	0	71	8	0	6	0	0	0	0	0	0	0	0	85
18:45	0	49	9	0	6	0	0	0	0	0	0	0	0	64
19:00	0	41	4	0	2	0	0	0	1	0	0	0	0	48
19:15	2	48	2	1	3	0	0	0	0	0	0	0	0	56
19:30	0	50	5	0	4	0	0	0	0	0	0	0	0	59
19:45	0	27	6	0	4	0	0	0	0	0	0	0	0	37
20:00	2	26	5	0	2	0	0	0	0	0	0	0	0	35
20:15	0	29	4	0	2	0	0	0	0	0	0	0	0	35
20:30	0	22	4	0	4	0	0	0	0	0	0	0	0	30
20:45	1	33	2	0	1	0	0	0	0	0	0	0	0	37
21:00	0	24	5	0	1	0	0	0	1	0	0	0	0	31
21:15	0	33	1	0	4	0	0	0	0	0	0	0	0	38
21:30	0	26	1	0	1	0	0	0	0	0	0	0	0	28
21:45	0	23	2	0	3	0	0	0	0	0	0	0	0	28
22:00	0	14	0	0	3	0	0	0	0	0	0	0	0	17
22:15	0	19	2	0	1	0	0	0	0	0	0	0	0	22
22:30	0	15	1	0	2	0	0	0	0	0	0	0	0	18
22:45	0	11	1	0	0	0	0	0	0	0	0	0	0	12
23:00	0	10	1	0	2	0	0	0	0	0	0	0	0	13
23:15	0	6	1	0	1	0	0	0	0	0	0	0	0	8
23:30	0	16	1	0	0	0	0	0	0	0	0	0	0	17
23:45	0	9	0	0	0	0	0	0	0	0	0	0	0	9
TOTAL	14	2,419	317	12	195	16	0	6	14	0	0	1	0	2,994

AM PEAK HOUR	6:45 AM
AM PEAK VOLUME	965
PM PEAK HOUR	3:00 PM
PM PEAK VOLUME	428

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	36	6,359	773	27	597	32	0	13	32	1	4	1	3	7,878
% OF TOTAL	0.5%	80.7%	9.8%	0.3%	7.6%	0.4%	0.0%	0.2%	0.4%	0.0%	0.1%	0.0%	0.0%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Wednesday, May 18, 2016
JOB #: SC0952

Request ID	Station ID	Int Distance	LOCATION#
		410	ADT4 Euclid north of Edison

AM	EASTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	23	6	0	1	2	0	0	2	0	0	0	0	34
0:15	1	23	1	0	1	2	0	0	1	0	1	0	0	30
0:30	0	41	4	0	1	2	0	1	1	0	0	0	0	50
0:45	0	28	3	0	2	2	0	4	1	0	0	0	0	40
1:00	0	32	2	0	1	4	0	0	4	0	0	1	0	44
1:15	0	8	2	0	0	3	0	0	2	0	0	0	0	15
1:30	0	16	1	0	1	2	0	0	3	0	0	0	0	23
1:45	0	5	2	0	2	1	0	0	6	0	0	0	0	16
2:00	0	12	0	0	4	5	1	1	5	0	0	0	0	28
2:15	0	11	1	0	1	1	0	2	8	0	0	0	0	24
2:30	0	7	0	0	1	3	0	1	4	0	0	1	0	17
2:45	0	13	0	1	2	3	0	0	4	0	1	0	0	24
3:00	0	14	2	2	2	2	0	0	2	0	0	0	0	24
3:15	0	9	0	1	8	4	0	2	0	0	1	0	0	25
3:30	0	11	2	2	4	0	0	3	6	0	0	1	0	29
3:45	0	24	1	2	7	2	0	0	6	0	0	0	1	43
4:00	0	29	4	0	8	1	0	1	6	0	1	0	0	50
4:15	1	20	3	1	12	1	0	3	4	0	0	0	1	46
4:30	1	26	4	3	4	3	0	0	5	0	0	0	0	46
4:45	0	33	2	0	2	2	0	0	6	0	1	0	1	47
5:00	0	25	5	0	10	1	0	1	8	0	0	0	1	51
5:15	1	36	8	4	12	2	0	1	8	0	1	0	1	74
5:30	1	33	4	2	6	1	0	0	7	0	1	1	1	57
5:45	0	42	5	2	25	1	0	2	4	0	0	0	2	83
6:00	1	65	12	2	9	5	0	2	9	0	0	0	1	106
6:15	0	67	16	3	17	2	0	0	10	0	0	0	1	116
6:30	3	94	15	4	13	4	0	1	5	0	1	0	1	141
6:45	2	80	10	2	9	3	0	1	9	1	1	0	2	120
7:00	2	120	16	4	13	2	0	1	8	0	1	1	7	175
7:15	1	151	17	1	16	1	0	1	6	0	0	1	1	196
7:30	5	177	24	5	20	5	2	5	6	0	1	1	3	254
7:45	6	150	15	2	22	7	2	3	8	1	1	1	6	224
8:00	3	127	22	3	16	3	0	1	7	1	1	2	4	190
8:15	2	140	17	2	17	3	1	2	12	3	4	1	2	206
8:30	5	157	19	2	23	5	0	3	9	0	1	1	4	229
8:45	5	128	20	1	8	8	0	2	8	1	5	3	5	194
9:00	3	106	20	3	18	10	2	1	13	1	4	0	3	184
9:15	0	85	15	2	14	8	1	3	7	1	0	1	2	139
9:30	4	86	24	2	27	13	1	2	13	0	0	2	4	178
9:45	0	76	18	5	15	4	0	4	16	4	1	1	0	144
10:00	10	97	13	3	15	7	0	5	16	2	2	0	5	175
10:15	5	77	21	3	19	5	2	1	14	1	4	1	2	155
10:30	3	78	11	5	16	4	1	1	13	0	1	0	3	136
10:45	2	72	25	2	26	3	0	1	11	1	5	1	2	151
11:00	3	82	16	0	18	10	1	1	8	1	3	0	5	148
11:15	2	81	14	5	16	8	1	2	8	0	0	2	3	142
11:30	4	83	18	7	20	7	0	2	15	1	1	1	2	161
11:45	3	85	21	8	24	3	2	2	11	1	2	3	0	165
TOTAL	79	2,985	481	96	528	180	17	69	345	20	46	27	76	4,949

AM PEAK HOUR	7:30 AM
AM PEAK VOLUME	874

PM	EASTBOUND													
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
12:00	4	84	20	5	17	6	2	0	17	0	2	0	5	162
12:15	4	95	29	3	18	6	1	2	17	1	3	4	4	187
12:30	2	90	20	3	15	11	1	2	9	2	3	2	5	165
12:45	9	87	17	6	22	8	1	1	10	1	5	0	5	172
13:00	3	87	17	4	16	3	1	0	8	0	3	3	2	147
13:15	3	77	23	2	23	5	3	5	12	0	1	1	2	157
13:30	1	89	19	4	16	0	1	4	15	1	3	1	1	155
13:45	5	136	33	7	31	10	1	2	8	0	1	0	3	237
14:00	2	116	31	7	22	6	0	0	10	3	3	0	3	203
14:15	4	125	23	2	29	16	0	6	9	0	0	1	1	216
14:30	3	117	26	5	24	6	0	1	8	0	3	1	2	196
14:45	8	160	29	1	30	8	1	1	11	1	4	2	3	259
15:00	2	136	29	3	38	7	1	1	10	0	0	1	3	231
15:15	13	140	22	5	26	3	1	0	13	3	2	0	4	232
15:30	5	148	35	3	14	9	1	0	10	0	4	1	2	232
15:45	1	182	44	4	30	6	0	4	4	0	1	1	6	283
16:00	9	188	26	2	23	6	1	1	5	0	2	2	3	268
16:15	5	207	37	3	32	3	1	0	6	0	2	0	5	301
16:30	1	193	30	2	32	8	2	3	4	1	3	1	0	280
16:45	1	182	28	0	25	4	0	5	6	0	0	1	3	255
17:00	2	185	21	1	20	2	1	3	5	0	1	0	1	242
17:15	5	210	32	0	18	5	0	3	4	1	0	0	1	279
17:30	4	190	33	0	17	3	1	4	3	0	0	0	0	255
17:45	0	171	24	1	18	5	0	4	5	0	1	2	1	232
18:00	2	152	32	3	22	5	1	3	5	0	0	0	0	225
18:15	3	144	23	1	15	2	1	2	4	1	2	0	2	200
18:30	1	110	22	2	20	4	1	3	2	0	0	0	0	165
18:45	0	125	16	0	15	5	0	1	6	0	0	0	1	169
19:00	2	105	19	2	14	4	0	2	6	0	1	1	0	156
19:15	3	108	10	0	7	2	1	3	1	0	1	0	0	136
19:30	5	92	21	2	9	3	0	1	1	0	2	2	2	140
19:45	3	77	16	1	9	1	0	2	3	0	1	0	2	115
20:00	1	81	18	0	12	2	0	1	4	0	0	0	0	119
20:15	4	106	11	1	12	3	1	0	3	0	0	0	0	141
20:30	4	73	11	2	12	2	0	1	7	1	0	0	0	113
20:45	0	72	7	1	2	0	0	2	4	0	0	0	0	88
21:00	1	69	10	1	4	1	0	3	4	0	1	0	0	94
21:15	0	65	7	0	8	1	0	0	6	0	0	0	0	87
21:30	2	75	5	0	4	3	1	2	3	1	0	0	0	96
21:45	1	58	11	0	5	5	0	1	2	0	1	0	0	84
22:00	0	75	9	1	9	1	0	1	2	1	0	0	0	99
22:15	0	60	10	0	5	0	0	3	4	0	0	0	0	82
22:30	0	72	9	0	6	3	0	0	2	0	1	0	0	93
22:45	3	50	7	0	5	1	0	2	5	0	0	0	0	73
23:00	0	43	6	1	1	3	0	2	5	0	0	1	0	62
23:15	0	44	5	0	1	0	0	0	5	0	0	0	1	56
23:30	0	53	5	0	5	0	0	3	1	0	0	0	0	67
23:45	0	35	2	0	1	0	0	0	2	0	0	0	0	40
TOTAL	131	5,339	940	91	759	197	27	90	296	18	57	28	73	8,046

PM PEAK HOUR	3:45 PM
PM PEAK VOLUME	1,132

CLASS 1	Class 1 — Motorcycles	CLASS 8	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	CLASS 9	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	CLASS 10	6 or More Axles, Single Trailer
CLASS 4	Buses	CLASS 11	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	CLASS 12	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	CLASS 13	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	210	8,324	1,421	187	1,287	377	44	159	641	38	103	55	149	12,995
% OF TOTAL	1.6%	64.1%	10.9%	1.4%	9.9%	2.9%	0.3%	1.2%	4.9%	0.3%	0.8%	0.4%	1.1%	100.0%

Class	1	2	3	4	5	6	7	8	9	10	11	12	13	
TOTAL: ALL	439	16,497	2,781	353	1,954	745	105	342	1,263	95	190	129	317	25,210
% OF TOTAL	3.4%	126.9%	21.4%	2.7%	15.0%	5.7%	0.8%	2.6%	9.7%	0.7%	1.5%	1.0%	2.4%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Wednesday, May 18, 2016 **Request ID** ### **Station ID** ### **Distance Feet** 410 **LOCATION#** ADT4 Euclid north of Edison

JOB #:

AM	WESTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	12	2	0	0	1	0	1	3	0	0	0	0	19
0:15	0	16	1	0	0	2	0	1	2	0	0	0	0	22
0:30	0	9	1	0	0	3	0	0	0	0	0	0	0	13
0:45	0	16	2	0	1	0	1	0	4	0	0	0	0	24
1:00	0	13	1	0	0	2	0	0	1	0	0	0	0	17
1:15	0	6	2	2	0	1	0	1	2	0	0	0	0	14
1:30	0	11	2	0	0	2	0	1	3	0	0	0	0	19
1:45	0	9	1	0	0	1	0	2	4	0	0	0	0	17
2:00	0	12	0	0	1	1	0	0	5	0	0	0	0	19
2:15	0	9	0	0	2	1	0	1	5	0	0	0	0	18
2:30	0	14	4	0	2	1	0	0	5	0	0	0	0	26
2:45	0	16	1	0	0	1	0	1	2	0	1	0	0	22
3:00	0	12	4	0	0	1	0	1	5	0	0	0	0	23
3:15	0	15	3	0	0	2	0	0	9	1	0	0	0	30
3:30	0	29	6	0	3	1	0	0	6	1	0	0	0	46
3:45	1	37	8	1	0	5	0	3	3	0	0	0	0	58
4:00	1	27	3	0	3	3	0	0	6	0	1	0	0	44
4:15	2	58	15	0	1	1	0	1	4	0	0	0	1	83
4:30	1	94	19	1	8	3	0	3	4	0	0	1	0	134
4:45	1	93	19	2	9	4	0	2	3	1	0	0	1	135
5:00	0	75	22	0	5	2	0	3	8	1	3	0	1	120
5:15	6	92	23	1	12	5	0	1	8	1	3	3	2	157
5:30	8	123	27	2	15	5	5	5	8	3	3	1	4	209
5:45	0	140	30	3	17	9	2	1	10	2	0	0	7	221
6:00	3	94	21	3	12	1	1	3	7	3	2	1	2	153
6:15	5	118	32	1	19	7	3	3	11	0	1	1	5	206
6:30	5	167	29	2	15	4	3	3	6	1	4	1	4	244
6:45	6	150	31	4	16	11	2	2	9	2	0	0	5	238
7:00	1	107	13	0	16	5	0	2	7	1	2	3	3	160
7:15	4	134	24	5	13	7	1	1	5	0	3	2	4	203
7:30	8	146	30	4	7	12	1	2	9	0	1	2	3	225
7:45	3	144	26	4	9	3	1	5	8	2	2	1	1	209
8:00	6	136	22	0	7	8	1	1	11	3	3	1	5	204
8:15	8	135	15	4	10	5	2	1	11	2	2	2	4	201
8:30	4	122	17	5	15	4	2	3	10	0	3	2	6	193
8:45	0	102	28	2	15	6	1	4	18	1	1	1	2	181
9:00	0	92	23	4	16	6	1	0	10	0	1	0	3	156
9:15	0	110	20	1	12	3	1	2	16	2	2	3	4	176
9:30	2	76	21	2	11	6	0	4	12	1	0	3	0	138
9:45	1	89	16	5	10	2	0	2	13	2	1	3	3	147
10:00	3	75	19	3	13	7	1	2	12	0	2	1	1	139
10:15	4	107	24	5	9	7	0	4	8	0	2	1	3	174
10:30	6	85	12	3	12	4	1	4	14	1	3	1	4	150
10:45	1	85	14	1	9	5	1	4	17	0	2	1	3	143
11:00	3	86	19	2	9	6	0	1	10	0	1	3	1	141
11:15	3	82	18	5	10	5	2	2	10	1	1	0	1	140
11:30	4	95	14	3	13	5	1	2	14	1	3	0	5	160
11:45	4	71	18	5	8	3	0	6	6	1	0	1	2	125
TOTAL	104	3,546	702	85	365	189	34	91	364	34	53	39	90	5,696

AM PEAK HOUR	6:15 AM
AM PEAK VOLUME	848

PM	WESTBOUND													
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
12:00	3	83	19	5	8	2	1	6	6	0	1	2	6	142
12:15	2	106	22	3	7	5	1	5	14	4	0	0	1	170
12:30	3	96	16	6	8	14	0	3	7	1	1	2	4	161
12:45	1	90	22	2	12	3	0	3	10	1	0	0	4	148
13:00	1	101	13	6	14	5	1	4	6	0	2	2	1	156
13:15	4	102	20	5	10	4	1	5	14	0	2	0	6	173
13:30	3	119	19	5	9	2	2	0	12	0	1	1	6	179
13:45	4	119	18	6	11	1	0	3	14	1	3	0	0	180
14:00	1	96	17	2	9	5	2	1	18	0	1	0	3	155
14:15	7	111	17	5	9	3	1	2	12	1	1	1	5	175
14:30	6	131	21	1	10	7	2	1	1	2	0	2	5	189
14:45	7	140	22	2	14	4	2	6	8	2	0	1	2	210
15:00	4	115	25	3	9	6	1	1	12	0	4	1	4	185
15:15	6	109	23	2	15	8	1	3	10	2	1	1	4	185
15:30	2	132	27	3	9	8	4	3	5	1	0	0	8	202
15:45	7	132	17	3	10	8	1	0	9	2	0	0	2	191
16:00	3	128	18	2	4	7	0	3	3	0	1	1	3	173
16:15	5	138	24	2	8	3	0	2	8	0	1	2	4	197
16:30	5	160	27	1	10	4	0	5	8	1	1	0	1	223
16:45	7	170	19	2	8	8	0	0	6	0	1	1	0	222
17:00	6	145	17	1	12	5	0	2	3	0	1	1	0	193
17:15	6	181	28	0	7	6	0	1	5	1	0	1	2	238
17:30	3	165	15	1	6	7	1	1	4	0	0	0	2	205
17:45	2	154	12	0	7	5	1	2	4	1	0	1	1	190
18:00	2	163	12	0	9	4	0	2	5	0	0	3	1	201
18:15	8	119	16	2	0	6	2	6	7	1	1	5	1	174
18:30	3	102	10	0	7	7	0	0	1	1	2	1	0	134
18:45	1	95	5	2	3	2	1	2	3	0	1	1	2	118
19:00	3	85	15	1	5	4	0	2	1	0	0	0	0	116
19:15	2	108	14	1	11	5	0	1	2	0	0	0	0	144
19:30	0	88	7	0	4	3	1	1	3	0	0	0	0	107
19:45	3	79	17	0	3	4	0	2	5	0	1	0	0	114
20:00	0	70	8	1	6	2	0	0	0	0	0	0	0	87
20:15	4	97	14	1	3	3	0	2	5	0	0	1	0	130
20:30	0	93	8	2	3	1	0	1	1	0	0	0	0	109
20:45	0	65	12	0	5	0	1	2	0	0	0	1	0	86
21:00	0	57	3	0	4	0	0	0	2	0	0	0	0	66
21:15	0	80	9	1	3	1	0	1	3	0	0	0	0	98
21:30	0	57	4	1	3	0	0	1	2	0	2	0	0	70
21:45	0	32	5	0	0	0	0	2	5	0	0	0	0	44
22:00	0	44	3	0	1	1	0	1	4	0	2	0	0	56
22:15	0	31	3	0	4	0	0	1	4	1	0	0	0	44
22:30	1	35	5	0	0	1	0	1	1	0	0	1	0	45
22:45	0	25	3	0	0	2	0	0	1	0	0	1	0	32
23:00	0	17	2	1	0	1	0	0	2	0	1	0	0	24
23:15	0	22	1	0	1	1	0	1	0	0	0	0	0	26
23:30	0	25	2	0	0	0	0	0	1	0	1	1	0	30
23:45	0	15	2	0	1	1	0	1	1	0	1	0	0	22
TOTAL	125	4,627	658	81	302	179	27	92	258	23	34	35	78	6,519

PM PEAK HOUR	4:30 PM
PM PEAK VOLUME	876

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	229	8,173	1,360	166	667	368	61	183	622	57	87	74	168	12,215
% OF TOTAL	1.9%	66.9%	11.1%	1.4%	5.5%	3.0%	0.5%	1.5%	5.1%	0.5%	0.7%	0.6%	1.4%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Tuesday, April 26, 2016
JOB #: SC0916

Request ID **Station ID** **Int Distance** 589

LOCATION# ADT1 Euclid south of Kimball

AM	EASTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	1	15	1	0	2	0	0	0	0	0	0	0	0	19
0:15	0	11	1	0	1	3	0	0	0	0	0	0	0	16
0:30	0	23	7	0	0	0	0	0	0	0	0	0	0	30
0:45	0	13	1	1	1	0	0	0	0	0	0	0	0	16
1:00	1	12	4	0	0	2	0	0	1	0	0	0	0	20
1:15	0	22	9	0	1	1	0	0	0	0	0	0	0	33
1:30	0	19	5	1	4	0	0	0	0	0	0	0	0	29
1:45	0	5	2	0	0	0	0	1	1	0	0	0	0	9
2:00	1	1	1	0	0	1	0	1	3	0	0	1	0	9
2:15	0	6	0	0	1	0	0	0	0	0	1	0	0	8
2:30	1	10	1	1	1	3	0	1	0	0	0	0	0	18
2:45	0	9	2	1	1	0	0	0	0	0	0	0	0	13
3:00	0	5	0	0	2	0	0	0	0	0	0	0	0	7
3:15	1	11	2	0	0	1	0	0	1	0	0	0	0	16
3:30	0	5	4	4	1	0	0	0	2	0	0	0	0	16
3:45	1	10	3	1	1	0	0	1	1	0	0	0	0	18
4:00	0	9	4	0	3	0	0	0	2	0	0	0	0	18
4:15	1	15	7	0	4	2	0	0	3	0	0	0	0	32
4:30	0	15	4	2	3	0	0	0	1	0	0	0	1	26
4:45	0	20	8	1	4	1	0	0	2	0	0	0	0	36
5:00	0	9	8	0	4	0	0	0	1	0	0	0	0	22
5:15	1	16	12	3	6	0	0	1	5	0	0	0	1	45
5:30	1	33	10	2	12	0	0	0	3	1	0	0	0	62
5:45	1	30	16	1	18	1	0	1	3	0	0	0	0	71
6:00	2	40	20	2	12	2	0	0	2	0	0	0	0	80
6:15	0	42	27	0	12	1	0	1	2	0	1	0	0	86
6:30	2	54	26	1	20	0	0	0	1	0	1	0	2	107
6:45	0	63	33	2	22	3	0	1	2	0	1	0	0	127
7:00	3	83	25	0	14	3	0	1	4	1	1	0	0	135
7:15	4	95	41	2	17	2	0	0	0	0	1	1	1	164
7:30	4	98	41	2	22	3	0	2	0	0	0	1	0	173
7:45	6	74	40	3	24	1	2	2	5	0	2	1	3	163
8:00	5	79	51	2	23	5	0	1	2	0	1	1	1	171
8:15	2	82	40	2	18	5	1	0	0	2	1	1	2	156
8:30	4	80	54	2	26	4	1	3	4	0	1	0	2	181
8:45	3	84	42	0	24	7	0	1	5	1	1	0	0	168
9:00	2	77	38	4	19	3	1	0	1	0	1	0	0	146
9:15	5	64	28	4	15	4	0	1	3	0	0	0	0	124
9:30	4	51	32	3	12	6	0	0	2	0	0	0	0	110
9:45	6	57	24	1	17	10	0	0	4	0	0	1	0	120
10:00	1	38	14	1	24	3	0	0	3	0	1	0	0	85
10:15	4	64	14	2	22	2	1	0	6	0	0	0	1	116
10:30	1	63	19	0	12	0	1	2	6	0	1	0	1	106
10:45	0	41	15	1	12	2	0	1	5	0	0	0	1	78
11:00	4	64	25	1	11	2	0	0	5	0	0	0	2	114
11:15	1	55	9	0	23	1	0	1	4	0	2	0	1	97
11:30	0	46	15	2	15	0	0	1	6	1	0	0	0	86
11:45	0	57	17	2	17	1	2	1	7	0	0	0	0	104
TOTAL	73	1,875	802	57	503	85	9	25	108	6	17	7	19	3,586

AM PEAK HOUR	8:00 AM
AM PEAK VOLUME	676

PM	EASTBOUND													
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
12:00	1	80	14	3	17	6	0	2	13	0	0	0	1	137
12:15	2	48	20	1	16	0	1	3	5	0	0	2	1	99
12:30	0	56	13	6	13	1	0	1	10	0	0	0	2	102
12:45	2	69	13	2	13	4	1	2	5	0	2	0	2	115
13:00	1	59	14	2	20	3	0	0	8	0	0	1	2	110
13:15	3	54	15	2	15	1	1	1	8	0	0	1	0	101
13:30	2	64	18	2	22	1	1	1	4	1	2	0	0	118
13:45	2	76	13	3	8	2	0	2	9	0	0	1	1	117
14:00	1	80	17	1	24	1	0	4	4	0	1	1	1	135
14:15	3	85	25	2	21	4	1	1	4	0	1	0	2	149
14:30	2	116	20	1	27	4	0	5	9	2	0	0	2	188
14:45	1	92	23	3	27	2	0	4	4	1	1	1	1	160
15:00	3	95	26	1	27	3	0	2	5	1	0	0	2	165
15:15	1	95	21	1	24	3	0	1	5	0	1	0	2	154
15:30	2	145	33	2	24	3	0	2	4	1	0	0	2	218
15:45	2	118	30	1	28	4	0	1	5	2	0	2	0	193
16:00	1	105	18	2	20	2	1	1	4	0	0	0	1	155
16:15	2	119	26	0	30	3	0	1	6	0	1	0	0	188
16:30	2	133	30	3	23	3	1	1	2	0	1	1	1	201
16:45	5	121	14	0	22	2	1	2	3	1	0	0	1	172
17:00	0	130	22	0	17	0	0	0	5	0	1	0	0	175
17:15	1	119	26	0	17	4	0	1	2	0	1	1	0	172
17:30	1	106	25	1	19	4	1	2	1	0	1	1	2	164
17:45	3	105	23	0	17	6	0	0	0	0	0	1	3	158
18:00	0	114	22	0	16	2	0	0	5	0	1	0	0	160
18:15	1	106	13	0	11	3	1	1	1	0	1	2	0	140
18:30	3	92	16	0	13	3	0	1	0	0	0	0	0	128
18:45	0	92	11	1	15	1	0	0	0	0	0	0	0	120
19:00	0	75	8	0	7	2	0	1	1	0	0	1	0	95
19:15	0	66	13	0	7	0	0	1	1	0	0	0	1	89
19:30	1	97	16	0	11	0	0	1	4	0	0	2	0	132
19:45	0	69	7	1	3	1	0	0	0	0	0	0	0	81
20:00	0	54	3	0	3	0	0	1	0	0	0	0	0	61
20:15	1	50	10	1	6	0	0	0	2	0	0	0	0	70
20:30	3	55	7	0	2	0	0	0	0	0	0	0	0	67
20:45	0	57	5	0	4	0	0	1	2	0	0	0	0	69
21:00	1	33	3	0	2	0	0	0	1	0	0	0	0	40
21:15	0	28	8	0	2	0	0	1	1	0	0	0	0	40
21:30	1	33	6	0	1	0	0	0	2	0	1	0	0	44
21:45	0	34	1	0	1	0	0	2	1	0	1	1	0	41
22:00	0	37	3	0	2	2	0	1	2	0	0	0	0	47
22:15	0	22	7	0	0	0	0	1	3	0	0	0	0	33
22:30	0	40	7	0	2	1	0	0	2	0	0	0	0	52
22:45	0	27	4	0	0	2	0	1	3	0	0	1	1	39
23:00	0	26	3	0	2	0	0	0	1	0	0	0	0	32
23:15	0	22	1	0	1	0	0	0	1	0	0	0	0	25
23:30	0	25	5	0	1	0	0	0	0	0	0	0	0	31
23:45	0	14	2	0	3	0	0	2	2	0	0	0	0	23
TOTAL	54	3,538	680	42	606	83	10	55	160	9	17	20	31	5,305

PM PEAK HOUR	3:30 PM
PM PEAK VOLUME	754

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	127	5,413	1,482	99	1,109	168	19	80	268	15	34	27	50	8,891
% OF TOTAL	1.4%	60.9%	16.7%	1.1%	12.5%	1.9%	0.2%	0.9%	3.0%	0.2%	0.4%	0.3%	0.6%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
TOTAL: ALL	225	10,889	2,511	175	1,733	348	48	158	544	35	88	56	125	16,935
% OF TOTAL	2.5%	122.5%	28.2%	2.0%	19.5%	3.9%	0.5%	1.8%	6.1%	0.4%	1.0%	0.6%	1.4%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Tuesday, April 26, 2016 **Request ID** **Station ID** **Distance Feet** **LOCATION#**

JOB #: SC0916 589 ADT1 Euclid south of Kimball

AM	WESTBOUND														PM	WESTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	11	0	0	0	0	0	1	0	0	0	0	0	12	12:00	3	42	10	1	11	5	0	1	6	0	1	1	2	83
0:15	0	13	2	0	0	0	0	0	2	0	0	0	0	17	12:15	2	74	19	1	8	1	0	1	3	0	1	0	1	111
0:30	0	14	2	0	1	1	0	0	2	0	0	0	0	20	12:30	4	69	17	0	8	2	2	2	2	0	1	0	1	108
0:45	0	3	1	0	0	0	0	0	0	0	0	0	0	4	12:45	3	66	10	2	7	5	0	0	6	0	3	1	3	106
1:00	0	4	1	0	0	0	0	0	1	0	0	0	0	6	13:00	1	68	17	2	8	1	0	2	7	2	2	0	2	112
1:15	0	13	1	0	0	0	0	0	1	0	0	0	0	15	13:15	0	56	11	2	6	4	0	0	5	0	0	0	1	85
1:30	0	8	1	0	1	0	0	0	3	0	0	0	0	13	13:30	0	71	15	2	10	2	1	0	1	0	2	1	2	107
1:45	0	12	2	1	2	2	0	2	0	0	0	0	0	21	13:45	0	65	17	1	9	0	0	1	6	0	0	0	0	99
2:00	0	7	1	1	2	1	0	0	4	0	0	0	0	16	14:00	1	58	10	1	11	1	1	1	4	0	1	0	0	89
2:15	0	3	0	1	1	2	0	0	2	0	0	0	1	10	14:15	0	61	10	2	7	2	1	2	4	0	0	0	0	89
2:30	0	6	2	0	0	0	0	0	2	0	0	0	0	10	14:30	0	77	8	1	11	1	1	0	3	0	1	0	0	103
2:45	0	19	3	0	0	0	0	0	3	0	0	0	0	25	14:45	2	77	11	3	6	2	0	1	5	0	1	1	1	110
3:00	0	6	2	0	1	0	0	1	0	0	0	0	0	10	15:00	2	76	13	0	11	1	0	0	3	0	1	0	0	107
3:15	1	15	0	0	1	0	0	0	2	0	1	0	1	21	15:15	3	75	19	1	12	4	1	2	1	0	1	0	4	123
3:30	1	14	7	0	1	0	1	1	1	1	2	0	0	29	15:30	1	92	18	2	15	4	0	3	5	1	1	1	2	145
3:45	0	29	5	1	3	1	0	0	3	0	0	0	0	42	15:45	1	109	10	4	13	3	0	0	0	0	0	1	0	141
4:00	0	24	3	0	1	1	0	0	6	0	0	0	0	35	16:00	1	111	19	0	7	1	1	1	3	0	0	0	0	144
4:15	0	29	5	0	3	1	0	3	6	1	0	0	0	48	16:15	0	113	17	0	12	1	0	0	2	0	0	1	0	146
4:30	0	41	8	1	5	1	0	1	5	0	0	0	2	64	16:30	2	106	13	0	11	1	2	0	2	0	0	1	0	138
4:45	3	56	14	1	14	2	0	1	5	2	2	1	2	103	16:45	0	105	17	0	8	3	0	0	5	0	1	0	0	139
5:00	3	69	18	2	15	6	0	3	9	0	4	1	6	136	17:00	0	116	12	0	7	5	2	0	2	1	2	0	0	147
5:15	5	71	23	1	9	5	0	2	1	0	0	0	1	118	17:15	0	121	11	0	6	4	0	1	5	0	0	1	0	149
5:30	1	91	31	2	18	2	0	0	3	1	1	1	1	152	17:30	0	137	23	0	10	2	0	0	1	0	2	0	0	175
5:45	2	90	28	1	12	10	0	3	3	0	0	0	1	150	17:45	1	118	16	0	7	4	0	1	2	0	0	0	2	151
6:00	0	55	22	2	14	3	0	3	5	0	0	0	2	106	18:00	2	81	8	0	10	0	0	0	0	1	1	1	0	104
6:15	0	67	20	3	16	2	1	1	5	0	1	0	3	119	18:15	0	79	8	0	5	0	0	1	2	0	0	0	0	95
6:30	1	63	14	1	17	4	1	2	8	1	1	0	3	116	18:30	3	77	10	0	5	1	0	1	3	0	0	0	0	100
6:45	3	96	23	3	13	4	0	0	4	0	2	0	2	150	18:45	0	62	8	1	8	2	0	1	0	0	0	1	0	83
7:00	3	93	12	1	6	3	0	3	6	0	1	0	2	130	19:00	0	64	9	0	3	1	0	1	1	0	0	1	1	81
7:15	3	82	18	1	18	3	0	1	1	1	1	0	1	130	19:15	1	53	8	0	5	1	0	0	1	0	0	0	0	69
7:30	0	89	18	1	8	3	0	1	4	1	0	0	1	126	19:30	0	64	6	0	1	2	0	1	1	0	0	0	0	75
7:45	5	86	18	0	9	2	1	1	2	0	1	0	2	127	19:45	0	65	6	0	4	2	0	1	0	0	1	0	0	79
8:00	1	104	13	1	11	1	1	0	6	1	2	1	1	143	20:00	0	40	5	0	2	1	1	1	0	0	0	0	1	51
8:15	0	107	18	0	13	3	1	1	2	1	1	1	4	152	20:15	0	43	6	0	3	1	0	1	4	0	0	0	0	58
8:30	3	100	15	1	8	4	4	0	6	0	0	0	3	144	20:30	1	51	4	0	3	1	0	0	0	0	2	0	0	62
8:45	3	85	17	0	9	4	1	1	5	1	1	2	0	129	20:45	0	37	3	0	2	1	0	0	0	0	0	0	0	43
9:00	3	47	20	1	9	8	0	2	1	1	0	0	3	95	21:00	0	25	5	0	0	1	0	0	1	0	0	0	0	32
9:15	0	68	10	3	4	4	2	1	3	1	0	1	2	99	21:15	0	32	7	0	4	0	0	0	1	0	1	1	0	46
9:30	2	59	16	2	9	2	0	1	4	0	0	0	0	95	21:30	0	39	1	0	2	1	0	1	1	0	0	0	0	45
9:45	4	79	10	2	8	2	0	0	3	0	1	0	0	109	21:45	0	30	4	0	2	0	0	0	3	0	0	0	0	39
10:00	3	66	22	2	11	2	0	0	1	0	0	3	2	112	22:00	0	29	3	0	3	0	0	0	0	0	0	0	0	35
10:15	2	73	26	2	13	3	0	2	8	0	1	1	2	133	22:15	0	24	4	0	2	0	0	0	0	0	0	1	0	31
10:30	4	58	13	3	6	4	0	1	4	0	1	0	0	94	22:30	0	17	2	0	0	0	0	0	4	0	0	0	0	23
10:45	1	71	15	3	7	1	0	2	4	0	2	0	1	107	22:45	0	12	0	0	1	2	0	0	1	0	0	0	0	16
11:00	3	60	14	0	9	1	0	1	9	1	0	1	1	100	23:00	0	18	2	0	0	1	0	1	0	0	0	0	0	22
11:15	1	53	24	1	13	1	0	2	7	0	1	2	0	105	23:15	0	13	3	0	1	0	0	1	0	0	0	0	0	18
11:30	2	52	19	2	6	1	0	0	3	0	1	0	2	88	23:30	0	19	0	0	0	0	0	0	0	0	0	0	0	19
11:45	1	69	17	2	9	3	3	3	4	1	0	0	0	112	23:45	0	9	0	1	1	0	0	1	1	0	0	0	0	13
TOTAL	64	2,430	574	49	336	103	16	47	169	15	28	15	52	3,898	TOTAL	34	3,046	455	27	288	77	13	31	107	5	26	14	23	4,146

AM PEAK HOUR	8:00 AM
AM PEAK VOLUME	568

PM PEAK HOUR	5:00 PM
PM PEAK VOLUME	622

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	98	5,476	1,029	76	624	180	29	78	276	20	54	29	75	8,044
% OF TOTAL	1.2%	68.1%	12.8%	0.9%	7.8%	2.2%	0.4%	1.0%	3.4%	0.2%	0.7%	0.4%	0.9%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Tuesday, April 26, 2016 **Request ID** **Station ID** **Int Distance** **LOCATION#**
JOB #: SC0916 486 ADT3 Kimball east of Main

AM	EASTBOUND														PM	EASTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10	12:00	0	35	4	0	3	1	0	1	0	0	0	0	0	44
0:15	0	6	2	0	0	0	0	0	0	0	0	0	0	8	12:15	1	25	5	0	5	0	0	0	1	0	1	0	0	38
0:30	0	9	0	0	2	0	0	0	0	0	0	0	0	11	12:30	0	27	7	0	5	1	0	0	0	0	0	1	0	41
0:45	0	3	1	0	0	0	0	0	0	0	0	0	0	4	12:45	0	29	3	0	4	0	0	3	0	0	0	0	0	39
1:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4	13:00	0	25	6	0	2	0	0	0	0	0	0	0	0	33
1:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2	13:15	1	29	9	0	1	0	0	1	0	0	0	0	0	41
1:30	0	2	0	0	1	0	0	0	0	0	0	0	0	3	13:30	1	27	6	0	2	2	2	0	0	0	0	0	0	40
1:45	0	2	0	0	0	0	0	0	0	0	0	0	0	2	13:45	0	38	5	1	5	0	0	1	1	0	0	0	0	51
2:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5	14:00	0	44	10	1	8	0	0	2	0	0	0	1	0	66
2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14:15	0	56	9	0	9	1	0	1	1	0	1	0	0	78
2:30	0	4	0	0	0	0	0	0	0	0	0	0	0	4	14:30	0	86	15	0	15	0	0	3	0	0	0	1	0	120
2:45	0	2	0	0	0	0	0	0	1	0	0	0	0	3	14:45	0	50	12	1	9	1	0	2	0	0	0	1	0	76
3:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6	15:00	0	63	9	0	9	1	0	2	0	0	0	0	0	84
3:15	0	1	1	0	0	0	0	0	0	0	0	0	0	2	15:15	0	58	10	1	10	0	1	5	0	0	0	0	0	85
3:30	0	3	0	0	0	0	0	0	1	0	0	0	0	4	15:30	0	106	18	0	9	4	0	3	1	0	0	1	0	142
3:45	0	3	0	0	0	0	0	0	1	0	0	0	0	4	15:45	0	97	14	0	8	3	0	2	1	0	0	1	0	126
4:00	0	3	2	0	1	0	0	0	0	0	0	0	0	6	16:00	1	110	12	0	9	0	0	3	0	0	0	0	0	135
4:15	0	2	0	0	0	0	0	0	1	0	0	0	0	3	16:15	1	145	21	0	7	0	1	0	0	0	0	1	0	176
4:30	0	9	3	0	0	0	0	1	1	0	0	0	0	14	16:30	1	133	22	0	7	3	1	6	0	0	0	0	0	173
4:45	0	10	1	0	1	0	0	0	1	0	0	0	0	13	16:45	1	155	16	0	12	4	0	2	1	0	0	0	0	191
5:00	0	2	1	0	0	0	0	0	1	0	0	0	0	4	17:00	1	154	18	0	10	2	0	3	0	0	0	0	0	188
5:15	0	4	2	0	3	0	0	0	1	0	0	0	0	10	17:15	3	166	15	0	12	0	0	2	1	0	1	0	0	200
5:30	0	6	2	0	1	0	0	0	0	0	0	0	0	9	17:30	0	187	10	0	5	0	2	2	1	0	0	0	0	207
5:45	0	13	3	0	3	0	0	0	0	0	0	0	0	19	17:45	0	176	13	0	10	0	1	3	1	0	0	0	0	204
6:00	0	13	3	0	0	0	0	0	1	0	0	0	0	17	18:00	1	145	19	0	6	2	0	1	0	0	0	0	0	174
6:15	0	21	1	1	5	0	0	0	0	0	0	0	0	28	18:15	1	132	12	0	6	1	0	1	0	0	0	0	0	153
6:30	0	31	5	1	11	1	1	0	0	0	1	0	0	51	18:30	0	105	7	0	6	1	0	1	0	0	0	0	0	120
6:45	0	26	5	0	3	0	0	0	0	0	0	0	0	34	18:45	0	69	10	0	6	0	0	0	0	0	0	0	0	85
7:00	0	54	9	0	2	1	0	2	0	0	0	0	0	68	19:00	0	94	10	0	10	0	0	1	0	0	0	0	0	115
7:15	0	56	5	0	5	2	0	0	0	0	0	0	1	69	19:15	0	67	8	0	7	0	0	1	0	0	0	0	0	83
7:30	1	55	4	0	5	1	0	1	0	0	0	0	0	67	19:30	1	56	7	0	5	0	0	3	0	0	0	0	0	72
7:45	0	62	3	1	2	0	0	0	0	0	0	0	0	68	19:45	0	58	8	0	3	0	0	1	0	0	0	0	0	70
8:00	0	63	4	1	4	0	0	0	0	0	0	1	0	73	20:00	0	39	7	0	3	0	0	1	0	0	0	0	0	50
8:15	0	63	4	1	3	0	0	0	0	0	0	0	0	71	20:15	0	57	6	0	3	1	0	1	0	0	0	0	0	68
8:30	0	56	3	0	7	1	0	2	0	0	0	0	0	69	20:30	0	42	5	0	3	0	0	0	0	0	0	0	0	50
8:45	0	63	6	1	4	0	0	1	1	0	0	2	1	79	20:45	0	59	4	0	1	0	0	1	0	0	0	0	0	65
9:00	0	25	8	1	5	0	0	0	0	0	1	0	0	40	21:00	0	22	5	0	1	0	0	1	0	0	0	0	0	29
9:15	0	25	7	0	3	1	0	0	0	0	0	0	0	36	21:15	0	38	2	0	3	0	0	0	0	0	0	0	0	43
9:30	0	20	2	2	2	0	0	0	0	0	0	1	0	27	21:30	1	30	2	0	2	0	0	0	0	0	0	0	0	35
9:45	0	18	2	1	6	1	0	0	0	0	0	1	0	29	21:45	0	24	7	0	0	2	0	1	0	0	0	0	0	34
10:00	0	20	4	0	3	1	0	0	0	0	0	0	1	29	22:00	0	20	3	0	0	1	0	0	0	0	0	0	0	24
10:15	0	16	5	0	4	0	1	1	0	0	0	0	0	27	22:15	0	18	3	0	0	0	0	0	0	0	0	0	0	21
10:30	0	10	8	0	1	0	0	1	0	0	0	0	0	20	22:30	0	18	4	0	0	0	0	0	0	0	0	0	0	22
10:45	0	21	4	0	9	1	0	0	0	0	0	0	0	35	22:45	0	20	2	0	0	0	0	0	0	0	0	0	0	22
11:00	0	18	5	1	2	1	0	0	0	0	0	1	0	28	23:00	0	12	1	0	0	0	0	0	1	0	0	0	0	14
11:15	0	23	7	0	3	0	0	2	1	0	0	0	0	36	23:15	0	8	1	0	0	0	0	0	0	0	0	0	0	9
11:30	0	15	1	0	2	1	0	0	0	0	0	1	0	20	23:30	0	11	2	0	0	0	0	0	0	0	0	0	0	13
11:45	0	22	3	0	4	0	0	0	1	0	0	0	0	30	23:45	0	15	0	0	1	0	0	0	0	0	0	0	0	16
TOTAL	1	904	129	11	107	12	2	11	12	0	2	7	3	1,201	TOTAL	15	3,180	404	4	242	31	8	61	10	0	3	7	0	3,965
										AM PEAK HOUR				8:00 AM										PM PEAK HOUR				5:00 PM
										AM PEAK VOLUME				292										PM PEAK VOLUME				799

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	16	4,084	533	15	349	43	10	72	22	0	5	14	3	5,166
% OF TOTAL	0.3%	79.1%	10.3%	0.3%	6.8%	0.8%	0.2%	1.4%	0.4%	0.0%	0.1%	0.3%	0.1%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
TOTAL: ALL	28	8,926	1,182	31	637	87	17	83	46	0	5	28	3	11,073
% OF TOTAL	0.5%	172.8%	22.9%	0.6%	12.3%	1.7%	0.3%	1.6%	0.9%	0.0%	0.1%	0.5%	0.1%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

PREPARED BY: AimTD LLC pacific@aimtd.com 714 753 7888

DATE: Tuesday, April 26, 2016
JOB #: SC0916

Request ID	Station ID	Distance Feet	LOCATION#
		486	ADT3 Kimball east of Main

AM	WESTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
0:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2
0:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
0:45	0	2	0	0	0	0	0	0	0	0	0	0	0	2
1:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
1:15	0	1	0	0	0	0	0	0	1	0	0	0	0	2
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:15	0	1	0	0	1	0	0	0	0	0	0	0	0	2
2:30	0	1	0	0	0	0	0	0	1	0	0	0	0	2
2:45	0	3	0	0	0	0	0	0	0	0	0	0	0	3
3:00	0	4	2	0	1	0	0	0	0	0	0	0	0	7
3:15	0	5	0	0	0	0	0	0	0	0	0	0	0	5
3:30	0	4	0	0	0	0	0	0	0	0	0	0	0	4
3:45	0	10	3	0	0	0	0	0	0	0	0	0	0	13
4:00	0	18	3	0	3	0	0	0	1	0	0	0	0	25
4:15	0	18	5	0	4	0	0	0	0	0	0	0	0	27
4:30	1	37	7	0	4	0	0	0	2	0	0	0	0	51
4:45	0	68	15	0	5	0	0	0	3	0	0	0	0	91
5:00	0	103	18	0	5	0	0	1	1	0	0	0	0	128
5:15	0	146	25	0	12	0	0	1	1	0	0	0	0	185
5:30	0	180	28	0	10	1	0	0	1	0	0	0	0	220
5:45	1	149	14	0	11	2	0	0	1	0	0	0	0	178
6:00	0	144	26	1	8	0	0	0	2	0	0	0	0	181
6:15	1	134	28	0	13	0	0	0	0	0	0	0	0	176
6:30	0	157	21	0	7	0	0	0	1	0	0	0	0	186
6:45	1	183	23	0	9	1	0	0	0	0	0	0	0	217
7:00	0	152	22	0	10	1	0	0	0	0	0	0	0	185
7:15	0	133	18	0	9	0	0	0	1	0	0	0	0	161
7:30	0	171	17	0	9	1	0	0	0	0	0	1	0	199
7:45	0	137	18	2	3	1	0	0	0	0	0	0	0	161
8:00	0	141	18	0	3	1	0	0	0	0	0	0	0	163
8:15	0	127	12	0	5	1	1	0	0	0	0	1	0	147
8:30	0	112	10	0	8	1	2	0	0	0	0	1	0	134
8:45	0	91	9	0	4	1	3	0	0	0	0	0	0	108
9:00	0	79	8	0	3	2	0	0	0	0	0	1	0	93
9:15	0	74	12	1	3	0	0	0	0	0	0	1	0	91
9:30	0	75	8	0	0	0	0	0	0	0	0	0	0	83
9:45	0	87	11	0	1	1	0	0	1	0	0	1	0	102
10:00	0	44	5	1	6	3	0	1	0	0	0	0	0	60
10:15	1	62	7	1	1	1	0	0	0	0	0	0	0	73
10:30	0	64	5	0	5	2	0	0	0	0	0	1	0	77
10:45	0	47	8	0	4	0	0	0	0	0	0	0	0	59
11:00	1	39	7	0	1	1	0	0	0	0	0	0	0	49
11:15	0	31	7	1	3	0	0	0	0	0	0	1	0	43
11:30	0	36	5	1	2	1	0	0	0	0	0	0	0	45
11:45	0	34	6	0	3	1	0	0	0	0	0	0	0	44
TOTAL	6	3,111	431	8	177	23	6	4	16	0	0	8	0	3,790

PM	WESTBOUND													
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
12:00	0	36	4	1	5	3	0	0	0	0	0	1	0	50
12:15	0	30	9	0	2	0	0	1	1	0	0	0	0	43
12:30	1	30	9	1	2	1	0	0	1	0	0	0	0	45
12:45	0	42	5	1	3	1	0	0	0	0	0	1	0	53
13:00	0	45	11	0	5	2	0	1	0	0	0	0	0	64
13:15	0	24	4	0	6	1	0	0	1	0	0	0	0	36
13:30	0	39	9	1	2	1	0	1	0	0	0	0	0	53
13:45	0	43	5	1	2	0	0	0	0	0	0	1	0	52
14:00	0	34	9	0	6	1	0	0	2	0	0	0	0	52
14:15	0	43	9	0	3	1	0	0	0	0	0	0	0	56
14:30	0	58	7	0	4	1	0	0	0	0	0	1	0	71
14:45	0	40	2	0	5	1	0	0	0	0	0	0	0	48
15:00	0	67	10	0	3	1	0	0	0	0	0	0	0	81
15:15	0	62	8	0	5	2	0	0	0	0	0	1	0	78
15:30	1	62	6	0	4	1	0	1	0	0	0	0	0	75
15:45	0	58	7	1	7	0	0	0	0	0	0	1	0	74
16:00	0	62	8	0	5	1	0	0	0	0	0	0	0	76
16:15	0	61	6	0	2	1	0	1	0	0	0	0	0	71
16:30	0	62	4	0	1	0	0	0	0	0	0	0	0	67
16:45	1	58	3	1	2	0	0	0	0	0	0	0	0	65
17:00	0	54	1	0	1	1	0	0	0	0	0	0	0	57
17:15	1	55	7	0	4	0	0	1	0	0	0	0	0	68
17:30	1	56	6	0	3	1	0	1	0	0	0	0	0	68
17:45	0	59	4	0	3	0	0	0	0	0	0	0	0	66
18:00	0	51	9	0	3	0	0	0	0	0	0	0	0	63
18:15	0	51	8	0	3	0	0	0	0	0	0	0	0	62
18:30	0	46	4	0	1	0	1	0	0	0	0	0	0	52
18:45	0	37	7	0	2	0	0	0	0	0	0	0	0	46
19:00	0	29	4	1	1	0	0	0	1	0	0	0	0	36
19:15	0	33	3	0	1	0	0	0	0	0	0	0	0	37
19:30	1	28	1	0	3	0	0	0	0	0	0	0	0	33
19:45	0	33	8	0	2	0	0	0	0	0	0	0	0	43
20:00	0	29	0	0	0	0	0	0	0	0	0	0	0	29
20:15	0	34	5	0	1	0	0	0	0	0	0	0	0	40
20:30	0	22	1	0	2	0	0	0	0	0	0	0	0	25
20:45	0	24	0	0	3	0	0	0	1	0	0	0	0	28
21:00	0	21	1	0	0	0	0	0	0	0	0	0	0	22
21:15	0	14	4	0	1	0	0	0	0	0	0	0	0	19
21:30	0	23	2	0	1	0	0	0	0	0	0	0	0	26
21:45	0	16	3	0	1	0	0	0	0	0	0	0	0	20
22:00	0	18	1	0	1	0	0	0	0	0	0	0	0	20
22:15	0	12	0	0	0	0	0	0	0	0	0	0	0	12
22:30	0	4	0	0	0	0	0	0	0	0	0	0	0	4
22:45	0	7	0	0	0	0	0	0	0	0	0	0	0	7
23:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
23:15	0	5	0	0	0	0	0	0	0	0	0	0	0	5
23:30	0	6	2	0	0	0	0	0	1	0	0	0	0	9
23:45	0	3	0	0	0	0	0	0	0	0	0	0	0	3
TOTAL	6	1,731	218	8	111	21	1	7	8	0	0	6	0	2,117

AM PEAK HOUR	6:15 AM	PM PEAK HOUR	3:00 PM
AM PEAK VOLUME	764	PM PEAK VOLUME	308

CLASS 1	Class 1 — Motorcycles	CLASS 8	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	CLASS 9	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	CLASS 10	6 or More Axles, Single Trailer
CLASS 4	Buses	CLASS 11	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	CLASS 12	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	CLASS 13	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	12	4,842	649	16	288	44	7	11	24	0	0	14	0	5,907
% OF TOTAL	0.2%	82.0%	11.0%	0.3%	4.9%	0.7%	0.1%	0.2%	0.4%	0.0%	0.0%	0.2%	0.0%	100.0%

Class	1	2	3	4	5	6	7	8	9	10	11	12	13

APPENDIX 3.2:

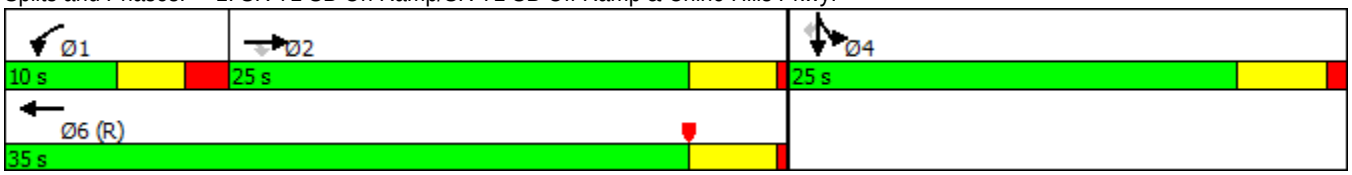
EXISTING (2016) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

This Page Intentionally Left Blank

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1151	305	6	917	461	82	384
Future Volume (vph)	1151	305	6	917	461	82	384
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.40	0.36	0.04	0.54	0.55	0.51	0.67
Control Delay	11.4	3.2	27.0	9.4	21.2	20.0	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	3.2	27.0	9.4	21.2	20.0	18.7
LOS	B	A	C	A	C	C	B
Approach Delay	9.7			9.5		19.8	
Approach LOS	A			A		B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1151	305	6	917	0	0	0	0	461	82	384
Future Volume (veh/h)	0	1151	305	6	917	0	0	0	0	461	82	384
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1187	244	6	945	0				536	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1187	244	6	945	0				536	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	8.3	6.6	0.2	8.5	0.0				7.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.3	6.6	0.2	8.5	0.0				7.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.46	0.38	0.47	0.54	0.00				0.50	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.78	0.78	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.6	12.1	29.6	6.2	0.0				16.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.4	7.4	1.0	0.0				1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	2.8	0.1	4.1	0.0				3.7	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.7	12.5	37.0	7.1	0.0				17.6	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1431			951						536	
Approach Delay, s/veh		12.7			7.3						17.6	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	10.3		9.9		10.5		
Green Ext Time (p_c), s	0.0	8.5		1.1		14.7		

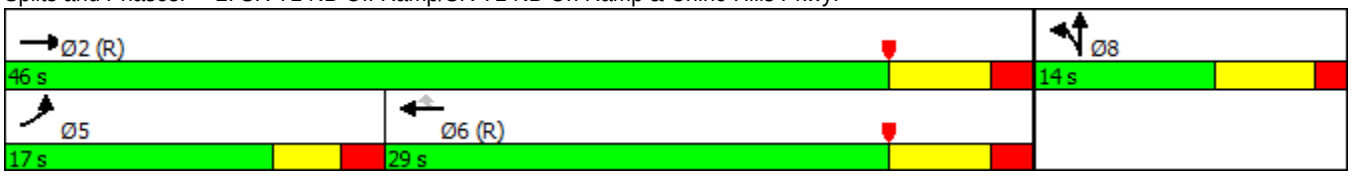
Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	537	1075	562	296	361	192
Future Volume (vph)	537	1075	562	296	361	192
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	17.0	46.0	29.0	29.0	14.0	14.0
Total Split (%)	28.3%	76.7%	48.3%	48.3%	23.3%	23.3%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	12.0	39.5	22.5	22.5	8.0	8.0
Actuated g/C Ratio	0.20	0.66	0.38	0.38	0.13	0.13
v/c Ratio	0.96	0.50	0.46	0.48	0.99	0.93
Control Delay	57.8	5.9	15.6	10.3	94.1	57.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	5.9	15.6	10.3	94.1	57.7
LOS	E	A	B	B	F	E
Approach Delay		23.2	13.8			69.7
Approach LOS		C	B			E

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	537	1075	0	0	562	296	361	192	9	0	0	0
Future Volume (veh/h)	537	1075	0	0	562	296	361	192	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	565	1132	0	0	592	311	395	181	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	591	2252	0	0	1282	564	432	231	8			
Arrive On Green	0.20	0.66	0.00	0.00	0.38	0.38	0.13	0.13	0.13			
Sat Flow, veh/h	2956	3510	0	0	3510	1505	3238	1732	57			
Grp Volume(v), veh/h	565	1132	0	0	592	311	395	0	187			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1505	1619	0	1790			
Q Serve(g_s), s	11.3	10.1	0.0	0.0	7.9	9.8	7.2	0.0	6.1			
Cycle Q Clear(g_c), s	11.3	10.1	0.0	0.0	7.9	9.8	7.2	0.0	6.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	591	2252	0	0	1283	564	432	0	239			
V/C Ratio(X)	0.96	0.50	0.00	0.00	0.46	0.55	0.91	0.00	0.78			
Avail Cap(c_a), veh/h	591	2252	0	0	1283	564	432	0	239			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.72	0.72	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.7	5.2	0.0	0.0	14.2	14.8	25.7	0.0	25.2			
Incr Delay (d2), s/veh	24.7	0.7	0.0	0.0	0.9	2.8	26.5	0.0	22.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.7	4.9	0.0	0.0	3.9	4.5	4.8	0.0	4.4			
LnGrp Delay(d),s/veh	48.4	6.0	0.0	0.0	15.0	17.6	52.2	0.0	47.4			
LnGrp LOS	D	A			B	B	D		D			
Approach Vol, veh/h		1697			903			582				
Approach Delay, s/veh		20.1			15.9			50.6				
Approach LOS		C			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		46.0			17.0	29.0		14.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		39.5			12.0	22.5		8.0
Max Q Clear Time (g_c+I1), s		12.1			13.3	11.8		9.2
Green Ext Time (p_c), s		15.5			0.0	8.0		0.0

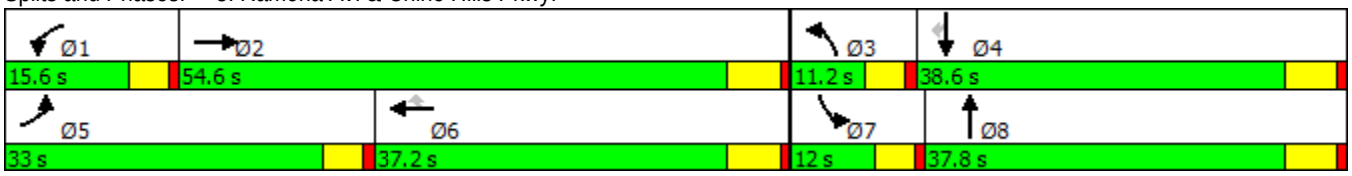
Intersection Summary	
HCM 2010 Ctrl Delay	24.5
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	340	740	65	591	90	26	384	76	174	241
Future Volume (vph)	340	740	65	591	90	26	384	76	174	241
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	27.3	48.2	8.7	27.4	27.4	6.0	32.1	7.3	37.6	37.6
Actuated g/C Ratio	0.24	0.42	0.08	0.24	0.24	0.05	0.28	0.06	0.33	0.33
v/c Ratio	0.93	0.38	0.56	0.76	0.20	0.33	0.59	0.78	0.16	0.38
Control Delay	76.4	24.3	69.8	47.6	1.8	64.8	36.6	99.8	30.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	24.3	69.8	47.6	1.8	64.8	36.6	99.8	30.8	6.0
LOS	E	C	E	D	A	E	D	F	C	A
Approach Delay		40.7		44.0			37.9		29.3	
Approach LOS		D		D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 39.1	Intersection LOS: D
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	740	4	65	591	90	26	384	144	76	174	241
Future Volume (veh/h)	340	740	4	65	591	90	26	384	144	76	174	241
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	358	779	3	68	622	78	27	404	84	80	183	158
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	2160	8	85	836	368	41	784	161	99	1074	472
Arrive On Green	0.24	0.43	0.43	0.05	0.24	0.24	0.03	0.28	0.28	0.06	0.31	0.31
Sat Flow, veh/h	1619	5053	19	1619	3420	1507	1619	2817	580	1619	3420	1504
Grp Volume(v), veh/h	358	505	277	68	622	78	27	244	244	80	183	158
Grp Sat Flow(s),veh/h/ln	1619	1638	1796	1619	1710	1507	1619	1710	1687	1619	1710	1504
Q Serve(g_s), s	25.0	12.0	12.0	4.8	19.3	4.7	1.9	13.8	14.1	5.6	4.5	9.3
Cycle Q Clear(g_c), s	25.0	12.0	12.0	4.8	19.3	4.7	1.9	13.8	14.1	5.6	4.5	9.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	381	1401	768	85	836	368	41	476	469	99	1074	472
V/C Ratio(X)	0.94	0.36	0.36	0.80	0.74	0.21	0.66	0.51	0.52	0.81	0.17	0.33
Avail Cap(c_a), veh/h	400	1401	768	155	934	411	93	476	469	104	1074	472
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	22.3	22.3	53.9	40.1	34.6	55.6	34.9	35.0	53.3	28.6	30.2
Incr Delay (d2), s/veh	28.8	0.2	0.4	6.4	3.3	0.4	6.7	3.9	4.1	32.2	0.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	5.4	6.0	2.3	9.5	2.0	0.9	7.0	7.0	3.4	2.2	4.1
LnGrp Delay(d),s/veh	72.0	22.5	22.7	60.3	43.4	35.0	62.3	38.8	39.1	85.5	28.9	32.1
LnGrp LOS	E	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1140			768			515			421	
Approach Delay, s/veh		38.1			44.0			40.2			40.9	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	55.0	7.5	41.9	31.7	33.9	11.6	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	6.8	14.0	3.9	11.3	27.0	21.3	7.6	16.1
Green Ext Time (p_c), s	0.0	16.0	0.0	4.3	0.1	6.7	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	40.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	751	93	27	630	105	31
Future Vol, veh/h	751	93	27	630	105	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	825	102	30	692	115	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	825	0	1230	413
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	-	-	4.1	-	7.5	6.9
Critical Hdwy Stg 1	-	-	-	-	6.5	-
Critical Hdwy Stg 2	-	-	-	-	6.5	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	814	-	136	594
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	814	-	132	594
Mov Cap-2 Maneuver	-	-	-	-	295	-
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	577	-

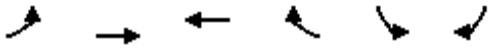
Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	24.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	333	-	-	814	-
HCM Lane V/C Ratio	0.449	-	-	0.036	-
HCM Control Delay (s)	24.3	-	-	9.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.2	-	-	0.1	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	212	569	562	64	94
Future Volume (vph)	212	569	562	64	94
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	92.0	50.0	28.0	42.0
Total Split (%)	35.0%	76.7%	41.7%	23.3%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	15.8	42.8	22.3	22.6	39.6
Actuated g/C Ratio	0.20	0.55	0.29	0.29	0.51
v/c Ratio	0.70	0.33	0.66	0.08	0.12
Control Delay	40.9	9.4	27.7	23.9	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	9.4	27.7	23.9	2.5
LOS	D	A	C	C	A
Approach Delay		17.9	27.7	11.2	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 77.2	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 52.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	212	569	562	30	64	94
Future Volume (veh/h)	212	569	562	30	64	94
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	230	618	611	33	70	27
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	269	1930	1118	60	846	692
Arrive On Green	0.17	0.56	0.34	0.34	0.29	0.29
Sat Flow, veh/h	1619	3510	3390	178	2956	1530
Grp Volume(v), veh/h	230	618	316	328	70	27
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1769	1478	1530
Q Serve(g_s), s	10.7	7.5	11.6	11.7	1.3	0.8
Cycle Q Clear(g_c), s	10.7	7.5	11.6	11.7	1.3	0.8
Prop In Lane	1.00			0.10	1.00	1.00
Lane Grp Cap(c), veh/h	269	1930	579	599	846	692
V/C Ratio(X)	0.85	0.32	0.55	0.55	0.08	0.04
Avail Cap(c_a), veh/h	781	3800	974	1008	846	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	9.0	20.8	20.8	20.2	11.8
Incr Delay (d2), s/veh	3.0	0.1	1.1	1.1	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	3.6	5.6	5.8	0.6	0.9
LnGrp Delay(d),s/veh	34.4	9.1	22.0	21.9	20.4	11.9
LnGrp LOS	C	A	C	C	C	B
Approach Vol, veh/h		848	644		97	
Approach Delay, s/veh		16.0	21.9		18.1	
Approach LOS		B	C		B	

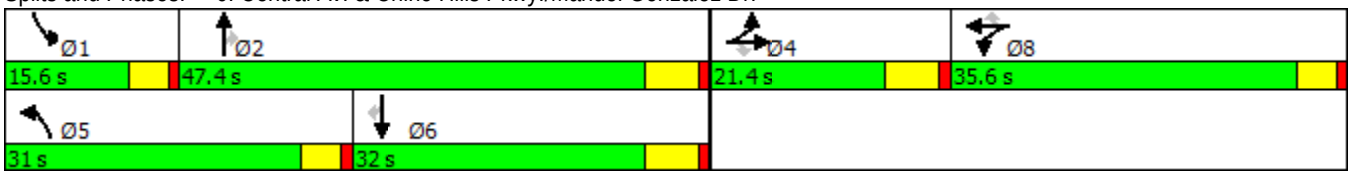
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		49.6		28.0	17.5	32.1		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		86.2		22.2	37.4	44.2		
Max Q Clear Time (g_c+I1), s		9.5		3.3	12.7	13.7		
Green Ext Time (p_c), s		15.8		0.2	0.3	12.6		

Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	50	191	2	3	7	314	790	43	62	639	245
Future Volume (vph)	295	50	191	2	3	7	314	790	43	62	639	245
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.6	15.6	15.6	13.5	13.5	13.5	24.8	46.1	46.1	7.9	26.9	26.9
Actuated g/C Ratio	0.17	0.17	0.17	0.15	0.15	0.15	0.27	0.50	0.50	0.09	0.29	0.29
v/c Ratio	0.72	0.68	0.48	0.01	0.01	0.02	0.79	0.50	0.06	0.48	0.70	0.46
Control Delay	56.2	52.6	10.4	35.5	35.3	0.1	47.7	20.7	0.1	56.0	36.1	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	52.6	10.4	35.5	35.3	0.1	47.7	20.7	0.1	56.0	36.1	12.9
LOS	E	D	B	D	D	A	D	C	A	E	D	B
Approach Delay		38.7			13.7			27.3			31.4	
Approach LOS		D			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 92.1	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 31.0	Intersection LOS: C
Intersection Capacity Utilization 68.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	295	50	191	2	3	7	314	790	43	62	639	245
Future Volume (veh/h)	295	50	191	2	3	7	314	790	43	62	639	245
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	360	0	112	2	3	3	341	859	35	67	695	211
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	461	0	218	33	37	31	378	1792	785	83	1168	516
Arrive On Green	0.14	0.00	0.14	0.02	0.02	0.02	0.23	0.52	0.52	0.05	0.34	0.34
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	360	0	112	2	3	3	341	859	35	67	695	211
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	8.5	0.0	5.4	0.1	0.1	0.2	16.2	12.7	0.9	3.3	13.3	8.5
Cycle Q Clear(g_c), s	8.5	0.0	5.4	0.1	0.1	0.2	16.2	12.7	0.9	3.3	13.3	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	461	0	218	33	37	31	378	1792	785	83	1168	516
V/C Ratio(X)	0.78	0.00	0.51	0.06	0.08	0.10	0.90	0.48	0.04	0.81	0.60	0.41
Avail Cap(c_a), veh/h	636	0	301	632	703	597	538	1792	785	224	1168	516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	31.5	38.1	38.2	38.2	29.5	12.0	9.2	37.3	21.6	20.0
Incr Delay (d2), s/veh	4.2	0.0	1.9	0.8	0.9	1.3	11.3	0.9	0.1	6.7	2.2	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	2.4	0.0	0.1	0.1	8.4	6.2	0.4	1.6	6.6	3.9
LnGrp Delay(d),s/veh	37.1	0.0	33.4	38.9	39.1	39.5	40.8	12.9	9.3	44.0	23.8	22.4
LnGrp LOS	D		C	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		472			8			1235			973	
Approach Delay, s/veh		36.2			39.2			20.5			24.9	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	47.4		17.1	23.2	32.9		6.2
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.3	14.7		10.5	18.2	15.3		2.2
Green Ext Time (p_c), s	0.0	17.2		0.8	0.3	8.6		0.0

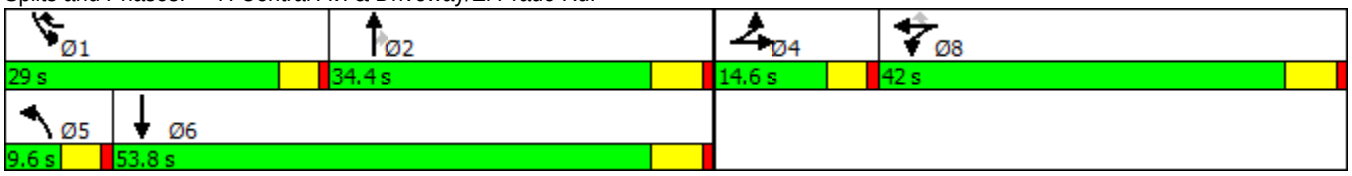
Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	890	3	435	2	738	513	307	603
Future Volume (vph)	1	1	890	3	435	2	738	513	307	603
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	0.96	0.91	0.46	0.03	0.91	0.70	0.94	0.27
Control Delay	48.0	41.0	68.2	58.1	6.1	53.0	53.7	8.1	76.2	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	68.2	58.1	6.1	53.0	53.7	8.1	76.2	16.2
LOS	D	D	E	E	A	D	D	A	E	B
Approach Delay		43.3		44.5			35.0			36.2
Approach LOS		D		D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 38.9	Intersection LOS: D
Intersection Capacity Utilization 88.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	890	3	435	2	738	513	307	603	9
Future Volume (veh/h)	1	1	1	890	3	435	2	738	513	307	603	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	991	0	340	2	820	401	341	670	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1047	0	833	4	886	391	358	2390	29
Arrive On Green	0.01	0.01	0.01	0.32	0.00	0.32	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5006	60
Grp Volume(v), veh/h	1	0	2	991	0	340	2	820	401	341	438	240
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	32.9	0.0	14.4	0.1	25.8	28.6	22.9	8.9	8.9
Cycle Q Clear(g_c), s	0.1	0.0	0.1	32.9	0.0	14.4	0.1	25.8	28.6	22.9	8.9	8.9
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1047	0	833	4	886	391	358	1564	855
V/C Ratio(X)	0.08	0.00	0.15	0.95	0.00	0.41	0.46	0.93	1.02	0.95	0.28	0.28
Avail Cap(c_a), veh/h	147	0	150	1062	0	840	73	886	391	358	1564	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	0.0	54.4	36.4	0.0	14.7	55.0	39.8	40.9	42.4	17.4	17.4
Incr Delay (d2), s/veh	0.9	0.0	2.0	16.2	0.0	0.3	25.4	16.8	51.9	35.0	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	17.1	0.0	6.1	0.1	14.3	17.5	13.7	4.1	4.6
LnGrp Delay(d),s/veh	55.3	0.0	56.3	52.7	0.0	15.0	80.3	56.6	92.8	77.4	17.8	18.2
LnGrp LOS	E		E	D		B	F	E	F	E	B	B
Approach Vol, veh/h		3			1331			1223			1019	
Approach Delay, s/veh		56.0			43.0			68.5			37.9	
Approach LOS		E			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		41.5
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	24.9	30.6		2.1	2.1	10.9		34.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	21.3		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	50.3
HCM 2010 LOS	D

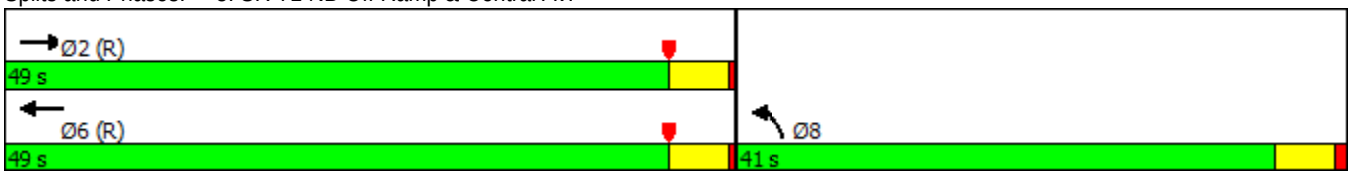
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	982	834	97
Future Volume (vph)	982	834	97
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	49.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	59.4	59.4	21.1
Actuated g/C Ratio	0.66	0.66	0.23
v/c Ratio	0.36	0.31	1.16dr
Control Delay	4.1	7.4	37.7
Queue Delay	0.0	0.0	0.0
Total Delay	4.1	7.4	37.7
LOS	A	A	D
Approach Delay	4.1	7.4	37.7
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 44.0%	ICU Level of Service A
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	982	0	0	834	97	364
Future Volume (veh/h)	982	0	0	834	97	364
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	0	0	1800	1700	1800
Adj Flow Rate, veh/h	1183	0	0	1005	117	246
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3490	0	0	3490	298	282
Arrive On Green	1.00	0.00	0.00	0.71	0.18	0.18
Sat Flow, veh/h	5238	0	0	5238	1619	1530
Grp Volume(v), veh/h	1183	0	0	1005	117	246
Grp Sat Flow(s),veh/h/ln	1638	0	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	6.7	5.7	14.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.7	5.7	14.1
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	3490	0	0	3490	298	282
V/C Ratio(X)	0.34	0.00	0.00	0.29	0.39	0.87
Avail Cap(c_a), veh/h	3490	0	0	3490	648	612
HCM Platoon Ratio	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.8	32.3	35.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.2	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	3.0	2.6	6.2
LnGrp Delay(d),s/veh	0.3	0.0	0.0	5.0	32.6	39.0
LnGrp LOS	A			A	C	D
Approach Vol, veh/h	1183			1005	363	
Approach Delay, s/veh	0.3			5.0	36.9	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		68.4				68.4		21.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		36.0
Max Q Clear Time (g_c+I1), s		2.0				8.7		16.1
Green Ext Time (p_c), s		13.7				13.1		0.5

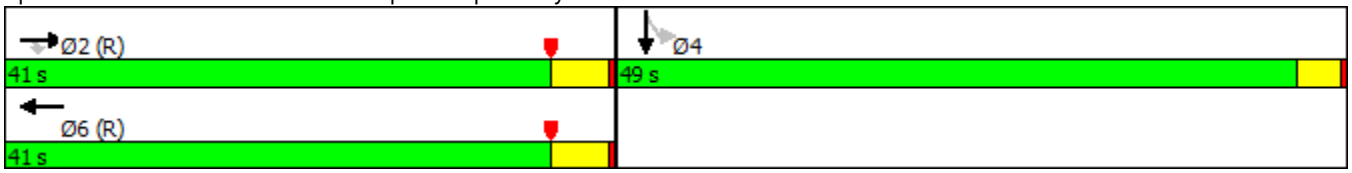
Intersection Summary	
HCM 2010 Ctrl Delay	7.3
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1308	69	739	438	0
Future Volume (vph)	1308	69	739	438	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	41.0	41.0	41.0	49.0	49.0
Total Split (%)	45.6%	45.6%	45.6%	54.4%	54.4%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	46.1	46.1	46.1	35.9	35.9
Actuated g/C Ratio	0.51	0.51	0.51	0.40	0.40
v/c Ratio	0.66	0.11	0.37	0.82	0.79
Control Delay	19.3	4.2	10.1	34.6	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	4.2	10.1	34.6	30.5
LOS	B	A	B	C	C
Approach Delay	18.5		10.1		32.6
Approach LOS	B		B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 20.2	Intersection LOS: C
Intersection Capacity Utilization 57.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1308	69	0	739	0	0	0	0	438	0	344
Future Volume (veh/h)	0	1308	69	0	739	0	0	0	0	438	0	344
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1656	0	0	935	0				424	182	294
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2870	894	0	2870	0				530	203	328
Arrive On Green	0.00	0.58	0.00	0.00	1.00	0.00				0.33	0.33	0.33
Sat Flow, veh/h	0	5076	1530	0	5238	0				1619	621	1002
Grp Volume(v), veh/h	0	1656	0	0	935	0				424	0	476
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	0				1619	0	1623
Q Serve(g_s), s	0.0	19.0	0.0	0.0	0.0	0.0				21.5	0.0	25.1
Cycle Q Clear(g_c), s	0.0	19.0	0.0	0.0	0.0	0.0				21.5	0.0	25.1
Prop In Lane	0.00		1.00	0.00		0.00				1.00		0.62
Lane Grp Cap(c), veh/h	0	2870	894	0	2870	0				530	0	531
V/C Ratio(X)	0.00	0.58	0.00	0.00	0.33	0.00				0.80	0.00	0.90
Avail Cap(c_a), veh/h	0	2870	894	0	2870	0				819	0	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.7	0.0	0.0	0.0	0.0				27.6	0.0	28.8
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.0	0.3	0.0				1.5	0.0	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.8	0.0	0.0	0.1	0.0				9.8	0.0	12.1
LnGrp Delay(d),s/veh	0.0	12.6	0.0	0.0	0.3	0.0				29.1	0.0	34.8
LnGrp LOS		B			A					C		C
Approach Vol, veh/h		1656			935						900	
Approach Delay, s/veh		12.6			0.3						32.1	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		57.1		32.9		57.1		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		36.5		45.5		36.5		
Max Q Clear Time (g_c+I1), s		21.0		27.1		2.0		
Green Ext Time (p_c), s		11.9		2.3		20.9		

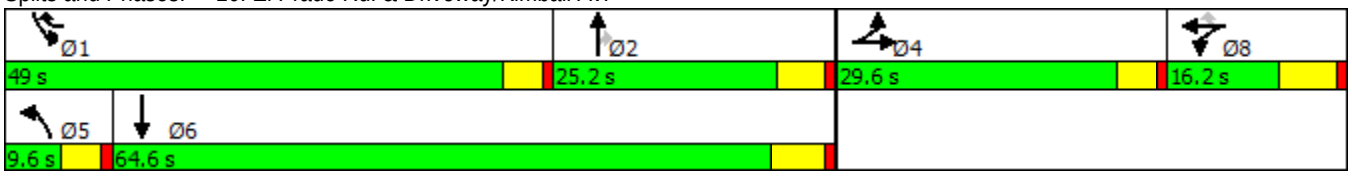
Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	1	25	1059	5	270	31	488	195
Future Volume (vph)	11	1	25	1059	5	270	31	488	195
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.4	58.3	5.2	19.1	19.1	46.0	59.2
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.62
v/c Ratio	0.05	0.01	0.28	0.91	0.06	0.76	0.07	0.64	0.12
Control Delay	40.1	30.3	49.4	21.5	52.6	53.8	0.3	27.7	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.3	49.4	21.5	52.6	53.8	0.3	27.7	9.3
LOS	D	C	D	C	D	D	A	C	A
Approach Delay		38.0	22.8			48.3			21.7
Approach LOS		D	C			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 26.2	Intersection LOS: C
Intersection Capacity Utilization 104.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	2	27	25	1059	5	270	31	488	195	41
Future Volume (veh/h)	11	1	2	27	25	1059	5	270	31	488	195	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	1	1	28	26	220	5	276	32	498	199	42
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	52	26	26	127	118	724	113	356	303	540	1303	269
Arrive On Green	0.03	0.03	0.03	0.14	0.14	0.14	0.07	0.20	0.20	0.33	0.46	0.46
Sat Flow, veh/h	1619	827	827	910	845	1530	1619	1800	1530	1619	2822	584
Grp Volume(v), veh/h	11	0	2	54	0	220	5	276	32	498	119	122
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1696
Q Serve(g_s), s	0.5	0.0	0.1	1.9	0.0	6.3	0.2	10.4	1.2	21.1	2.9	3.0
Cycle Q Clear(g_c), s	0.5	0.0	0.1	1.9	0.0	6.3	0.2	10.4	1.2	21.1	2.9	3.0
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	52	0	53	245	0	724	113	356	303	540	789	783
V/C Ratio(X)	0.21	0.00	0.04	0.22	0.00	0.30	0.04	0.77	0.11	0.92	0.15	0.16
Avail Cap(c_a), veh/h	567	0	579	246	0	725	113	504	429	1007	1409	1398
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	0.0	33.5	27.3	0.0	11.6	31.0	27.1	23.4	22.9	11.1	11.1
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.4	0.0	0.2	0.1	4.8	0.2	2.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.0	0.0	2.7	0.1	5.6	0.5	9.8	1.4	1.4
LnGrp Delay(d),s/veh	35.7	0.0	33.8	27.7	0.0	11.8	31.0	31.9	23.6	25.8	11.2	11.2
LnGrp LOS	D		C	C		B	C	C	C	C	B	B
Approach Vol, veh/h		13			274			313			739	
Approach Delay, s/veh		35.4			14.9			31.0			21.0	
Approach LOS		D			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.4	19.9		6.9	9.6	38.7		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	23.1	12.4		2.5	2.2	5.0		8.3
Green Ext Time (p_c), s	0.7	1.8		0.0	0.0	3.1		0.2

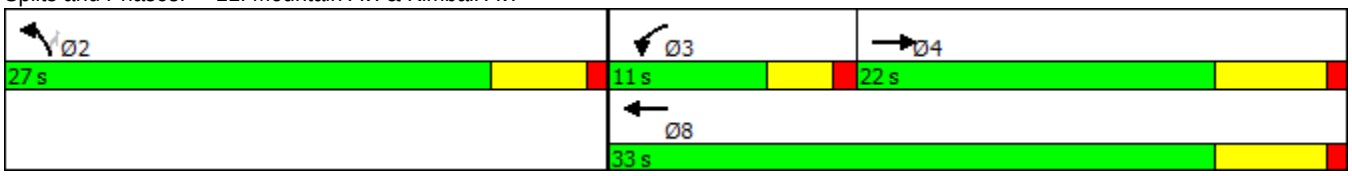
Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	444	77	910	244	19
Future Volume (vph)	444	77	910	244	19
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	12.6	7.5	18.2	11.2	11.2
Actuated g/C Ratio	0.30	0.18	0.44	0.27	0.27
v/c Ratio	0.54	0.27	0.63	0.58	0.05
Control Delay	15.3	22.2	11.3	20.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	22.2	11.3	20.5	7.2
LOS	B	C	B	C	A
Approach Delay	15.3		12.1	19.5	
Approach LOS	B		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 41.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 51.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	444	90	77	910	244	19
Future Volume (veh/h)	444	90	77	910	244	19
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	462	89	80	948	254	15
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	799	153	171	1681	334	316
Arrive On Green	0.28	0.28	0.11	0.49	0.21	0.21
Sat Flow, veh/h	2955	549	1619	3510	1619	1530
Grp Volume(v), veh/h	275	276	80	948	254	15
Grp Sat Flow(s),veh/h/ln	1710	1703	1619	1710	1619	1530
Q Serve(g_s), s	5.2	5.2	1.7	7.3	5.5	0.3
Cycle Q Clear(g_c), s	5.2	5.2	1.7	7.3	5.5	0.3
Prop In Lane		0.32	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	477	475	171	1681	334	316
V/C Ratio(X)	0.58	0.58	0.47	0.56	0.76	0.05
Avail Cap(c_a), veh/h	732	729	303	2469	940	888
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	11.6	15.7	6.7	14.0	11.9
Incr Delay (d2), s/veh	0.4	0.4	0.7	0.1	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.5	0.8	3.4	2.6	0.1
LnGrp Delay(d),s/veh	12.0	12.0	16.5	6.8	15.3	11.9
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	551			1028	269	
Approach Delay, s/veh	12.0			7.6	15.1	
Approach LOS	B			A	B	

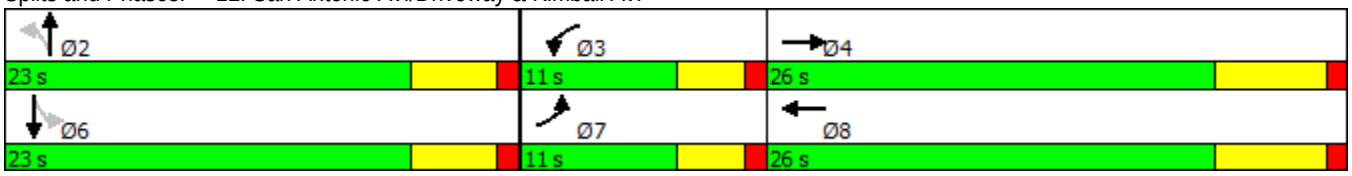
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.0	8.0	16.4				24.4
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		7.5	3.7	7.2				9.3
Green Ext Time (p_c), s		0.2	0.0	3.2				4.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.0
HCM 2010 LOS	A

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	393	35	992	42	0		
Future Volume (vph)	393	35	992	42	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	26.0	11.0	26.0	23.0	23.0	23.0	11.0
Total Split (%)	43.3%	18.3%	43.3%	38.3%	38.3%	38%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	16.0	7.4	17.5	8.8	8.8		
Actuated g/C Ratio	0.42	0.20	0.46	0.23	0.23		
v/c Ratio	0.33	0.12	0.67	0.15	0.02		
Control Delay	9.2	17.8	10.5	14.0	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	9.2	17.8	10.5	14.0	0.1		
LOS	A	B	B	B	A		
Approach Delay	9.2		10.7		10.5		
Approach LOS	A		B		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 37.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 47.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	393	56	35	992	0	42	0	14	0	0	0
Future Volume (veh/h)	0	393	56	35	992	0	42	0	14	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	418	60	37	1055	0	45	0	12	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	885	126	98	1620	0	545	0	315	212	371	0
Arrive On Green	0.00	0.30	0.30	0.06	0.47	0.00	0.21	0.00	0.21	0.00	0.00	0.00
Sat Flow, veh/h	1619	2997	427	1619	3510	0	1619	0	1530	1345	1800	0
Grp Volume(v), veh/h	0	237	241	37	1055	0	45	0	12	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1714	1619	1710	0	1619	0	1530	1345	1800	0
Q Serve(g_s), s	0.0	3.9	3.9	0.7	8.0	0.0	0.8	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.9	3.9	0.7	8.0	0.0	0.8	0.0	0.2	0.0	0.0	0.0
Prop In Lane	1.00		0.25	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	5	505	506	98	1620	0	545	0	315	212	371	0
V/C Ratio(X)	0.00	0.47	0.48	0.38	0.65	0.00	0.08	0.00	0.04	0.00	0.00	0.00
Avail Cap(c_a), veh/h	333	1006	1008	333	2011	0	1073	0	814	651	958	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.8	9.8	15.4	6.8	0.0	11.0	0.0	10.8	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.8	0.4	3.7	0.0	0.3	0.0	0.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	10.1	10.1	16.2	7.1	0.0	11.1	0.0	10.8	0.0	0.0	0.0
LnGrp LOS		B	B	B	A		B		B			
Approach Vol, veh/h		478			1092			57			0	
Approach Delay, s/veh		10.1			7.4			11.0			0.0	
Approach LOS		B			A			B				

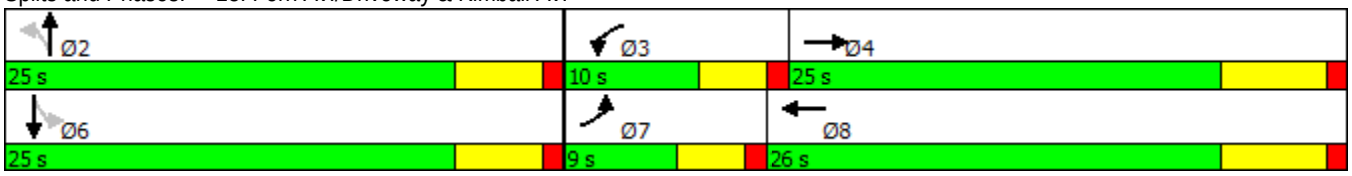
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.1	16.0		11.9	0.0	22.1
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		2.8	2.7	5.9		0.0	0.0	10.0
Green Ext Time (p_c), s		0.0	0.0	4.1		0.0	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	322	37	977	43	0	14	1
Future Volume (vph)	10	322	37	977	43	0	14	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.4	17.0	5.6	17.1	7.5	7.5	7.5	7.5
Actuated g/C Ratio	0.15	0.46	0.15	0.46	0.20	0.20	0.20	0.20
v/c Ratio	0.05	0.28	0.17	0.69	0.19	0.04	0.06	0.01
Control Delay	20.1	8.0	20.2	13.9	15.0	0.1	13.5	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	8.0	20.2	13.9	15.0	0.1	13.5	10.2
LOS	C	A	C	B	B	A	B	B
Approach Delay		8.3		14.1		9.5		12.8
Approach LOS		A		B		A		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 37.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	322	64	37	977	3	43	0	25	14	1	3
Future Volume (veh/h)	10	322	64	37	977	3	43	0	25	14	1	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	358	64	41	1086	3	48	0	18	16	1	2
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	23	1096	194	76	1439	4	407	0	224	393	79	157
Arrive On Green	0.01	0.38	0.38	0.05	0.41	0.41	0.15	0.00	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1619	2895	512	1619	3499	10	1356	0	1530	1338	537	1074
Grp Volume(v), veh/h	11	210	212	41	531	558	48	0	18	16	0	3
Grp Sat Flow(s),veh/h/ln	1619	1710	1697	1619	1710	1798	1356	0	1530	1338	0	1611
Q Serve(g_s), s	0.2	3.0	3.0	0.8	9.0	9.0	1.1	0.0	0.3	0.4	0.0	0.1
Cycle Q Clear(g_c), s	0.2	3.0	3.0	0.8	9.0	9.0	1.1	0.0	0.3	0.7	0.0	0.1
Prop In Lane	1.00		0.30	1.00		0.01	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	23	648	643	76	704	740	407	0	224	393	0	236
V/C Ratio(X)	0.47	0.32	0.33	0.54	0.75	0.75	0.12	0.00	0.08	0.04	0.00	0.01
Avail Cap(c_a), veh/h	237	967	959	285	1017	1069	1007	0	901	985	0	948
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	7.5	7.5	15.9	8.6	8.6	12.9	0.0	12.6	12.9	0.0	12.5
Incr Delay (d2), s/veh	5.3	0.1	0.1	2.2	0.9	0.9	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.4	1.4	0.4	4.3	4.5	0.4	0.0	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	22.0	7.6	7.6	18.1	9.5	9.5	13.0	0.0	12.6	12.9	0.0	12.5
LnGrp LOS	C	A	A	B	A	A	B		B	B		B
Approach Vol, veh/h		433			1130			66			19	
Approach Delay, s/veh		8.0			9.8			12.9			12.8	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	5.6	18.6		9.9	4.5	19.7
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.1	2.8	5.0		2.7	2.2	11.0
Green Ext Time (p_c), s		0.1	0.0	3.5		0.1	0.0	3.0

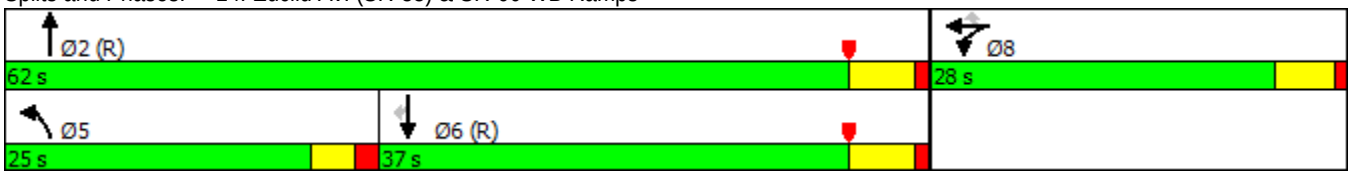
Intersection Summary	
HCM 2010 Ctrl Delay	9.5
HCM 2010 LOS	A

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	584	2	364	292	896	958	461
Future Volume (vph)	584	2	364	292	896	958	461
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	22.2	22.2	22.2	19.5	57.3	33.4	33.4
Actuated g/C Ratio	0.25	0.25	0.25	0.22	0.64	0.37	0.37
v/c Ratio	0.93	0.90	0.69	0.90	0.44	0.81	0.58
Control Delay	66.7	59.5	25.7	49.0	18.6	32.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	66.7	59.5	25.7	49.0	19.9	32.6	5.2
LOS	E	E	C	D	B	C	A
Approach Delay		51.4			27.1	23.7	
Approach LOS		D			C	C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 32.2 — Intersection LOS: C
Intersection Capacity Utilization 84.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	584	2	364	292	896	0	0	958	461
Future Volume (veh/h)	0	0	0	584	2	364	292	896	0	0	958	461
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				702	0	158	314	963	0	0	1030	496
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				773	0	365	337	2205	0	0	1322	570
Arrive On Green				0.24	0.00	0.24	0.42	1.00	0.00	0.00	0.39	0.39
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1475
Grp Volume(v), veh/h				702	0	158	314	963	0	0	1030	496
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1475
Q Serve(g_s), s				19.0	0.0	7.9	16.6	0.0	0.0	0.0	23.8	28.0
Cycle Q Clear(g_c), s				19.0	0.0	7.9	16.6	0.0	0.0	0.0	23.8	28.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				773	0	365	337	2205	0	0	1322	570
V/C Ratio(X)				0.91	0.00	0.43	0.93	0.44	0.00	0.00	0.78	0.87
Avail Cap(c_a), veh/h				828	0	391	369	2205	0	0	1322	570
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.60	0.60	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.3	0.0	29.1	25.6	0.0	0.0	0.0	24.2	25.5
Incr Delay (d2), s/veh				12.8	0.0	0.3	19.4	0.4	0.0	0.0	4.6	16.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				9.9	0.0	3.4	9.1	0.1	0.0	0.0	12.0	13.9
LnGrp Delay(d),s/veh				46.1	0.0	29.4	45.1	0.4	0.0	0.0	28.8	42.0
LnGrp LOS				D		C	D	A			C	D
Approach Vol, veh/h					860			1277			1526	
Approach Delay, s/veh					43.0			11.4			33.1	
Approach LOS					D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		63.5			23.2	40.3		26.5
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			18.6	30.0		21.0
Green Ext Time (p_c), s		39.5			0.1	1.5		0.5

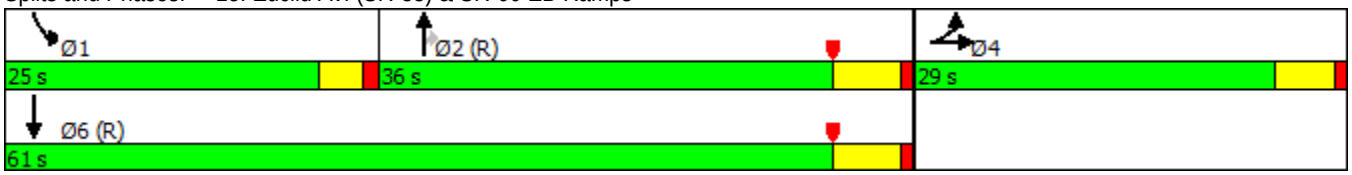
Intersection Summary	
HCM 2010 Ctrl Delay	27.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	324	0	864	537	287	1255
Future Volume (vph)	324	0	864	537	287	1255
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	21.3	21.3	34.9	34.9	19.4	58.2
Actuated g/C Ratio	0.24	0.24	0.39	0.39	0.22	0.65
v/c Ratio	0.86	0.89	0.69	0.62	0.88	0.60
Control Delay	55.3	51.1	27.8	5.4	54.3	4.5
Queue Delay	0.2	0.3	0.0	0.0	0.0	0.6
Total Delay	55.5	51.3	27.8	5.4	54.3	5.0
LOS	E	D	C	A	D	A
Approach Delay		53.2	19.2			14.2
Approach LOS		D	B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 84.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	324	0	309	0	0	0	0	864	537	287	1255	0
Future Volume (veh/h)	324	0	309	0	0	0	0	864	537	287	1255	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	296	69	246				0	919	571	305	1335	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	363	78	277				0	1398	622	334	2255	0
Arrive On Green	0.22	0.22	0.22				0.00	0.41	0.41	0.27	0.88	0.00
Sat Flow, veh/h	1619	347	1235				0	3510	1523	1619	3510	0
Grp Volume(v), veh/h	296	0	315				0	919	571	305	1335	0
Grp Sat Flow(s),veh/h/ln	1619	0	1582				0	1710	1523	1619	1710	0
Q Serve(g_s), s	15.6	0.0	17.4				0.0	19.6	31.9	16.4	9.0	0.0
Cycle Q Clear(g_c), s	15.6	0.0	17.4				0.0	19.6	31.9	16.4	9.0	0.0
Prop In Lane	1.00		0.78				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	363	0	354				0	1398	622	334	2255	0
V/C Ratio(X)	0.82	0.00	0.89				0.00	0.66	0.92	0.91	0.59	0.00
Avail Cap(c_a), veh/h	432	0	422				0	1398	622	378	2255	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.84	0.84	0.42	0.42	0.00
Uniform Delay (d), s/veh	33.2	0.0	33.8				0.0	21.5	25.2	31.9	2.4	0.0
Incr Delay (d2), s/veh	8.4	0.0	16.4				0.0	2.1	18.2	12.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	9.2				0.0	9.6	16.5	8.4	4.0	0.0
LnGrp Delay(d),s/veh	41.6	0.0	50.2				0.0	23.6	43.4	43.9	2.9	0.0
LnGrp LOS	D		D					C	D	D	A	
Approach Vol, veh/h		611						1490			1640	
Approach Delay, s/veh		46.0						31.2			10.6	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.5	42.3		25.2		64.8		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	18.4	33.9		19.4		11.0		
Green Ext Time (p_c), s	0.1	0.0		0.8		37.7		

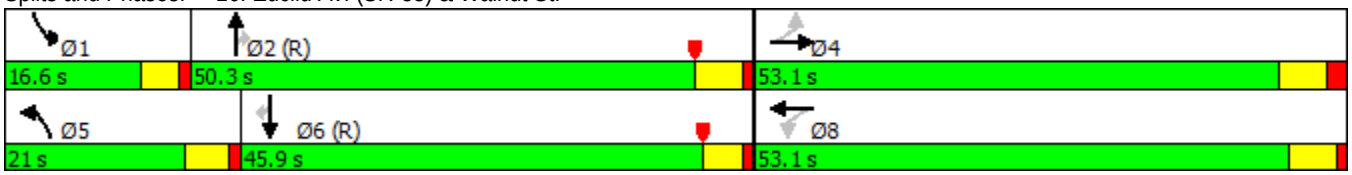
Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	147	326	79	301	101	1067	48	154	1139	56
Future Volume (vph)	147	326	79	301	101	1067	48	154	1139	56
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.0	33.0	34.0	34.0	12.7	60.4	60.4	10.5	58.6	58.6
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.11	0.50	0.50	0.09	0.49	0.49
v/c Ratio	0.97	0.48	0.44	0.50	0.62	0.45	0.06	0.63	0.50	0.08
Control Delay	106.9	33.3	39.3	28.1	68.2	12.3	5.1	64.0	24.3	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.9	33.3	39.3	28.1	68.2	12.3	5.1	64.0	24.3	4.7
LOS	F	C	D	C	E	B	A	E	C	A
Approach Delay		52.3		29.7		16.6			28.0	
Approach LOS		D		C		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 28.2	Intersection LOS: C
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	326	98	79	301	168	101	1067	48	154	1139	56
Future Volume (veh/h)	147	326	98	79	301	168	101	1067	48	154	1139	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	155	343	81	83	317	144	106	1123	32	162	1199	30
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	257	913	213	277	760	337	130	2277	709	210	2215	689
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.03	0.15	0.15	0.07	0.45	0.45
Sat Flow, veh/h	892	2754	642	924	2292	1017	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	155	211	213	83	235	226	106	1123	32	162	1199	30
Grp Sat Flow(s),veh/h/ln	892	1710	1686	924	1710	1600	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	19.7	11.3	11.6	9.1	12.8	13.2	7.8	25.1	2.1	6.5	21.3	1.3
Cycle Q Clear(g_c), s	32.9	11.3	11.6	20.6	12.8	13.2	7.8	25.1	2.1	6.5	21.3	1.3
Prop In Lane	1.00		0.38	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	257	567	559	277	567	530	130	2277	709	210	2215	689
V/C Ratio(X)	0.60	0.37	0.38	0.30	0.41	0.43	0.82	0.49	0.05	0.77	0.54	0.04
Avail Cap(c_a), veh/h	310	667	658	339	681	637	217	2277	709	298	2215	689
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.58	0.58	0.77	0.77	0.77
Uniform Delay (d), s/veh	44.0	30.6	30.7	38.6	31.1	31.2	57.5	37.9	28.2	54.8	23.9	18.5
Incr Delay (d2), s/veh	2.3	0.4	0.4	0.6	0.5	0.5	7.1	0.4	0.1	3.5	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	5.4	5.4	2.4	6.1	5.9	3.8	11.5	0.9	2.7	9.7	0.6
LnGrp Delay(d),s/veh	46.3	31.0	31.1	39.2	31.6	31.8	64.6	38.4	28.2	58.3	24.7	18.6
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	C	B
Approach Vol, veh/h		579			544			1261			1391	
Approach Delay, s/veh		35.1			32.8			40.3			28.4	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	60.9		46.1	14.5	59.4		46.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	8.5	27.1		34.9	9.8	23.3		22.6
Green Ext Time (p_c), s	0.1	12.3		4.9	0.1	12.4		6.7

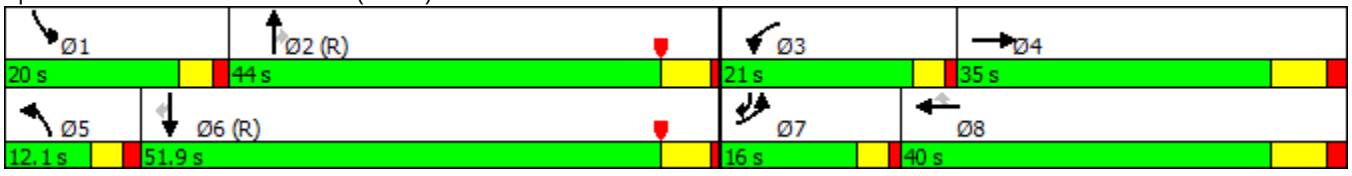
Intersection Summary		
HCM 2010 Ctrl Delay		34.1
HCM 2010 LOS		C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	318	169	373	49	61	927	165	175	1003	145
Future Volume (vph)	139	318	169	373	49	61	927	165	175	1003	145
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	16.0	35.0	21.0	40.0	40.0	12.1	44.0	44.0	20.0	51.9	16.0
Total Split (%)	13.3%	29.2%	17.5%	33.3%	33.3%	10.1%	36.7%	36.7%	16.7%	43.3%	13.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.6	20.5	15.6	23.5	23.5	9.1	44.8	44.8	18.1	56.0	74.1
Actuated g/C Ratio	0.10	0.17	0.13	0.20	0.20	0.08	0.37	0.37	0.15	0.47	0.62
v/c Ratio	0.86	0.67	0.85	0.59	0.13	0.53	0.76	0.25	0.76	0.66	0.15
Control Delay	94.6	50.2	84.3	46.5	0.6	63.7	38.4	9.2	70.8	16.5	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	50.2	84.3	46.5	0.6	63.7	38.4	9.2	70.8	16.5	2.4
LOS	F	D	F	D	A	E	D	A	E	B	A
Approach Delay		62.3		53.5			35.6			22.1	
Approach LOS		E		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 37.4	Intersection LOS: D
Intersection Capacity Utilization 77.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	318	51	169	373	49	61	927	165	175	1003	145
Future Volume (veh/h)	139	318	51	169	373	49	61	927	165	175	1003	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	146	335	31	178	393	47	64	976	93	184	1056	87
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	512	47	202	639	285	80	1408	630	205	1672	901
Arrive On Green	0.10	0.16	0.16	0.12	0.19	0.19	0.05	0.41	0.41	0.25	0.98	0.98
Sat Flow, veh/h	1619	3163	291	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	146	180	186	178	393	47	64	976	93	184	1056	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1743	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	10.7	11.8	12.0	13.0	12.7	3.1	4.7	28.2	4.6	13.2	2.1	0.1
Cycle Q Clear(g_c), s	10.7	11.8	12.0	13.0	12.7	3.1	4.7	28.2	4.6	13.2	2.1	0.1
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	277	282	202	639	285	80	1408	630	205	1672	901
V/C Ratio(X)	0.90	0.65	0.66	0.88	0.62	0.16	0.80	0.69	0.15	0.90	0.63	0.10
Avail Cap(c_a), veh/h	162	399	407	229	941	420	103	1408	630	209	1672	901
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.85	0.85	0.86	0.86	0.86
Uniform Delay (d), s/veh	53.4	47.1	47.2	51.6	44.8	40.9	56.5	29.0	22.1	44.1	0.7	0.4
Incr Delay (d2), s/veh	42.6	3.6	3.7	26.0	1.4	0.4	25.1	2.4	0.4	32.1	1.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	5.9	6.1	7.2	6.1	1.3	2.7	13.8	2.0	7.6	0.9	0.1
LnGrp Delay(d),s/veh	96.0	50.7	50.9	77.7	46.2	41.3	81.6	31.5	22.5	76.2	2.3	0.6
LnGrp LOS	F	D	D	E	D	D	F	C	C	E	A	A
Approach Vol, veh/h		512			618			1133			1327	
Approach Delay, s/veh		63.7			54.9			33.6			12.4	
Approach LOS		E			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	54.9	19.0	26.4	10.4	64.2	16.0	29.4
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	38.5	17.0	28.0	7.6	46.4	12.0	33.0
Max Q Clear Time (g_c+I1), s	15.2	30.2	15.0	14.0	6.7	4.1	12.7	14.7
Green Ext Time (p_c), s	0.0	6.7	0.0	5.2	0.0	21.0	0.0	5.9

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	97	119	46	59	155	55	997	131	28	109	95
Future Volume (vph)	97	119	46	59	155	55	997	131	28	109	95
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	24.9	24.9	24.9		24.9	8.7	75.3	75.3	6.8	71.6	71.6
Actuated g/C Ratio	0.21	0.21	0.21		0.21	0.07	0.63	0.63	0.06	0.60	0.60
v/c Ratio	0.67	0.34	0.12		0.80	0.50	0.49	0.14	0.32	0.06	0.11
Control Delay	63.9	41.4	1.5		61.7	94.6	5.5	1.0	56.6	11.3	8.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	41.4	1.5		61.7	94.6	5.5	1.0	56.6	11.3	8.2
LOS	E	D	A		E	F	A	A	E	B	A
Approach Delay		42.8			61.7		9.2			15.4	
Approach LOS		D			E		A			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 21.3	Intersection LOS: C
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	119	46	59	155	35	55	997	131	28	109	95
Future Volume (veh/h)	97	119	46	59	155	35	55	997	131	28	109	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	102	125	24	62	163	33	58	1049	102	29	115	71
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	197	385	323	97	216	40	72	2130	953	42	2066	923
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.09	1.00	1.00	0.01	0.20	0.20
Sat Flow, veh/h	1139	1800	1510	279	1008	189	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	102	125	24	258	0	0	58	1049	102	29	115	71
Grp Sat Flow(s),veh/h/ln	1139	1800	1510	1476	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	1.1	7.0	1.5	13.5	0.0	0.0	4.2	0.0	0.0	2.1	3.3	4.5
Cycle Q Clear(g_c), s	21.6	7.0	1.5	20.5	0.0	0.0	4.2	0.0	0.0	2.1	3.3	4.5
Prop In Lane	1.00		1.00	0.24		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	385	323	353	0	0	72	2130	953	42	2066	923
V/C Ratio(X)	0.52	0.32	0.07	0.73	0.00	0.00	0.81	0.49	0.11	0.69	0.06	0.08
Avail Cap(c_a), veh/h	305	555	466	504	0	0	169	2130	953	101	2066	923
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.77	0.77	0.77	0.66	0.66	0.66
Uniform Delay (d), s/veh	46.1	39.8	37.7	45.5	0.0	0.0	54.2	0.0	0.0	59.0	20.3	20.8
Incr Delay (d2), s/veh	2.1	0.5	0.1	3.2	0.0	0.0	6.0	0.6	0.2	5.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.6	0.6	8.5	0.0	0.0	2.0	0.2	0.0	1.0	1.6	2.0
LnGrp Delay(d),s/veh	48.2	40.3	37.8	48.7	0.0	0.0	60.2	0.6	0.2	64.0	20.4	20.9
LnGrp LOS	D	D	D	D			E	A	A	E	C	C
Approach Vol, veh/h		251			258			1209			215	
Approach Delay, s/veh		43.3			48.7			3.5			26.4	
Approach LOS		D			D			A			C	

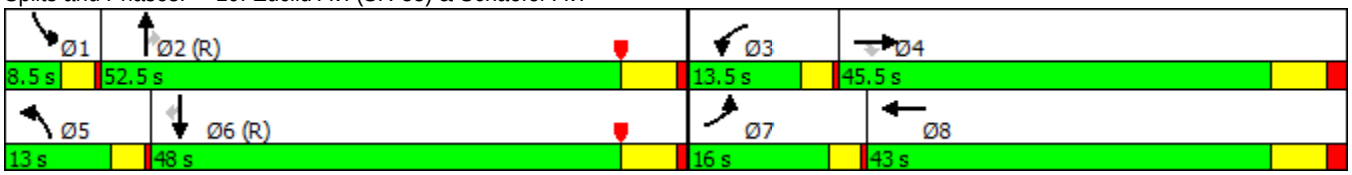
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	80.7		32.7	8.8	78.5		32.7
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.1	2.0		23.6	6.2	6.5		22.5
Green Ext Time (p_c), s	0.0	9.9		2.1	0.0	9.8		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	134	59	81	51	114	94	1057	18	14	1027	127
Future Volume (vph)	134	59	81	51	114	94	1057	18	14	1027	127
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.9	22.8	22.8	10.0	17.2	11.1	69.7	69.7	5.4	58.8	58.8
Actuated g/C Ratio	0.11	0.19	0.19	0.08	0.14	0.09	0.58	0.58	0.04	0.49	0.49
v/c Ratio	0.83	0.18	0.22	0.40	0.54	0.67	0.57	0.02	0.21	0.65	0.17
Control Delay	87.4	40.2	3.1	61.7	51.0	55.9	27.5	1.0	62.9	27.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.4	40.2	3.1	61.7	51.0	55.9	27.5	1.0	62.9	27.4	5.6
LOS	F	D	A	E	D	E	C	A	E	C	A
Approach Delay		52.4			54.0		29.3			25.5	
Approach LOS		D			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 31.6	Intersection LOS: C
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	59	81	51	114	17	94	1057	18	14	1027	127
Future Volume (veh/h)	134	59	81	51	114	17	94	1057	18	14	1027	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	143	63	34	54	121	16	100	1124	14	15	1093	87
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	166	239	203	113	155	20	122	2102	941	27	1902	831
Arrive On Green	0.10	0.13	0.13	0.07	0.10	0.10	0.05	0.41	0.41	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1558	206	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	143	63	34	54	0	137	100	1124	14	15	1093	87
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	10.4	3.8	2.4	3.9	0.0	9.1	7.3	29.7	0.6	1.1	35.0	5.8
Cycle Q Clear(g_c), s	10.4	3.8	2.4	3.9	0.0	9.1	7.3	29.7	0.6	1.1	35.0	5.8
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	166	239	203	113	0	175	122	2102	941	27	1902	831
V/C Ratio(X)	0.86	0.26	0.17	0.48	0.00	0.78	0.82	0.53	0.01	0.57	0.57	0.10
Avail Cap(c_a), veh/h	169	578	491	135	0	529	128	2102	941	67	1902	831
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.68	0.68	0.68	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	46.8	46.2	53.7	0.0	52.8	56.2	22.3	13.8	59.2	36.0	24.1
Incr Delay (d2), s/veh	31.8	0.4	0.3	1.2	0.0	5.6	21.8	0.7	0.0	6.8	1.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	1.9	1.0	1.8	0.0	4.7	4.0	14.2	0.3	0.5	17.0	2.5
LnGrp Delay(d),s/veh	84.8	47.2	46.5	54.9	0.0	58.3	78.0	23.0	13.8	66.1	37.3	24.4
LnGrp LOS	F	D	D	D		E	E	C	B	E	D	C
Approach Vol, veh/h		240			191			1238			1195	
Approach Delay, s/veh		69.5			57.3			27.3			36.7	
Approach LOS		E			E			C			D	

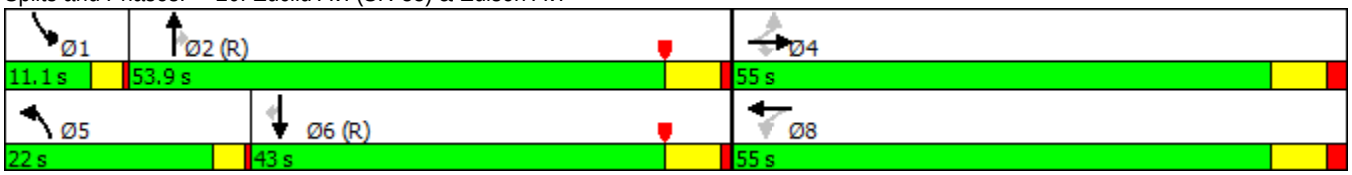
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	79.8	11.8	22.9	12.5	72.7	15.8	18.9
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.1	31.7	5.9	5.8	9.3	37.0	12.4	11.1
Green Ext Time (p_c), s	0.0	11.1	0.0	0.9	0.0	4.3	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	36.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	206	158	143	61	328	182	893	33	39	841	237
Future Volume (vph)	206	158	143	61	328	182	893	33	39	841	237
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.0	43.0	43.0	43.0	43.0	16.9	55.5	55.5	6.7	43.6	43.6
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.14	0.46	0.46	0.06	0.36	0.36
v/c Ratio	1.01	0.26	0.24	0.17	0.61	0.85	0.60	0.05	0.46	0.72	0.37
Control Delay	102.3	27.1	4.5	25.4	34.7	68.6	35.8	7.2	91.3	19.4	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.3	27.1	4.5	25.4	34.7	68.6	35.8	7.2	91.3	19.4	5.0
LOS	F	C	A	C	C	E	D	A	F	B	A
Approach Delay		51.3			33.4		40.3			18.8	
Approach LOS		D			C		D			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 33.6	Intersection LOS: C
Intersection Capacity Utilization 93.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	158	143	61	328	38	182	893	33	39	841	237
Future Volume (veh/h)	206	158	143	61	328	38	182	893	33	39	841	237
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	219	168	85	65	349	38	194	950	20	41	895	221
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	282	720	612	426	638	69	218	1475	660	50	1121	501
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.13	0.43	0.43	0.06	0.66	0.66
Sat Flow, veh/h	956	1800	1530	1081	1595	174	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	219	168	85	65	0	387	194	950	20	41	895	221
Grp Sat Flow(s),veh/h/ln	956	1800	1530	1081	0	1769	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	27.4	7.4	4.2	5.1	0.0	20.2	14.1	26.2	0.9	3.0	22.7	8.4
Cycle Q Clear(g_c), s	47.6	7.4	4.2	12.5	0.0	20.2	14.1	26.2	0.9	3.0	22.7	8.4
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	282	720	612	426	0	708	218	1475	660	50	1121	501
V/C Ratio(X)	0.78	0.23	0.14	0.15	0.00	0.55	0.89	0.64	0.03	0.81	0.80	0.44
Avail Cap(c_a), veh/h	282	720	612	426	0	708	250	1475	660	103	1121	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.91	0.91	0.91	0.76	0.76	0.76
Uniform Delay (d), s/veh	45.9	23.8	22.9	28.0	0.0	27.6	51.0	26.9	19.7	55.9	17.8	15.3
Incr Delay (d2), s/veh	12.9	0.2	0.1	0.2	0.0	0.9	24.0	2.0	0.1	8.6	4.6	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	3.7	1.8	1.5	0.0	10.0	7.8	12.8	0.4	1.5	11.1	3.7
LnGrp Delay(d),s/veh	58.8	24.0	23.0	28.1	0.0	28.5	75.0	28.8	19.7	64.6	22.4	17.5
LnGrp LOS	E	C	C	C		C	E	C	B	E	C	B
Approach Vol, veh/h		472			452			1164			1157	
Approach Delay, s/veh		39.9			28.5			36.4			22.9	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	57.8		55.0	19.7	45.3		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.0	28.2		49.6	16.1	24.7		22.2
Green Ext Time (p_c), s	0.0	12.1		0.0	0.1	8.7		5.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	52	7	130	16	43	129	1034	5	21	991	26
Future Volume (vph)	52	7	130	16	43	129	1034	5	21	991	26
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	21.0	63.5	63.5	9.7	52.2	52.2
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	17.5%	52.9%	52.9%	8.1%	43.5%	43.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.6	15.6	15.6	15.6	15.6	14.1	87.7	87.7	6.2	76.3	76.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.12	0.73	0.73	0.05	0.64	0.64
v/c Ratio	0.35	0.03	0.43	0.10	0.31	0.71	0.43	0.00	0.27	0.47	0.03
Control Delay	48.6	36.7	9.9	40.0	28.9	74.3	6.1	0.0	73.2	7.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	36.7	9.9	40.0	28.9	74.3	6.1	0.0	73.2	7.3	1.1
LOS	D	D	A	D	C	E	A	A	E	A	A
Approach Delay		21.5			31.0		13.6			8.5	
Approach LOS		C			C		B			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	7	130	16	43	30	129	1034	5	21	991	26
Future Volume (veh/h)	52	7	130	16	43	30	129	1034	5	21	991	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	7	49	17	45	24	134	1077	5	22	1032	23
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	140	181	154	186	111	59	158	2603	1164	35	2342	1025
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.76	0.76	0.01	0.23	0.23
Sat Flow, veh/h	1278	1800	1530	1293	1106	590	1619	3420	1530	1619	3420	1497
Grp Volume(v), veh/h	54	7	49	17	0	69	134	1077	5	22	1032	23
Grp Sat Flow(s),veh/h/ln	1278	1800	1530	1293	0	1696	1619	1710	1530	1619	1710	1497
Q Serve(g_s), s	5.0	0.4	3.6	1.4	0.0	4.6	9.8	13.2	0.1	1.6	31.1	1.4
Cycle Q Clear(g_c), s	9.5	0.4	3.6	1.9	0.0	4.6	9.8	13.2	0.1	1.6	31.1	1.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	181	154	186	0	171	158	2603	1164	35	2342	1025
V/C Ratio(X)	0.39	0.04	0.32	0.09	0.00	0.40	0.85	0.41	0.00	0.63	0.44	0.02
Avail Cap(c_a), veh/h	458	630	535	508	0	594	236	2603	1164	84	2342	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.75	0.75	0.75
Uniform Delay (d), s/veh	55.1	48.7	50.1	49.6	0.0	50.6	53.2	5.0	3.4	59.1	26.7	15.2
Incr Delay (d2), s/veh	1.3	0.1	0.9	0.2	0.0	1.1	14.2	0.5	0.0	9.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.2	1.5	0.5	0.0	2.2	5.0	6.3	0.0	0.8	14.9	0.6
LnGrp Delay(d),s/veh	56.3	48.8	51.0	49.7	0.0	51.7	67.5	5.5	3.4	68.9	27.1	15.2
LnGrp LOS	E	D	D	D		D	E	A	A	E	C	B
Approach Vol, veh/h		110			86			1216			1077	
Approach Delay, s/veh		53.5			51.3			12.3			27.7	
Approach LOS		D			D			B			C	

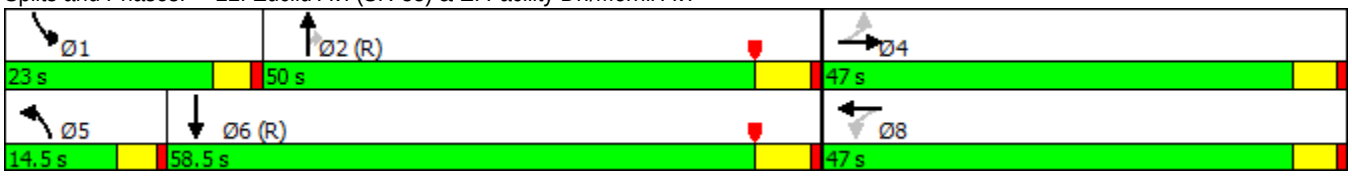
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	97.0		16.9	15.2	87.9		16.9
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	57.8		42.0	17.5	46.5		42.0
Max Q Clear Time (g_c+I1), s	3.6	15.2		11.5	11.8	33.1		6.6
Green Ext Time (p_c), s	0.0	20.3		0.6	0.1	9.8		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	22.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	162	46	19	958	105	165	954
Future Volume (vph)	8	6	162	46	19	958	105	165	954
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		35.8		35.8	10.0	52.7	52.7	15.9	67.4
Actuated g/C Ratio		0.30		0.30	0.08	0.44	0.44	0.13	0.56
v/c Ratio		0.04		0.91	0.15	0.66	0.15	0.80	0.54
Control Delay		22.6		60.2	57.6	20.4	2.8	64.4	18.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.6		60.2	57.6	20.4	2.8	64.4	18.4
LOS		C		E	E	C	A	E	B
Approach Delay		22.6		60.2		19.3			25.0
Approach LOS		C		E		B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	162	46	191	19	958	105	165	954	42
Future Volume (veh/h)	8	6	4	162	46	191	19	958	105	165	954	42
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	169	48	153	20	998	83	172	994	41
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	182	131	58	223	55	166	66	1655	740	196	1890	78
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.04	0.48	0.48	0.12	0.56	0.56
Sat Flow, veh/h	521	492	217	677	207	623	1619	3420	1530	1619	3348	138
Grp Volume(v), veh/h	17	0	0	370	0	0	20	998	83	172	508	527
Grp Sat Flow(s),veh/h/ln	1230	0	0	1507	0	0	1619	1710	1530	1619	1710	1776
Q Serve(g_s), s	0.0	0.0	0.0	27.8	0.0	0.0	1.4	25.5	3.6	12.5	22.1	22.1
Cycle Q Clear(g_c), s	0.9	0.0	0.0	28.7	0.0	0.0	1.4	25.5	3.6	12.5	22.1	22.1
Prop In Lane	0.47		0.18	0.46		0.41	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	371	0	0	444	0	0	66	1655	740	196	966	1003
V/C Ratio(X)	0.05	0.00	0.00	0.83	0.00	0.00	0.30	0.60	0.11	0.88	0.53	0.53
Avail Cap(c_a), veh/h	491	0	0	571	0	0	135	1655	740	250	966	1003
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.73	0.73	0.73	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	0.0	42.8	0.0	0.0	55.9	22.6	16.9	51.8	16.2	16.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	6.6	0.0	0.0	0.7	1.2	0.2	20.3	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	12.7	0.0	0.0	0.7	12.3	1.5	6.7	10.8	11.2
LnGrp Delay(d),s/veh	32.7	0.0	0.0	49.4	0.0	0.0	56.6	23.8	17.1	72.1	18.2	18.1
LnGrp LOS	C			D			E	C	B	E	B	B
Approach Vol, veh/h		17			370			1101			1207	
Approach Delay, s/veh		32.7			49.4			23.9			25.9	
Approach LOS		C			D			C			C	

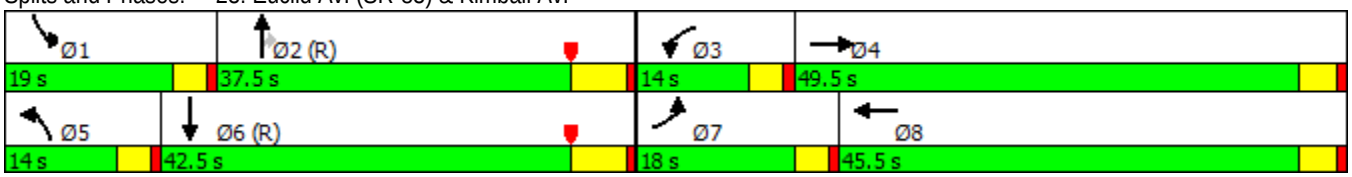
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.1	64.1		36.9	9.4	73.8		36.9
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	14.5	27.5		2.9	3.4	24.1		30.7
Green Ext Time (p_c), s	0.1	10.9		1.4	0.0	15.3		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.3
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	135	214	28	629	97	650	24	145	590
Future Volume (vph)	135	214	28	629	97	650	24	145	590
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	12.9	44.4	10.0	35.9	10.8	38.6	38.6	14.1	41.8
Actuated g/C Ratio	0.11	0.37	0.08	0.30	0.09	0.32	0.32	0.12	0.35
v/c Ratio	0.80	0.19	0.22	0.88	0.68	0.60	0.04	0.78	0.78
Control Delay	82.9	24.9	55.6	48.3	60.6	40.3	2.5	78.7	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.9	24.9	55.6	48.3	60.6	40.3	2.5	78.7	24.9
LOS	F	C	E	D	E	D	A	E	C
Approach Delay		45.8		48.5		41.7			32.4
Approach LOS		D		D		D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 41.1	Intersection LOS: D
Intersection Capacity Utilization 86.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	214	25	28	629	251	97	650	24	145	590	310
Future Volume (veh/h)	135	214	25	28	629	251	97	650	24	145	590	310
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	138	218	24	29	642	234	99	663	16	148	602	278
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	1061	116	84	720	262	130	1187	531	172	844	390
Arrive On Green	0.10	0.34	0.34	0.05	0.29	0.29	0.03	0.11	0.11	0.11	0.37	0.37
Sat Flow, veh/h	1619	3111	339	1619	2457	895	1619	3420	1530	1619	2265	1045
Grp Volume(v), veh/h	138	119	123	29	447	429	99	663	16	148	454	426
Grp Sat Flow(s),veh/h/ln	1619	1710	1740	1619	1710	1642	1619	1710	1530	1619	1710	1600
Q Serve(g_s), s	10.1	5.9	6.0	2.1	30.0	30.0	7.3	22.0	1.1	10.8	27.2	27.3
Cycle Q Clear(g_c), s	10.1	5.9	6.0	2.1	30.0	30.0	7.3	22.0	1.1	10.8	27.2	27.3
Prop In Lane	1.00		0.19	1.00		0.55	1.00		1.00	1.00		0.65
Lane Grp Cap(c), veh/h	162	583	594	84	501	481	130	1187	531	172	637	596
V/C Ratio(X)	0.85	0.20	0.21	0.35	0.89	0.89	0.76	0.56	0.03	0.86	0.71	0.71
Avail Cap(c_a), veh/h	189	641	653	135	584	561	135	1187	531	202	637	596
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	1.00	1.00	1.00	0.90	0.90	0.90	0.82	0.82	0.82
Uniform Delay (d), s/veh	53.2	28.0	28.0	54.9	40.6	40.6	57.3	44.4	35.2	52.8	32.1	32.2
Incr Delay (d2), s/veh	23.6	0.2	0.2	0.9	13.2	13.7	17.5	1.7	0.1	20.4	5.5	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	2.8	2.9	0.9	16.0	15.4	3.9	10.7	0.5	5.8	13.9	13.0
LnGrp Delay(d),s/veh	76.7	28.2	28.2	55.9	53.8	54.3	74.7	46.2	35.3	73.2	37.7	38.1
LnGrp LOS	E	C	C	E	D	D	E	D	D	E	D	D
Approach Vol, veh/h		380			905			778			1028	
Approach Delay, s/veh		45.8			54.1			49.6			42.9	
Approach LOS		D			D			D			D	

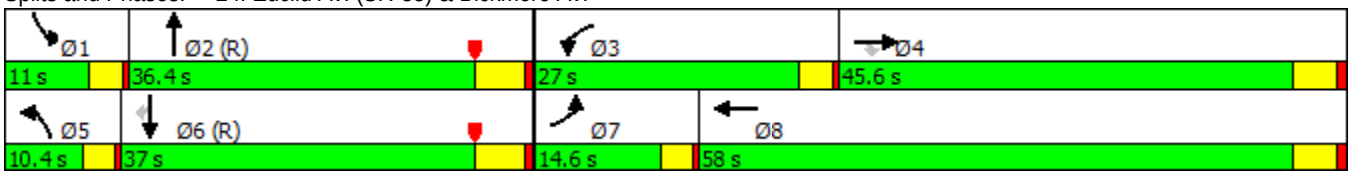
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	47.6	10.2	45.4	13.6	50.7	16.0	39.7
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	12.8	24.0	4.1	8.0	9.3	29.3	12.1	32.0
Green Ext Time (p_c), s	0.0	4.8	0.0	4.7	0.0	4.7	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	48.2
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	65	18	24	177	365	29	510	38	500	74
Future Volume (vph)	65	18	24	177	365	29	510	38	500	74
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.2	25.2	25.2	30.2	43.9	6.4	45.9	6.9	48.3	48.3
Actuated g/C Ratio	0.08	0.21	0.21	0.25	0.37	0.05	0.38	0.06	0.40	0.40
v/c Ratio	0.56	0.05	0.06	0.46	0.88	0.36	0.43	0.43	0.39	0.12
Control Delay	69.6	29.5	0.3	45.3	49.8	46.8	16.6	74.4	11.4	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.6	29.5	0.3	45.3	49.8	46.8	16.6	74.4	11.4	3.5
LOS	E	C	A	D	D	D	B	E	B	A
Approach Delay		47.1			48.7		18.2		14.3	
Approach LOS		D			D		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 29.5	Intersection LOS: C
Intersection Capacity Utilization 70.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	18	24	177	365	169	29	510	12	38	500	74
Future Volume (veh/h)	65	18	24	177	365	169	29	510	12	38	500	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	69	19	24	188	388	167	31	543	12	40	532	70
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	86	483	410	213	415	179	43	1448	32	50	1461	653
Arrive On Green	0.05	0.27	0.27	0.13	0.35	0.35	0.01	0.14	0.14	0.01	0.14	0.14
Sat Flow, veh/h	1619	1800	1528	1619	1195	514	1619	3421	76	1619	3420	1530
Grp Volume(v), veh/h	69	19	24	188	0	555	31	271	284	40	532	70
Grp Sat Flow(s),veh/h/ln	1619	1800	1528	1619	0	1709	1619	1710	1787	1619	1710	1530
Q Serve(g_s), s	5.1	0.9	1.4	13.7	0.0	37.7	2.3	17.3	17.3	3.0	16.9	4.8
Cycle Q Clear(g_c), s	5.1	0.9	1.4	13.7	0.0	37.7	2.3	17.3	17.3	3.0	16.9	4.8
Prop In Lane	1.00		1.00	1.00		0.30	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	86	483	410	213	0	593	43	724	756	50	1461	653
V/C Ratio(X)	0.80	0.04	0.06	0.88	0.00	0.94	0.71	0.37	0.38	0.81	0.36	0.11
Avail Cap(c_a), veh/h	150	609	517	317	0	755	93	724	756	101	1461	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	0.56	0.56	0.56
Uniform Delay (d), s/veh	56.2	32.4	32.6	51.2	0.0	37.9	59.0	37.2	37.2	59.0	36.8	31.6
Incr Delay (d2), s/veh	6.4	0.0	0.0	12.7	0.0	14.9	6.2	1.2	1.1	6.3	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.5	0.6	6.9	0.0	20.2	1.1	8.4	8.8	1.4	8.1	2.1
LnGrp Delay(d),s/veh	62.6	32.5	32.6	63.9	0.0	52.7	65.2	38.4	38.3	65.3	37.2	31.8
LnGrp LOS	E	C	C	E		D	E	D	D	E	D	C
Approach Vol, veh/h		112			743			586			642	
Approach Delay, s/veh		51.1			55.6			39.8			38.3	
Approach LOS		D			E			D			D	

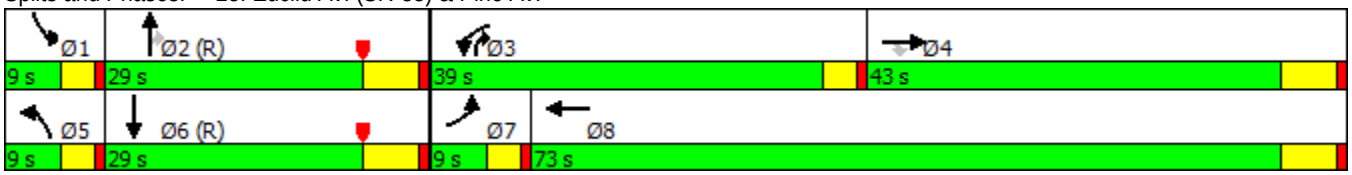
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	56.3	19.3	37.2	6.7	56.7	9.9	46.7
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	5.0	19.3	15.7	3.4	4.3	18.9	7.1	39.7
Green Ext Time (p_c), s	0.0	3.1	0.1	2.4	0.0	3.2	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	45.6
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	208	32	841	159	56	567	470	56	624
Future Volume (vph)	5	208	32	841	159	56	567	470	56	624
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	22.3	22.3	35.2	59.7	8.2	34.3	71.5	8.2	34.3
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.29	0.60	0.07	0.29
v/c Ratio	0.07	0.63	0.08	0.98	0.25	0.52	0.59	0.44	0.52	0.66
Control Delay	57.8	52.2	0.4	68.9	15.3	77.8	38.8	2.2	56.7	32.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.2	0.4	68.9	15.3	77.8	38.8	2.2	56.7	32.4
LOS	E	D	A	E	B	E	D	A	E	C
Approach Delay		45.6			58.0		25.1			34.4
Approach LOS		D			E		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 40.0	Intersection LOS: D
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	208	32	841	159	56	56	567	470	56	624	14
Future Volume (veh/h)	5	208	32	841	159	56	56	567	470	56	624	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	210	0	849	161	42	57	573	297	57	630	9
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	277	235	862	603	157	67	1184	964	67	1195	17
Arrive On Green	0.01	0.15	0.00	0.29	0.44	0.44	0.04	0.35	0.35	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1373	358	1619	3420	1496	1619	3451	49
Grp Volume(v), veh/h	5	210	0	849	0	203	57	573	297	57	312	327
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1731	1619	1710	1496	1619	1710	1790
Q Serve(g_s), s	0.4	13.4	0.0	34.2	0.0	8.9	4.2	15.8	10.8	4.2	20.6	20.7
Cycle Q Clear(g_c), s	0.4	13.4	0.0	34.2	0.0	8.9	4.2	15.8	10.8	4.2	20.6	20.7
Prop In Lane	1.00		1.00	1.00		0.21	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	277	235	862	0	760	67	1184	964	67	592	620
V/C Ratio(X)	0.48	0.76	0.00	0.98	0.00	0.27	0.84	0.48	0.31	0.84	0.53	0.53
Avail Cap(c_a), veh/h	67	555	472	862	0	967	67	1184	964	67	592	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.71	0.71	0.71	0.92	0.92	0.92
Uniform Delay (d), s/veh	59.4	48.6	0.0	42.2	0.0	21.4	57.1	30.8	9.8	58.8	43.9	43.9
Incr Delay (d2), s/veh	12.4	6.0	0.0	26.7	0.0	0.3	45.1	1.0	0.6	54.1	3.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.1	0.0	17.1	0.0	4.3	2.7	7.6	4.6	2.9	10.3	10.8
LnGrp Delay(d),s/veh	71.8	54.6	0.0	69.0	0.0	21.6	102.2	31.8	10.4	112.9	47.0	46.9
LnGrp LOS	E	D		E		C	F	C	B	F	D	D
Approach Vol, veh/h		215			1052			927			696	
Approach Delay, s/veh		55.0			59.8			29.3			52.3	
Approach LOS		D			E			C			D	

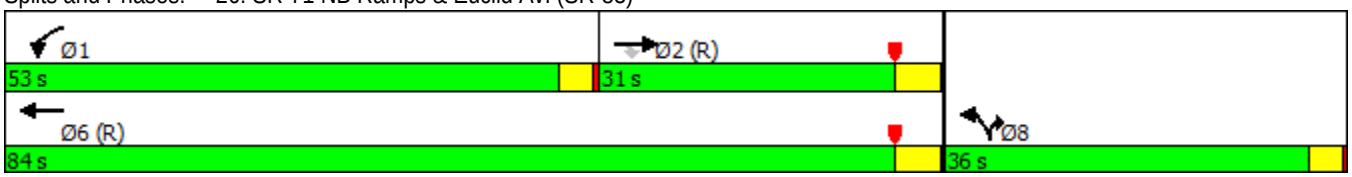
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	47.5	39.0	24.5	9.0	47.5	4.8	58.7
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	6.2	17.8	36.2	15.4	6.2	22.7	2.4	10.9
Green Ext Time (p_c), s	0.0	2.4	0.0	3.0	0.0	0.2	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	47.9
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	483	289	552	935	69	642
Future Volume (vph)	483	289	552	935	69	642
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	31.0	31.0	53.0	84.0	36.0	36.0
Total Split (%)	25.8%	25.8%	44.2%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	50.2	50.2	44.6	98.3	13.7	13.7
Actuated g/C Ratio	0.42	0.42	0.37	0.82	0.11	0.11
v/c Ratio	0.35	0.37	0.91	0.35	0.19	0.87
Control Delay	47.5	23.7	47.0	0.3	45.6	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	23.7	47.0	0.3	45.6	16.4
LOS	D	C	D	A	D	B
Approach Delay	38.6			17.6	19.2	
Approach LOS	D			B	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 23.5	Intersection LOS: C
Intersection Capacity Utilization 63.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	483	289	552	935	69	642
Future Volume (veh/h)	483	289	552	935	69	642
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	503	0	575	974	72	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1752	784	600	3050	139	64
Arrive On Green	1.00	0.00	0.35	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	503	0	575	974	72	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	39.4	5.2	2.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	39.4	5.2	2.5	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1752	784	600	3050	139	64
V/C Ratio(X)	0.29	0.00	0.96	0.32	0.52	0.00
Avail Cap(c_a), veh/h	1752	784	707	3050	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.45	0.45	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	38.1	1.0	56.3	0.0
Incr Delay (d2), s/veh	0.4	0.0	12.3	0.1	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	20.6	2.4	1.2	0.0
LnGrp Delay(d),s/veh	0.4	0.0	50.4	1.1	59.3	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	503			1549	72	
Approach Delay, s/veh	0.4			19.4	59.3	
Approach LOS	A			B	E	

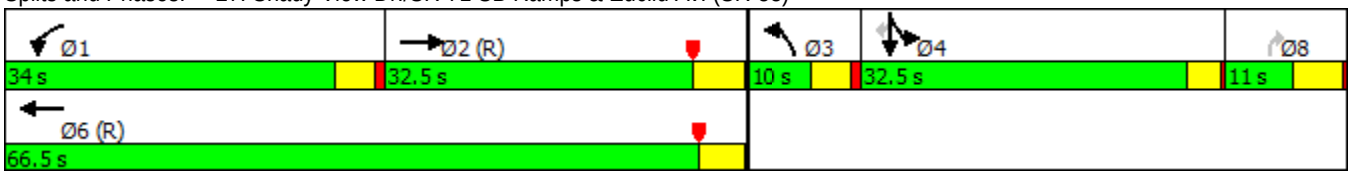
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	45.5	66.0				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	49.5	26.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	41.4	2.0				7.2		4.5
Green Ext Time (p_c), s	0.7	8.7				10.3		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	742	381	204	60	288	256	20	35
Future Volume (vph)	742	381	204	60	288	256	20	35
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	32.5	34.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	27.1%	28.3%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	29.3	37.3	71.7	5.5	7.1	18.2	18.2	18.2
Actuated g/C Ratio	0.24	0.31	0.60	0.05	0.06	0.15	0.15	0.15
v/c Ratio	1.00	0.83	0.11	0.89	0.82	0.66	0.61	0.11
Control Delay	76.3	62.7	4.4	134.9	23.4	60.1	56.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	62.7	4.4	134.9	23.4	60.1	56.7	0.6
LOS	E	E	A	F	C	E	E	A
Approach Delay	76.3		42.4				51.9	
Approach LOS	E		D				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 56.7	Intersection LOS: E
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	742	16	381	204	0	60	0	288	256	20	35
Future Volume (veh/h)	0	742	16	381	204	0	60	0	288	256	20	35
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	815	18	419	224	0	66	0	316	297	0	38
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1818	40	398	2787	0	0	0	0	370	0	175
Arrive On Green	0.00	0.53	0.53	0.41	1.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11
Sat Flow, veh/h	0	3511	76	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	407	426	419	224	0		0.0		297	0	38
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	17.6	17.6	29.5	0.0	0.0				10.7	0.0	2.7
Cycle Q Clear(g_c), s	0.0	17.6	17.6	29.5	0.0	0.0				10.7	0.0	2.7
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	909	950	398	2787	0				370	0	175
V/C Ratio(X)	0.00	0.45	0.45	1.05	0.08	0.00				0.80	0.00	0.22
Avail Cap(c_a), veh/h	0	909	950	398	2787	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.3	17.3	35.4	0.0	0.0				51.8	0.0	48.3
Incr Delay (d2), s/veh	0.0	1.6	1.5	59.6	0.1	0.0				4.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.7	9.0	19.7	0.0	0.0				5.0	0.0	1.2
LnGrp Delay(d),s/veh	0.0	18.9	18.8	95.0	0.1	0.0				55.9	0.0	48.9
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		833			643						335	
Approach Delay, s/veh		18.9			61.9						55.1	
Approach LOS		B			E						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	34.0	68.8		17.2		102.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	29.5	27.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	31.5	19.6		12.7		2.0		
Green Ext Time (p_c), s	0.0	2.7		1.0		4.3		

Intersection Summary	
HCM 2010 Ctrl Delay	40.9
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	397	0	0	1021	0	0	0	0	1	0	0
Future Vol, veh/h	3	397	0	0	1021	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	436	0	0	1122	0	0	0	0	1	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	1122	0	-	-	-	0				1565	1565	1122
Stage 1	-	-	-	-	-	-				1122	1122	-
Stage 2	-	-	-	-	-	-				443	443	-
Critical Hdwy	4.1	-	-	-	-	-				6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	630	-	0	0	-	-				124	113	253
Stage 1	-	-	0	0	-	-				314	284	-
Stage 2	-	-	0	0	-	-				651	579	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	630	-	-	-	-	-				123	0	253
Mov Cap-2 Maneuver	-	-	-	-	-	-				240	0	-
Stage 1	-	-	-	-	-	-				314	0	-
Stage 2	-	-	-	-	-	-				648	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	20.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	630	-	-	-	240
HCM Lane V/C Ratio	0.005	-	-	-	0.005
HCM Control Delay (s)	10.7	-	-	-	20.1
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	389	20	11	1039	15	20
Future Vol, veh/h	389	20	11	1039	15	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	405	21	11	1082	16	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	426	0	1521	213
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	1105	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1144	-	121	798
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	320	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1144	-	120	798
Mov Cap-2 Maneuver	-	-	-	-	283	-
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	317	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	283	798	-	-	1144	-
HCM Lane V/C Ratio	0.055	0.026	-	-	0.01	-
HCM Control Delay (s)	18.5	9.6	-	-	8.2	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	352	23	900	149	18
Future Volume (vph)	352	23	900	149	18
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	30.2	5.1	33.8	10.2	10.2
Actuated g/C Ratio	0.55	0.09	0.61	0.18	0.18
v/c Ratio	0.24	0.17	0.90	0.55	0.07
Control Delay	7.0	28.5	22.5	31.5	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	28.5	22.5	31.5	11.2
LOS	A	C	C	C	B
Approach Delay	7.0		22.7	29.3	
Approach LOS	A		C	C	

Intersection Summary		
Cycle Length: 60		
Actuated Cycle Length: 55.4		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 19.1	Intersection LOS: B	
Intersection Capacity Utilization 68.6%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	352	57	23	900	149	18
Future Volume (veh/h)	352	57	23	900	149	18
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	387	63	25	989	164	17
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1488	240	47	1112	291	275
Arrive On Green	0.51	0.51	0.03	0.62	0.18	0.18
Sat Flow, veh/h	3030	474	1619	1800	1619	1530
Grp Volume(v), veh/h	224	226	25	989	164	17
Grp Sat Flow(s),veh/h/ln	1710	1704	1619	1800	1619	1530
Q Serve(g_s), s	4.1	4.2	0.8	26.0	5.2	0.5
Cycle Q Clear(g_c), s	4.1	4.2	0.8	26.0	5.2	0.5
Prop In Lane		0.28	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	866	863	47	1112	291	275
V/C Ratio(X)	0.26	0.26	0.54	0.89	0.56	0.06
Avail Cap(c_a), veh/h	893	890	145	1251	291	275
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.8	7.8	26.7	9.0	20.9	19.0
Incr Delay (d2), s/veh	0.2	0.2	3.5	7.6	7.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.0	0.4	15.0	2.9	0.2
LnGrp Delay(d),s/veh	8.0	8.0	30.2	16.6	28.6	19.4
LnGrp LOS	A	A	C	B	C	B
Approach Vol, veh/h	450			1014	181	
Approach Delay, s/veh	8.0			17.0	27.7	
Approach LOS	A			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.2	34.4				40.6		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	2.8	6.2				28.0		7.2
Green Ext Time (p_c), s	0.0	10.2				6.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	272	61	716	207	65
Future Volume (vph)	272	61	716	207	65
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	22.0	5.4	27.5	13.7	13.7
Actuated g/C Ratio	0.42	0.10	0.53	0.26	0.26
v/c Ratio	0.33	0.41	0.85	0.55	0.18
Control Delay	11.6	33.3	20.0	25.6	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	33.3	20.0	25.6	16.2
LOS	B	C	B	C	B
Approach Delay	11.6		21.0	23.4	
Approach LOS	B		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 61.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	272	123	61	716	207	65
Future Volume (veh/h)	272	123	61	716	207	65
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	306	138	69	804	233	55
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	888	390	98	965	416	393
Arrive On Green	0.39	0.39	0.06	0.54	0.26	0.26
Sat Flow, veh/h	2382	1007	1619	1800	1619	1530
Grp Volume(v), veh/h	226	218	69	804	233	55
Grp Sat Flow(s),veh/h/ln	1710	1589	1619	1800	1619	1530
Q Serve(g_s), s	4.9	5.1	2.2	19.5	6.5	1.4
Cycle Q Clear(g_c), s	4.9	5.1	2.2	19.5	6.5	1.4
Prop In Lane		0.63	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	663	616	98	965	416	393
V/C Ratio(X)	0.34	0.35	0.70	0.83	0.56	0.14
Avail Cap(c_a), veh/h	845	786	168	1235	416	393
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	11.3	24.1	10.1	16.8	15.0
Incr Delay (d2), s/veh	0.3	0.3	3.4	4.0	5.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.2	1.1	10.5	3.5	0.7
LnGrp Delay(d),s/veh	11.6	11.7	27.5	14.1	22.2	15.7
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	444			873	288	
Approach Delay, s/veh	11.6			15.2	21.0	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.8	26.4				34.2		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.2	7.1				21.5		8.5
Green Ext Time (p_c), s	0.0	7.4				6.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	79	249	8	5	724	113	14	19	17	38	12	39
Future Vol, veh/h	79	249	8	5	724	113	14	19	17	38	12	39
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	83	262	8	5	762	119	15	20	18	40	13	41

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	882	0	0	273	0	0	1294	1328	138	1141	1272	823
Stage 1	-	-	-	-	-	-	435	435	-	833	833	-
Stage 2	-	-	-	-	-	-	859	893	-	308	439	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	775	-	-	1302	-	-	131	157	891	168	169	377
Stage 1	-	-	-	-	-	-	575	584	-	366	386	-
Stage 2	-	-	-	-	-	-	354	363	-	683	582	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	775	-	-	1301	-	-	103	139	888	140	150	377
Mov Cap-2 Maneuver	-	-	-	-	-	-	178	220	-	246	267	-
Stage 1	-	-	-	-	-	-	512	520	-	326	384	-
Stage 2	-	-	-	-	-	-	304	361	-	574	519	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0	21.4	22.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	272	775	-	-	1301	-	-	294
HCM Lane V/C Ratio	0.193	0.107	-	-	0.004	-	-	0.319
HCM Control Delay (s)	21.4	10.2	-	-	7.8	-	-	22.9
HCM Lane LOS	C	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0.4	-	-	0	-	-	1.3

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	290	14	24	788	54	21
Future Vol, veh/h	290	14	24	788	54	21
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	319	15	26	866	59	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	335	0	1246	168
Stage 1	-	-	-	-	327	-
Stage 2	-	-	-	-	919	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1236	-	181	853
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	392	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1236	-	177	852
Mov Cap-2 Maneuver	-	-	-	-	345	-
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	384	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	414	-	-	1236	-
HCM Lane V/C Ratio	0.199	-	-	0.021	-
HCM Control Delay (s)	15.8	-	-	8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	94.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	311	0	0	0	0	0	812	0	0
Future Vol, veh/h	0	0	0	311	0	0	0	0	0	812	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	334	0	0	0	0	0	873	0	0
Number of Lanes	0	0	0	1	0	0	0	0	0	1	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay	13.8	125.1
HCM LOS	B	F

Lane	NBLn1	EBLn1
Vol Left, %	100%	0%
Vol Thru, %	0%	0%
Vol Right, %	0%	100%
Sign Control	Stop	Stop
Traffic Vol by Lane	812	311
LT Vol	812	0
Through Vol	0	0
RT Vol	0	311
Lane Flow Rate	873	334
Geometry Grp	1	1
Degree of Util (X)	1.208	0.482
Departure Headway (Hd)	4.98	5.661
Convergence, Y/N	Yes	Yes
Cap	725	642
Service Time	3.049	3.661
HCM Lane V/C Ratio	1.204	0.52
HCM Control Delay	125.1	13.8
HCM Lane LOS	F	B
HCM 95th-tile Q	29.5	2.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

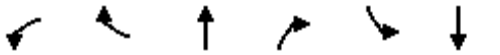
Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	0	0
Future Vol, veh/h	0	0	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	0	0
Number of Lanes	0	0	0	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	367	694	670	277	168	399
Future Volume (vph)	367	694	670	277	168	399
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Detector Phase	8	1	2	8	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0
Total Split (s)	36.3	27.0	56.7	36.3	27.0	83.7
Total Split (%)	30.3%	22.5%	47.3%	30.3%	22.5%	69.8%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	Min	None	None	Min
Act Effct Green (s)	25.4	48.7	42.9	68.2	17.8	66.2
Actuated g/C Ratio	0.25	0.48	0.42	0.67	0.17	0.65
v/c Ratio	0.86	0.87	0.88	0.25	0.56	0.34
Control Delay	58.1	32.9	42.5	1.1	49.3	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	32.9	42.5	1.1	49.3	9.3
LOS	E	C	D	A	D	A
Approach Delay	41.6		30.4			21.2
Approach LOS	D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 102.5	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 86.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	367	694	670	277	168	399
Future Volume (veh/h)	367	694	670	277	168	399
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	382	658	698	289	175	416
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	553	682	805	1164	211	1120
Arrive On Green	0.31	0.31	0.42	0.42	0.12	0.59
Sat Flow, veh/h	1810	1615	1900	1581	1810	1900
Grp Volume(v), veh/h	382	658	698	289	175	416
Grp Sat Flow(s),veh/h/ln	1810	1615	1900	1581	1810	1900
Q Serve(g_s), s	18.8	31.0	33.9	6.1	9.6	11.7
Cycle Q Clear(g_c), s	18.8	31.0	33.9	6.1	9.6	11.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	553	682	805	1164	211	1120
V/C Ratio(X)	0.69	0.96	0.87	0.25	0.83	0.37
Avail Cap(c_a), veh/h	553	682	963	1296	393	1475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	28.5	26.6	4.5	43.8	10.9
Incr Delay (d2), s/veh	3.1	25.8	7.6	0.1	8.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	22.7	19.4	5.7	5.3	6.1
LnGrp Delay(d),s/veh	34.0	54.3	34.2	4.7	52.0	11.0
LnGrp LOS	C	D	C	A	D	B
Approach Vol, veh/h	1040		987			591
Approach Delay, s/veh	46.9		25.6			23.1
Approach LOS	D		C			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	16.8	48.3				65.1		36.3
Change Period (Y+Rc), s	5.0	5.3				* 5.3		5.3
Max Green Setting (Gmax), s	22.0	51.4				* 79		31.0
Max Q Clear Time (g_c+I1), s	11.6	35.9				13.7		33.0
Green Ext Time (p_c), s	0.3	7.0				10.4		0.0

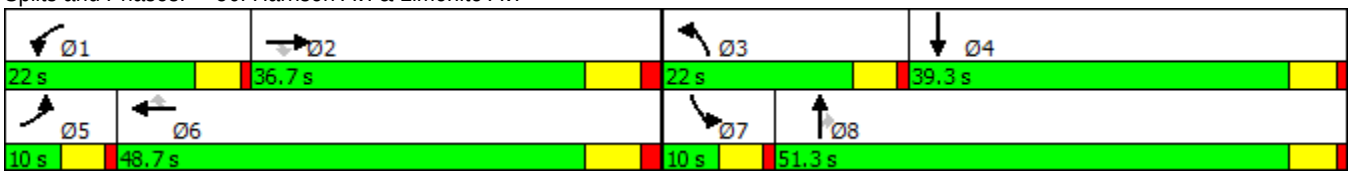
Intersection Summary	
HCM 2010 Ctrl Delay	33.5
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	19	413	14	134	880	5	128	58	223	22	74
Future Volume (vph)	19	413	14	134	880	5	128	58	223	22	74
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	10.0	36.7	36.7	22.0	48.7	48.7	22.0	51.3	51.3	10.0	39.3
Total Split (%)	8.3%	30.6%	30.6%	18.3%	40.6%	40.6%	18.3%	42.8%	42.8%	8.3%	32.8%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	5.5	15.7	15.7	10.7	29.0	29.0	10.5	26.1	26.1	5.5	13.0
Actuated g/C Ratio	0.07	0.21	0.21	0.14	0.39	0.39	0.14	0.35	0.35	0.07	0.17
v/c Ratio	0.16	0.41	0.03	0.57	0.68	0.01	0.55	0.10	0.34	0.18	0.41
Control Delay	47.2	27.9	0.1	44.4	24.5	0.0	44.1	21.1	4.9	47.5	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	27.9	0.1	44.4	24.5	0.0	44.1	21.1	4.9	47.5	28.0
LOS	D	C	A	D	C	A	D	C	A	D	C
Approach Delay		27.9			27.0			19.5			30.9
Approach LOS		C			C			B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 74.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 25.9	Intersection LOS: C
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	413	14	134	880	5	128	58	223	22	74	53
Future Volume (veh/h)	19	413	14	134	880	5	128	58	223	22	74	53
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	21	449	13	146	957	5	139	63	208	24	80	37
Adj No. of Lanes	1	3	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	44	1701	530	186	1467	642	178	372	316	49	152	70
Arrive On Green	0.02	0.33	0.33	0.10	0.41	0.41	0.10	0.20	0.20	0.03	0.12	0.12
Sat Flow, veh/h	1810	5187	1615	1810	3610	1581	1810	1900	1613	1810	1223	565
Grp Volume(v), veh/h	21	449	13	146	957	5	139	63	208	24	0	117
Grp Sat Flow(s),veh/h/ln	1810	1729	1615	1810	1805	1581	1810	1900	1613	1810	0	1788
Q Serve(g_s), s	0.7	4.1	0.4	5.1	13.8	0.1	4.8	1.8	7.7	0.8	0.0	3.9
Cycle Q Clear(g_c), s	0.7	4.1	0.4	5.1	13.8	0.1	4.8	1.8	7.7	0.8	0.0	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	44	1701	530	186	1467	642	178	372	316	49	0	223
V/C Ratio(X)	0.48	0.26	0.02	0.79	0.65	0.01	0.78	0.17	0.66	0.49	0.00	0.53
Avail Cap(c_a), veh/h	141	2394	745	478	2339	1025	478	1358	1153	141	0	945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.0	15.9	14.7	28.2	15.4	11.4	28.3	21.5	23.9	30.9	0.0	26.4
Incr Delay (d2), s/veh	3.0	0.1	0.0	2.8	0.5	0.0	2.8	0.2	2.3	2.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.0	0.2	2.7	6.9	0.1	2.5	0.9	3.6	0.5	0.0	2.1
LnGrp Delay(d),s/veh	33.9	16.0	14.7	30.9	15.9	11.4	31.2	21.7	26.2	33.6	0.0	28.3
LnGrp LOS	C	B	B	C	B	B	C	C	C	C		C
Approach Vol, veh/h		483			1108			410			141	
Approach Delay, s/veh		16.7			17.9			27.2			29.2	
Approach LOS		B			B			C			C	

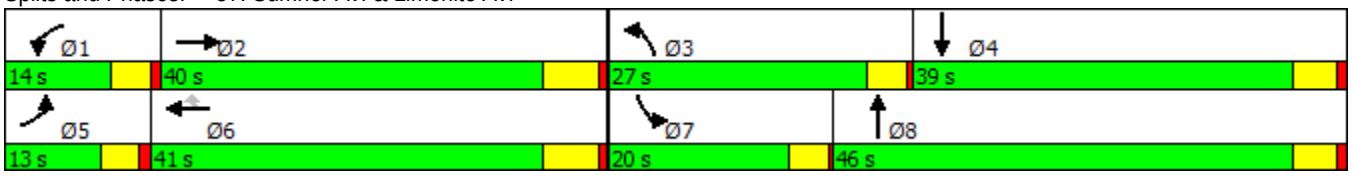
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.6	28.1	11.3	13.3	6.6	33.1	6.7	17.9
Change Period (Y+Rc), s	5.0	7.0	5.0	5.3	5.0	7.0	5.0	5.3
Max Green Setting (Gmax), s	17.0	29.7	17.0	34.0	5.0	41.7	5.0	46.0
Max Q Clear Time (g_c+I1), s	7.1	6.1	6.8	5.9	2.7	15.8	2.8	9.7
Green Ext Time (p_c), s	0.1	10.0	0.1	1.6	0.0	10.4	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	74	577	92	696	16	141	156	93	103
Future Volume (vph)	74	577	92	696	16	141	156	93	103
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	1	6		3	8	7	4
Permitted Phases					6				
Detector Phase	5	2	1	6	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	13.0	40.0	14.0	41.0	41.0	27.0	46.0	20.0	39.0
Total Split (%)	10.8%	33.3%	11.7%	34.2%	34.2%	22.5%	38.3%	16.7%	32.5%
Yellow Time (s)	3.5	5.0	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.1	16.6	6.4	16.9	16.9	10.3	15.5	8.3	10.4
Actuated g/C Ratio	0.10	0.27	0.10	0.27	0.27	0.16	0.25	0.13	0.17
v/c Ratio	0.24	0.47	0.28	0.54	0.03	0.52	0.39	0.42	0.30
Control Delay	34.8	22.7	34.5	23.2	0.1	35.5	11.6	36.4	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	22.7	34.5	23.2	0.1	35.5	11.6	36.4	16.6
LOS	C	C	C	C	A	D	B	D	B
Approach Delay		24.1		24.1			18.4		23.5
Approach LOS		C		C			B		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 62.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 22.8	Intersection LOS: C
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	577	26	92	696	16	141	156	197	93	103	71
Future Volume (veh/h)	74	577	26	92	696	16	141	156	197	93	103	71
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	80	620	20	99	748	11	152	168	138	100	111	49
Adj No. of Lanes	2	3	0	2	3	1	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	184	1711	55	204	1749	544	196	323	248	129	322	134
Arrive On Green	0.05	0.33	0.33	0.06	0.34	0.34	0.11	0.17	0.17	0.07	0.13	0.13
Sat Flow, veh/h	3510	5163	166	3510	5187	1615	1810	1933	1481	1810	2472	1032
Grp Volume(v), veh/h	80	415	225	99	748	11	152	156	150	100	79	81
Grp Sat Flow(s),veh/h/ln	1755	1729	1871	1755	1729	1615	1810	1805	1609	1810	1805	1699
Q Serve(g_s), s	1.2	4.8	4.8	1.4	5.9	0.2	4.3	4.1	4.5	2.8	2.1	2.3
Cycle Q Clear(g_c), s	1.2	4.8	4.8	1.4	5.9	0.2	4.3	4.1	4.5	2.8	2.1	2.3
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.92	1.00		0.61
Lane Grp Cap(c), veh/h	184	1146	620	204	1749	544	196	302	269	129	235	221
V/C Ratio(X)	0.43	0.36	0.36	0.48	0.43	0.02	0.77	0.52	0.56	0.77	0.34	0.36
Avail Cap(c_a), veh/h	569	2241	1212	636	3461	1077	793	1411	1258	552	1170	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.1	13.3	13.3	23.9	13.5	11.6	22.8	19.9	20.1	23.9	20.8	20.8
Incr Delay (d2), s/veh	0.6	0.2	0.4	0.7	0.2	0.0	2.5	1.0	1.3	3.6	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.3	2.5	0.7	2.8	0.1	2.3	2.1	2.1	1.5	1.1	1.1
LnGrp Delay(d),s/veh	24.7	13.5	13.7	24.6	13.6	11.6	25.2	20.9	21.4	27.6	21.4	21.6
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		720			858			458			260	
Approach Delay, s/veh		14.8			14.9			22.5			23.8	
Approach LOS		B			B			C			C	

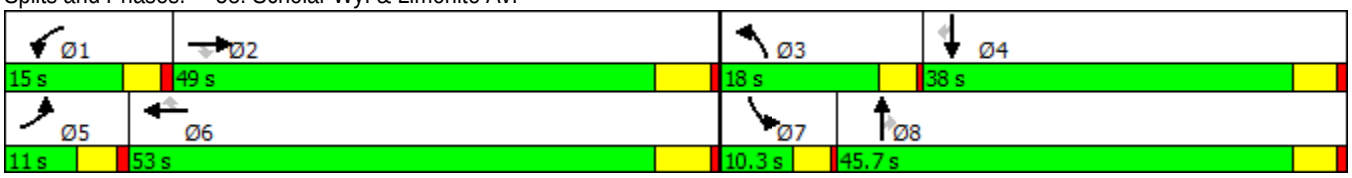
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	23.4	9.7	11.8	7.3	23.7	7.8	13.8
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	9.5	34.0	23.0	34.0	8.5	35.0	16.0	41.0
Max Q Clear Time (g_c+I1), s	3.4	6.8	6.3	4.3	3.2	7.9	4.8	6.5
Green Ext Time (p_c), s	0.0	9.8	0.1	2.1	0.0	9.8	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	830	65	66	636	16	92	108	161	29	143	43
Future Volume (vph)	25	830	65	66	636	16	92	108	161	29	143	43
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	11.0	49.0	49.0	15.0	53.0	53.0	18.0	45.7	45.7	10.3	38.0	38.0
Total Split (%)	9.2%	40.8%	40.8%	12.5%	44.2%	44.2%	15.0%	38.1%	38.1%	8.6%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	5.9	27.1	27.1	7.7	32.9	32.9	9.1	18.7	18.7	6.0	11.9	11.9
Actuated g/C Ratio	0.08	0.38	0.38	0.11	0.46	0.46	0.13	0.26	0.26	0.08	0.17	0.17
v/c Ratio	0.18	0.66	0.10	0.37	0.41	0.02	0.43	0.24	0.32	0.21	0.26	0.12
Control Delay	45.1	23.8	0.3	44.5	16.5	0.1	43.2	25.8	6.4	45.4	31.2	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	23.8	0.3	44.5	16.5	0.1	43.2	25.8	6.4	45.4	31.2	0.7
LOS	D	C	A	D	B	A	D	C	A	D	C	A
Approach Delay		22.7			18.7			21.6			27.0	
Approach LOS		C			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 71.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	830	65	66	636	16	92	108	161	29	143	43
Future Volume (veh/h)	25	830	65	66	636	16	92	108	161	29	143	43
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	27	902	62	72	691	17	100	117	135	32	155	45
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	44	1567	701	92	1664	745	130	314	267	50	438	185
Arrive On Green	0.02	0.43	0.43	0.05	0.46	0.46	0.07	0.17	0.17	0.03	0.12	0.12
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1612	1810	3610	1524
Grp Volume(v), veh/h	27	902	62	72	691	17	100	117	135	32	155	45
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1612	1810	1805	1524
Q Serve(g_s), s	0.9	11.4	1.4	2.4	7.7	0.3	3.3	3.3	4.6	1.1	2.4	1.6
Cycle Q Clear(g_c), s	0.9	11.4	1.4	2.4	7.7	0.3	3.3	3.3	4.6	1.1	2.4	1.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	44	1567	701	92	1664	745	130	314	267	50	438	185
V/C Ratio(X)	0.62	0.58	0.09	0.78	0.42	0.02	0.77	0.37	0.51	0.64	0.35	0.24
Avail Cap(c_a), veh/h	194	2563	1147	314	2801	1253	418	1277	1083	188	1967	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	12.9	10.1	28.4	10.9	8.9	27.6	22.5	23.0	29.2	24.4	24.1
Incr Delay (d2), s/veh	5.2	0.3	0.1	5.3	0.2	0.0	3.6	0.5	1.1	5.1	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.7	0.6	1.3	3.9	0.2	1.8	1.8	2.1	0.6	1.2	0.7
LnGrp Delay(d),s/veh	34.5	13.3	10.1	33.7	11.0	8.9	31.3	23.0	24.1	34.2	24.8	24.6
LnGrp LOS	C	B	B	C	B	A	C	C	C	C	C	C
Approach Vol, veh/h		991			780			352			232	
Approach Delay, s/veh		13.6			13.1			25.8			26.1	
Approach LOS		B			B			C			C	

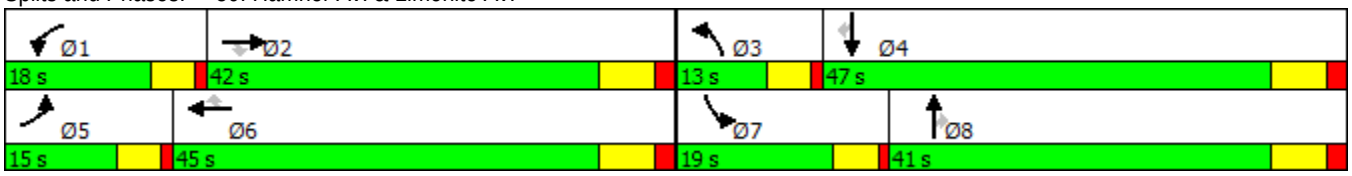
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	32.3	8.3	12.3	6.0	33.9	5.7	15.0
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	10.5	43.0	14.0	33.0	6.5	47.0	6.3	40.7
Max Q Clear Time (g_c+I1), s	4.4	13.4	5.3	4.4	2.9	9.7	3.1	6.6
Green Ext Time (p_c), s	0.0	12.9	0.0	1.6	0.0	14.1	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	16.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	785	29	218	458	106	120	450	410	250	251	117
Future Volume (vph)	152	785	29	218	458	106	120	450	410	250	251	117
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0
Total Split (s)	15.0	42.0	42.0	18.0	45.0	45.0	13.0	41.0	41.0	19.0	47.0	47.0
Total Split (%)	12.5%	35.0%	35.0%	15.0%	37.5%	37.5%	10.8%	34.2%	34.2%	15.8%	39.2%	39.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	8.2	26.5	26.5	10.2	28.5	28.5	7.0	25.0	25.0	11.0	29.0	29.0
Actuated g/C Ratio	0.08	0.27	0.27	0.10	0.29	0.29	0.07	0.26	0.26	0.11	0.30	0.30
v/c Ratio	0.54	0.58	0.05	0.62	0.45	0.19	0.49	0.35	0.74	0.65	0.24	0.22
Control Delay	54.2	33.6	0.2	53.0	30.9	1.2	55.5	31.1	24.2	52.8	27.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.2	33.6	0.2	53.0	30.9	1.2	55.5	31.1	24.2	52.8	27.1	5.5
LOS	D	C	A	D	C	A	E	C	C	D	C	A
Approach Delay		35.8			33.0			31.2			33.4	
Approach LOS		D			C			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 97.7	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 33.4	Intersection LOS: C
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	785	29	218	458	106	120	450	410	250	251	117
Future Volume (veh/h)	152	785	29	218	458	106	120	450	410	250	251	117
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	157	809	24	225	472	71	124	464	305	258	259	68
Adj No. of Lanes	2	3	1	2	2	1	2	3	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	225	1516	471	296	1128	503	188	1470	450	329	1169	521
Arrive On Green	0.06	0.29	0.29	0.08	0.31	0.31	0.05	0.28	0.28	0.09	0.32	0.32
Sat Flow, veh/h	3510	5187	1612	3510	3610	1610	3510	5187	1586	3510	3610	1611
Grp Volume(v), veh/h	157	809	24	225	472	71	124	464	305	258	259	68
Grp Sat Flow(s),veh/h/ln	1755	1729	1612	1755	1805	1610	1755	1729	1586	1755	1805	1611
Q Serve(g_s), s	4.3	12.8	1.0	6.1	10.1	3.1	3.4	6.9	16.6	7.0	5.1	2.9
Cycle Q Clear(g_c), s	4.3	12.8	1.0	6.1	10.1	3.1	3.4	6.9	16.6	7.0	5.1	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	225	1516	471	296	1128	503	188	1470	450	329	1169	521
V/C Ratio(X)	0.70	0.53	0.05	0.76	0.42	0.14	0.66	0.32	0.68	0.78	0.22	0.13
Avail Cap(c_a), veh/h	360	1862	579	468	1407	628	288	1809	553	504	1481	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	28.9	24.8	43.7	26.5	24.1	45.3	27.5	31.0	43.2	24.0	23.3
Incr Delay (d2), s/veh	1.5	0.6	0.1	1.5	0.5	0.3	1.5	0.3	4.2	2.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	6.2	0.5	3.0	5.1	1.4	1.7	3.3	7.8	3.5	2.6	1.3
LnGrp Delay(d),s/veh	46.2	29.6	24.9	45.2	27.0	24.4	46.7	27.7	35.2	45.2	24.2	23.5
LnGrp LOS	D	C	C	D	C	C	D	C	D	D	C	C
Approach Vol, veh/h		990			768			893			585	
Approach Delay, s/veh		32.1			32.1			32.9			33.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	35.5	10.2	38.6	11.2	37.5	14.1	34.6
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	13.0	35.0	8.0	40.0	10.0	38.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	8.1	14.8	5.4	7.1	6.3	12.1	9.0	18.6
Green Ext Time (p_c), s	0.1	13.6	0.0	13.4	0.1	16.2	0.1	8.7

Intersection Summary	
HCM 2010 Ctrl Delay	32.6
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1104	441	661	559	156	2	425
Future Volume (vph)	1104	441	661	559	156	2	425
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	36.5	23.5	23.5	23.5
Total Split (s)	52.5	52.5	34.0	86.5	23.5	23.5	23.5
Total Split (%)	47.7%	47.7%	30.9%	78.6%	21.4%	21.4%	21.4%
Yellow Time (s)	4.5	4.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	Min	Min	Min
Act Effct Green (s)	54.2	54.2	26.3	85.0	14.0	14.0	14.0
Actuated g/C Ratio	0.49	0.49	0.24	0.77	0.13	0.13	0.13
v/c Ratio	0.68	0.48	0.87	0.22	0.71	0.63	0.60
Control Delay	25.1	5.1	31.2	2.9	63.1	15.3	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	5.1	31.2	2.9	63.1	15.3	11.9
LOS	C	A	C	A	E	B	B
Approach Delay	19.4			18.2		25.5	
Approach LOS	B			B		C	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 59 (54%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 20.0	Intersection LOS: C
Intersection Capacity Utilization 71.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1104	441	661	559	0	0	0	0	156	2	425
Future Volume (veh/h)	0	1104	441	661	559	0	0	0	0	156	2	425
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1213	484	726	614	0				115	0	430
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1742	769	792	2704	0				273	0	487
Arrive On Green	0.00	0.48	0.48	0.30	1.00	0.00				0.15	0.00	0.15
Sat Flow, veh/h	0	3705	1595	3510	3705	0				1810	0	3230
Grp Volume(v), veh/h	0	1213	484	726	614	0				115	0	430
Grp Sat Flow(s),veh/h/ln	0	1805	1595	1755	1805	0				1810	0	1615
Q Serve(g_s), s	0.0	28.8	24.8	22.0	0.1	0.0				6.3	0.0	14.3
Cycle Q Clear(g_c), s	0.0	28.8	24.8	22.0	0.1	0.0				6.3	0.0	14.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1742	769	792	2704	0				273	0	487
V/C Ratio(X)	0.00	0.70	0.63	0.92	0.23	0.00				0.42	0.00	0.88
Avail Cap(c_a), veh/h	0	1742	769	941	2704	0				296	0	529
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.73	0.73	0.62	0.62	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.2	21.1	37.5	0.1	0.0				42.3	0.0	45.7
Incr Delay (d2), s/veh	0.0	1.7	2.8	7.5	0.1	0.0				0.4	0.0	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.7	11.5	11.4	0.1	0.0				3.2	0.0	7.4
LnGrp Delay(d),s/veh	0.0	23.9	24.0	45.0	0.2	0.0				42.7	0.0	60.0
LnGrp LOS		C	C	D	A					D		E
Approach Vol, veh/h		1697			1340						545	
Approach Delay, s/veh		23.9			24.4						56.4	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.3	58.6		22.1		87.9		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	29.5	47.0		18.0		81.0		
Max Q Clear Time (g_c+I1), s	24.0	30.8		16.3		2.1		
Green Ext Time (p_c), s	0.9	8.6		0.3		13.1		

Intersection Summary	
HCM 2010 Ctrl Delay	29.1
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	736	524	1027	350	194	2	322
Future Volume (vph)	736	524	1027	350	194	2	322
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	36.0	86.0	50.0	50.0	24.0	24.0	24.0
Total Split (%)	32.7%	78.2%	45.5%	45.5%	21.8%	21.8%	21.8%
Yellow Time (s)	4.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	29.5	82.6	48.7	48.7	16.4	16.4	16.4
Actuated g/C Ratio	0.27	0.75	0.44	0.44	0.15	0.15	0.15
v/c Ratio	0.87	0.21	0.71	0.42	0.76	0.53	0.49
Control Delay	32.4	2.7	29.2	3.7	63.9	14.6	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.4	2.7	29.2	3.7	63.9	14.6	10.4
LOS	C	A	C	A	E	B	B
Approach Delay		20.1	22.7			29.8	
Approach LOS		C	C			C	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 22.8 — Intersection LOS: C
Intersection Capacity Utilization 71.0% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	736	524	0	0	1027	350	194	2	322	0	0	0
Future Volume (veh/h)	736	524	0	0	1027	350	194	2	322	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	818	582	0	0	1141	329	253	0	79			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	888	2913	0	0	1852	818	337	0	150			
Arrive On Green	0.42	1.00	0.00	0.00	0.51	0.51	0.09	0.00	0.09			
Sat Flow, veh/h	3510	3705	0	0	3705	1594	3619	0	1615			
Grp Volume(v), veh/h	818	582	0	0	1141	329	253	0	79			
Grp Sat Flow(s),veh/h/ln	1755	1805	0	0	1805	1594	1810	0	1615			
Q Serve(g_s), s	24.2	0.0	0.0	0.0	24.8	13.9	7.5	0.0	5.1			
Cycle Q Clear(g_c), s	24.2	0.0	0.0	0.0	24.8	13.9	7.5	0.0	5.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	888	2913	0	0	1852	818	337	0	150			
V/C Ratio(X)	0.92	0.20	0.00	0.00	0.62	0.40	0.75	0.00	0.53			
Avail Cap(c_a), veh/h	1005	2913	0	0	1852	818	609	0	272			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.7	0.0	0.0	0.0	19.1	16.4	48.6	0.0	47.6			
Incr Delay (d2), s/veh	9.0	0.1	0.0	0.0	1.5	1.5	3.4	0.0	2.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.7	0.0	0.0	0.0	12.6	6.5	3.9	0.0	2.4			
LnGrp Delay(d),s/veh	39.7	0.1	0.0	0.0	20.6	17.9	52.0	0.0	50.4			
LnGrp LOS	D	A			C	B	D		D			
Approach Vol, veh/h		1400			1470			332				
Approach Delay, s/veh		23.2			20.0			51.6				
Approach LOS		C			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		94.3			32.3	61.9		15.7
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		80.5			31.5	44.5		18.5
Max Q Clear Time (g_c+I1), s		2.0			26.2	26.8		9.5
Green Ext Time (p_c), s		11.0			1.6	8.1		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Notes

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1104	661	17	898	375	226	667
Future Volume (vph)	1104	661	17	898	375	226	667
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	26.0	26.0	10.0	36.0	24.0	24.0	24.0
Total Split (%)	43.3%	43.3%	16.7%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	29.5	29.5	5.0	31.5	19.0	19.0	19.0
Actuated g/C Ratio	0.49	0.49	0.08	0.52	0.32	0.32	0.32
v/c Ratio	0.38	0.70	0.13	0.53	0.64	0.60	1.24
Control Delay	10.7	9.3	36.6	9.0	24.9	23.0	144.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	9.3	36.6	9.0	24.9	23.0	144.4
LOS	B	A	D	A	C	C	F
Approach Delay	10.2			9.5		87.3	
Approach LOS	B			A		F	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 77.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1104	661	17	898	0	0	0	0	375	226	667
Future Volume (veh/h)	0	1104	661	17	898	0	0	0	0	375	226	667
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1162	570	18	945	0				316	348	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2601	633	35	1796	0				513	570	484
Arrive On Green	0.00	0.42	0.42	0.04	1.00	0.00				0.32	0.32	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1162	570	18	945	0				316	348	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	8.0	21.1	0.7	0.0	0.0				9.9	9.8	0.0
Cycle Q Clear(g_c), s	0.0	8.0	21.1	0.7	0.0	0.0				9.9	9.8	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2601	633	35	1796	0				513	570	484
V/C Ratio(X)	0.00	0.45	0.90	0.51	0.53	0.00				0.62	0.61	0.00
Avail Cap(c_a), veh/h	0	2601	633	135	1796	0				513	570	484
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.81	0.81	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.4	16.2	28.4	0.0	0.0				17.4	17.4	0.0
Incr Delay (d2), s/veh	0.0	0.1	15.9	3.5	0.9	0.0				5.5	4.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.4	11.5	0.3	0.2	0.0				5.2	5.6	0.0
LnGrp Delay(d),s/veh	0.0	12.5	32.1	31.9	0.9	0.0				22.9	22.2	0.0
LnGrp LOS		B	C	C	A					C	C	
Approach Vol, veh/h		1732			963						664	
Approach Delay, s/veh		19.0			1.5						22.5	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.3	29.7		24.0		36.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	21.5		19.0		31.5		
Max Q Clear Time (g_c+I1), s	2.7	23.1		11.9		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.4		21.1		

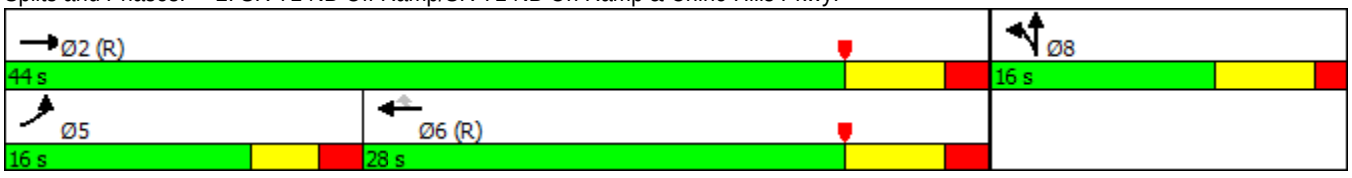
Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	395	1084	577	510	338	102
Future Volume (vph)	395	1084	577	510	338	102
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.8	37.5	21.7	21.7	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.80	0.55	0.50	0.78	0.74	0.56
Control Delay	36.4	9.1	16.8	19.1	44.9	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	9.1	16.8	19.1	44.9	27.5
LOS	D	A	B	B	D	C
Approach Delay		16.4	17.9			34.1
Approach LOS		B	B			C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 77.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	395	1084	0	0	577	510	338	102	5	0	0	0
Future Volume (veh/h)	395	1084	0	0	577	510	338	102	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	425	1166	0	0	620	545	363	110	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	514	2138	0	0	1257	555	540	297	3			
Arrive On Green	0.17	0.63	0.00	0.00	0.37	0.37	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1781	16			
Grp Volume(v), veh/h	425	1166	0	0	620	545	363	0	111			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	8.3	11.6	0.0	0.0	8.4	21.5	6.3	0.0	3.3			
Cycle Q Clear(g_c), s	8.3	11.6	0.0	0.0	8.4	21.5	6.3	0.0	3.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	514	2138	0	0	1257	555	540	0	300			
V/C Ratio(X)	0.83	0.55	0.00	0.00	0.49	0.98	0.67	0.00	0.37			
Avail Cap(c_a), veh/h	542	2138	0	0	1257	555	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.64	0.64	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.9	6.4	0.0	0.0	14.7	18.8	23.5	0.0	22.2			
Incr Delay (d2), s/veh	8.9	0.9	0.0	0.0	0.9	26.6	6.6	0.0	3.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	5.6	0.0	0.0	4.1	12.9	3.3	0.0	1.9			
LnGrp Delay(d),s/veh	32.8	7.3	0.0	0.0	15.5	45.4	30.0	0.0	25.7			
LnGrp LOS	C	A			B	D	C		C			
Approach Vol, veh/h		1591			1165			474				
Approach Delay, s/veh		14.1			29.5			29.0				
Approach LOS		B			C			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			15.4	28.6		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		13.6			10.3	23.5		8.3
Green Ext Time (p_c), s		16.0			0.1	0.0		0.4

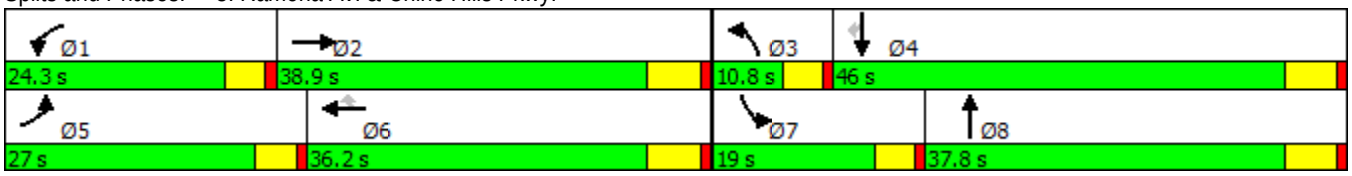
Intersection Summary	
HCM 2010 Ctrl Delay	21.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	246	841	137	666	124	21	284	150	445	400
Future Volume (vph)	246	841	137	666	124	21	284	150	445	400
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	20.9	35.0	14.5	28.6	28.6	5.7	32.1	13.5	44.0	44.0
Actuated g/C Ratio	0.18	0.30	0.12	0.25	0.25	0.05	0.28	0.12	0.38	0.38
v/c Ratio	0.90	0.60	0.73	0.84	0.27	0.28	0.47	0.85	0.36	0.51
Control Delay	80.1	37.3	69.5	52.2	5.4	63.9	32.4	87.8	28.7	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	37.3	69.5	52.2	5.4	63.9	32.4	87.8	28.7	5.1
LOS	F	D	E	D	A	E	C	F	C	A
Approach Delay		46.9		48.5			33.9		28.1	
Approach LOS		D		D			C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.1	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 40.3	Intersection LOS: D
Intersection Capacity Utilization 88.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	841	2	137	666	124	21	284	134	150	445	400
Future Volume (veh/h)	246	841	2	137	666	124	21	284	134	150	445	400
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	262	895	2	146	709	87	22	302	88	160	473	316
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	287	1576	4	172	821	362	36	742	212	185	1286	567
Arrive On Green	0.18	0.31	0.31	0.11	0.24	0.24	0.02	0.28	0.28	0.11	0.38	0.38
Sat Flow, veh/h	1619	5062	11	1619	3420	1509	1619	2616	748	1619	3420	1507
Grp Volume(v), veh/h	262	579	318	146	709	87	22	195	195	160	473	316
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1654	1619	1710	1507
Q Serve(g_s), s	17.9	16.7	16.7	10.0	22.4	5.2	1.5	10.4	10.8	11.0	11.3	18.7
Cycle Q Clear(g_c), s	17.9	16.7	16.7	10.0	22.4	5.2	1.5	10.4	10.8	11.0	11.3	18.7
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	287	1020	560	172	821	362	36	485	469	185	1286	567
V/C Ratio(X)	0.91	0.57	0.57	0.85	0.86	0.24	0.62	0.40	0.41	0.86	0.37	0.56
Avail Cap(c_a), veh/h	322	1020	560	283	922	407	89	485	469	207	1286	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	32.5	32.5	49.5	41.1	34.6	54.7	32.7	32.8	49.1	25.5	27.8
Incr Delay (d2), s/veh	25.9	0.9	1.7	6.0	8.3	0.5	6.2	2.5	2.7	25.5	0.8	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	7.7	8.6	4.7	11.5	2.2	0.7	5.3	5.3	6.2	5.5	8.4
LnGrp Delay(d),s/veh	71.5	33.4	34.2	55.5	49.4	35.0	60.9	35.1	35.5	74.6	26.3	31.7
LnGrp LOS	E	C	C	E	D	D	E	D	D	E	C	C
Approach Vol, veh/h		1159			942			412			949	
Approach Delay, s/veh		42.2			49.0			36.7			36.2	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.6	40.9	7.1	48.2	24.6	32.9	17.5	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	12.0	18.7	3.5	20.7	19.9	24.4	13.0	12.8
Green Ext Time (p_c), s	0.1	10.4	0.0	6.1	0.1	2.6	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	41.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	828	120	45	762	87	27
Future Vol, veh/h	828	120	45	762	87	27
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	920	133	50	847	97	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	923	0	1446	463
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	523	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	748	-	125	551
Stage 1	-	-	-	-	352	-
Stage 2	-	-	-	-	565	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	748	-	116	549
Mov Cap-2 Maneuver	-	-	-	-	295	-
Stage 1	-	-	-	-	351	-
Stage 2	-	-	-	-	527	-

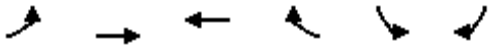
Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	22.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	331	-	-	748	-
HCM Lane V/C Ratio	0.383	-	-	0.067	-
HCM Control Delay (s)	22.5	-	-	10.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.7	-	-	0.2	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	119	736	574	58	232
Future Volume (vph)	119	736	574	58	232
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	10.5	37.9	22.8	23.5	35.2
Actuated g/C Ratio	0.14	0.52	0.31	0.32	0.48
v/c Ratio	0.56	0.45	0.65	0.07	0.31
Control Delay	40.0	11.6	24.7	20.6	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	11.6	24.7	20.6	5.0
LOS	D	B	C	C	A
Approach Delay		15.5	24.7	8.1	
Approach LOS		B	C	A	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 73.2		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.65		
Intersection Signal Delay: 17.6	Intersection LOS: B	
Intersection Capacity Utilization 56.4%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	736	574	60	58	232
Future Volume (veh/h)	119	736	574	60	58	232
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	129	800	624	63	63	66
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	160	1898	1244	125	877	605
Arrive On Green	0.10	0.56	0.40	0.40	0.30	0.30
Sat Flow, veh/h	1619	3510	3220	316	2956	1530
Grp Volume(v), veh/h	129	800	340	347	63	66
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1736	1478	1530
Q Serve(g_s), s	6.1	10.6	11.7	11.8	1.2	2.1
Cycle Q Clear(g_c), s	6.1	10.6	11.7	11.8	1.2	2.1
Prop In Lane	1.00			0.18	1.00	1.00
Lane Grp Cap(c), veh/h	160	1898	679	690	877	605
V/C Ratio(X)	0.81	0.42	0.50	0.50	0.07	0.11
Avail Cap(c_a), veh/h	588	3726	1141	1159	877	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	10.1	17.7	17.7	19.8	14.9
Incr Delay (d2), s/veh	3.6	0.2	0.8	0.8	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	5.1	5.6	5.7	0.5	2.4
LnGrp Delay(d),s/veh	38.1	10.3	18.6	18.6	19.9	15.3
LnGrp LOS	D	B	B	B	B	B
Approach Vol, veh/h		929	687		129	
Approach Delay, s/veh		14.2	18.6		17.6	
Approach LOS		B	B		B	

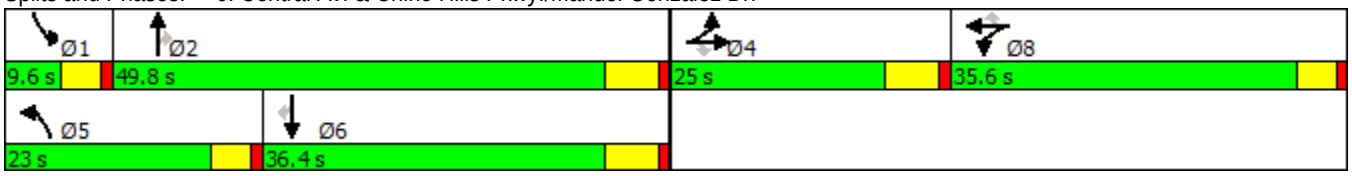
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		49.2		29.0	12.3	36.9		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		12.6		4.1	8.1	13.8		
Green Ext Time (p_c), s		21.0		0.3	0.1	17.3		

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	2	356	11	40	32	231	702	1	10	803	222
Future Volume (vph)	475	2	356	11	40	32	231	702	1	10	803	222
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.87	0.82	0.64	0.05	0.18	0.10	0.84	0.42	0.00	0.14	0.83	0.42
Control Delay	69.7	62.8	9.6	37.5	40.1	0.6	65.7	18.3	0.0	54.2	41.6	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	62.8	9.6	37.5	40.1	0.6	65.7	18.3	0.0	54.2	41.6	14.7
LOS	E	E	A	D	D	A	E	B	A	D	D	B
Approach Delay		42.0			24.4			30.0			36.0	
Approach LOS		D			C			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 72.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	475	2	356	11	40	32	231	702	1	10	803	222
Future Volume (veh/h)	475	2	356	11	40	32	231	702	1	10	803	222
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	517	0	259	12	43	18	251	763	1	11	873	171
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	619	0	293	155	173	146	281	1646	735	21	1098	485
Arrive On Green	0.19	0.00	0.19	0.10	0.10	0.10	0.17	0.48	0.48	0.01	0.32	0.32
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1510
Grp Volume(v), veh/h	517	0	259	12	43	18	251	763	1	11	873	171
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1510
Q Serve(g_s), s	14.6	0.0	15.7	0.6	2.1	1.0	14.5	14.2	0.0	0.6	22.2	8.3
Cycle Q Clear(g_c), s	14.6	0.0	15.7	0.6	2.1	1.0	14.5	14.2	0.0	0.6	22.2	8.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	619	0	293	155	173	146	281	1646	735	21	1098	485
V/C Ratio(X)	0.83	0.00	0.89	0.08	0.25	0.12	0.89	0.46	0.00	0.51	0.79	0.35
Avail Cap(c_a), veh/h	653	0	308	527	586	495	313	1646	735	85	1098	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	0.0	37.5	39.2	39.9	39.4	38.5	16.5	12.8	46.7	29.5	24.8
Incr Delay (d2), s/veh	8.9	0.0	24.2	0.2	0.7	0.4	23.3	0.9	0.0	6.9	6.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.0	8.6	0.3	1.1	0.5	8.3	6.9	0.0	0.3	11.3	3.7
LnGrp Delay(d),s/veh	45.9	0.0	61.7	39.4	40.6	39.8	61.8	17.4	12.8	53.6	35.4	26.8
LnGrp LOS	D		E	D	D	D	E	B	B	D	D	C
Approach Vol, veh/h		776			73			1015			1055	
Approach Delay, s/veh		51.2			40.2			28.4			34.2	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	51.6		24.0	21.1	36.4		13.7
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.6	16.2		17.7	16.5	24.2		4.1
Green Ext Time (p_c), s	0.0	18.0		0.5	0.1	5.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	36.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	5	521	4	351	9	550	669	497	682
Future Volume (vph)	25	5	521	4	351	9	550	669	497	682
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.1	10.1	23.2	23.2	67.0	5.1	24.0	24.0	38.0	64.9
Actuated g/C Ratio	0.09	0.09	0.21	0.21	0.61	0.05	0.22	0.22	0.35	0.59
v/c Ratio	0.17	0.16	0.84	0.80	0.36	0.12	0.77	0.85	0.93	0.25
Control Delay	53.4	26.4	64.7	59.9	5.1	59.0	49.7	17.1	61.1	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	26.4	64.7	59.9	5.1	59.0	49.7	17.1	61.1	13.1
LOS	D	C	E	E	A	E	D	B	E	B
Approach Delay		39.9		39.4			32.0			33.1
Approach LOS		D		D			C			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 109.6
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 34.4 — Intersection LOS: C
Intersection Capacity Utilization 95.4% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	5	20	521	4	351	9	550	669	497	682	17
Future Volume (veh/h)	25	5	20	521	4	351	9	550	669	497	682	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	5	12	546	0	215	9	573	521	518	710	14
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	107	31	75	640	0	812	18	734	324	539	2661	52
Arrive On Green	0.07	0.07	0.07	0.20	0.00	0.20	0.01	0.21	0.21	0.33	0.54	0.54
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4959	98
Grp Volume(v), veh/h	26	0	17	546	0	215	9	573	521	518	469	255
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.7	0.0	1.1	18.0	0.0	8.5	0.6	17.4	23.7	34.6	8.5	8.6
Cycle Q Clear(g_c), s	1.7	0.0	1.1	18.0	0.0	8.5	0.6	17.4	23.7	34.6	8.5	8.6
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	107	0	106	640	0	812	18	734	324	539	1758	956
V/C Ratio(X)	0.24	0.00	0.16	0.85	0.00	0.26	0.51	0.78	1.61	0.96	0.27	0.27
Avail Cap(c_a), veh/h	147	0	145	821	0	897	73	734	324	550	1758	956
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	0.0	48.6	42.7	0.0	14.2	54.3	40.9	43.3	36.1	13.8	13.8
Incr Delay (d2), s/veh	0.4	0.0	0.3	7.0	0.0	0.2	8.2	8.1	288.1	28.2	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	8.7	0.0	3.6	0.3	9.0	35.7	19.6	3.9	4.4
LnGrp Delay(d),s/veh	49.3	0.0	48.9	49.8	0.0	14.3	62.5	48.9	331.4	64.3	14.2	14.5
LnGrp LOS	D		D	D		B	E	D	F	E	B	B
Approach Vol, veh/h		43			761			1103			1242	
Approach Delay, s/veh		49.2			39.8			182.5			35.2	
Approach LOS		D			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	41.3	29.5		11.9	5.8	65.0		27.6
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	36.6	25.7		3.7	2.6	10.6		20.0
Green Ext Time (p_c), s	0.1	0.0		0.0	0.0	21.7		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	88.1
HCM 2010 LOS	F

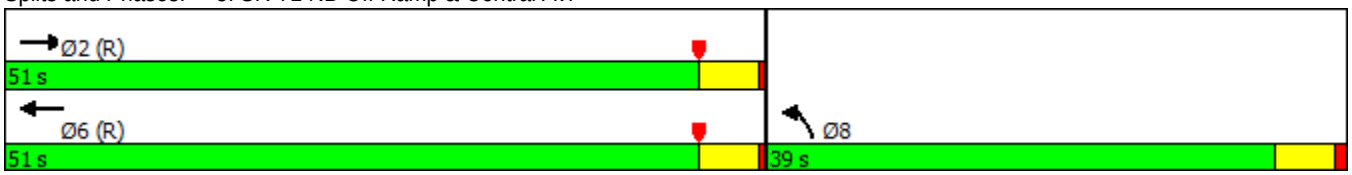
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1117	836	152
Future Volume (vph)	1117	836	152
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	51.0	51.0	39.0
Total Split (%)	56.7%	56.7%	43.3%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	61.6	61.6	18.9
Actuated g/C Ratio	0.68	0.68	0.21
v/c Ratio	0.35	0.26	0.99dr
Control Delay	10.7	6.2	38.1
Queue Delay	0.0	0.0	0.0
Total Delay	10.7	6.2	38.1
LOS	B	A	D
Approach Delay	10.7	6.2	38.1
Approach LOS	B	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 47.2%	ICU Level of Service A
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1117	0	0	836	152	328
Future Volume (veh/h)	1117	0	0	836	152	328
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	0	0	1800	1700	1800
Adj Flow Rate, veh/h	1176	0	0	880	160	184
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3685	0	0	3685	234	221
Arrive On Green	1.00	0.00	0.00	0.75	0.14	0.14
Sat Flow, veh/h	5238	0	0	5238	1619	1530
Grp Volume(v), veh/h	1176	0	0	880	160	184
Grp Sat Flow(s),veh/h/ln	1638	0	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	4.9	8.4	10.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.9	8.4	10.5
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	3685	0	0	3685	234	221
V/C Ratio(X)	0.32	0.00	0.00	0.24	0.68	0.83
Avail Cap(c_a), veh/h	3685	0	0	3685	612	578
HCM Platoon Ratio	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.4	36.5	37.4
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.2	1.3	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	2.3	3.9	4.6
LnGrp Delay(d),s/veh	0.2	0.0	0.0	3.6	37.9	40.6
LnGrp LOS	A			A	D	D
Approach Vol, veh/h	1176			880	344	
Approach Delay, s/veh	0.2			3.6	39.3	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		72.0				72.0		18.0
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		46.5				46.5		34.0
Max Q Clear Time (g_c+I1), s		2.0				6.9		12.5
Green Ext Time (p_c), s		12.5				12.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

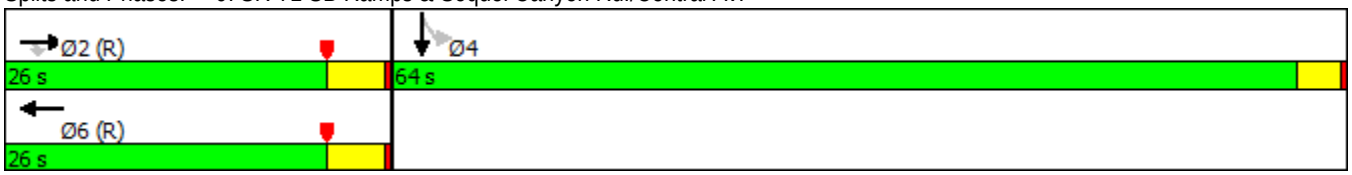
Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	678	85	652	807	0
Future Volume (vph)	678	85	652	807	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	26.0	26.0	26.0	64.0	64.0
Total Split (%)	28.9%	28.9%	28.9%	71.1%	71.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	23.6	23.6	23.6	58.4	58.4
Actuated g/C Ratio	0.26	0.26	0.26	0.65	0.65
v/c Ratio	0.53	0.19	0.51	0.74	0.87
Control Delay	31.0	7.6	29.0	15.7	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	7.6	29.0	15.7	23.9
LOS	C	A	C	B	C
Approach Delay	28.4		29.0		20.0
Approach LOS	C		C		C

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 6 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 24.2 — Intersection LOS: C
Intersection Capacity Utilization 68.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	678	85	0	652	0	0	0	0	807	0	751
Future Volume (veh/h)	0	678	85	0	652	0	0	0	0	807	0	751
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	685	0	0	659	0				724	128	633
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1910	595	0	1910	0				846	138	682
Arrive On Green	0.00	0.39	0.00	0.00	0.13	0.00				0.52	0.52	0.52
Sat Flow, veh/h	0	5076	1530	0	5238	0				1619	264	1306
Grp Volume(v), veh/h	0	685	0	0	659	0				724	0	761
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	0				1619	0	1570
Q Serve(g_s), s	0.0	8.9	0.0	0.0	11.0	0.0				34.8	0.0	40.5
Cycle Q Clear(g_c), s	0.0	8.9	0.0	0.0	11.0	0.0				34.8	0.0	40.5
Prop In Lane	0.00		1.00	0.00		0.00				1.00		0.83
Lane Grp Cap(c), veh/h	0	1910	595	0	1910	0				846	0	820
V/C Ratio(X)	0.00	0.36	0.00	0.00	0.35	0.00				0.86	0.00	0.93
Avail Cap(c_a), veh/h	0	1910	595	0	1910	0				1088	0	1055
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.5	0.0	0.0	28.8	0.0				18.6	0.0	19.9
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.5	0.0				4.5	0.0	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.1	0.0	0.0	5.1	0.0				16.4	0.0	19.7
LnGrp Delay(d),s/veh	0.0	20.1	0.0	0.0	29.3	0.0				23.1	0.0	30.4
LnGrp LOS		C			C					C		C
Approach Vol, veh/h		685			659						1485	
Approach Delay, s/veh		20.1			29.3						26.8	
Approach LOS		C			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		39.5		50.5		39.5		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		21.5		60.5		21.5		
Max Q Clear Time (g_c+I1), s		10.9		42.5		13.0		
Green Ext Time (p_c), s		5.1		4.6		4.4		

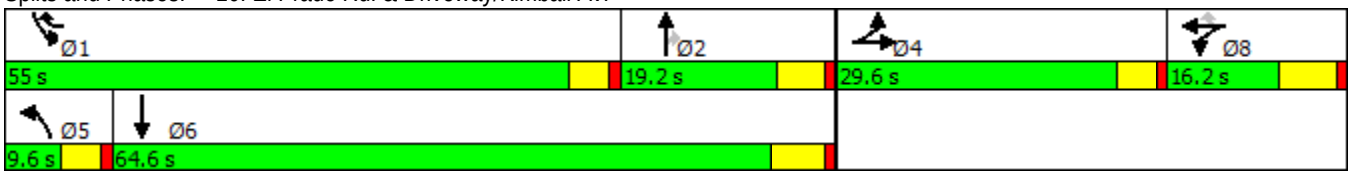
Intersection Summary	
HCM 2010 Ctrl Delay	25.8
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	34	8	3	535	4	192	23	776	336
Future Volume (vph)	34	8	3	535	4	192	23	776	336
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.17	0.07	0.14	0.48	0.05	0.74	0.07	0.92	0.17
Control Delay	42.6	29.8	48.4	2.5	53.2	60.2	0.3	42.8	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	29.8	48.4	2.5	53.2	60.2	0.3	42.8	10.7
LOS	D	C	D	A	D	E	A	D	B
Approach Delay		38.7	4.5			53.8			32.8
Approach LOS		D	A			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 80.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	8	8	22	3	535	4	192	23	776	336	13
Future Volume (veh/h)	34	8	8	22	3	535	4	192	23	776	336	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	36	8	6	23	3	112	4	202	23	817	354	13
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	71	53	146	19	899	79	236	201	797	1933	71
Arrive On Green	0.07	0.07	0.07	0.10	0.10	0.10	0.05	0.13	0.13	0.49	0.57	0.57
Sat Flow, veh/h	1619	956	717	1525	199	1530	1619	1800	1530	1619	3365	123
Grp Volume(v), veh/h	36	0	14	26	0	112	4	202	23	817	179	188
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1724	0	1530	1619	1800	1530	1619	1710	1778
Q Serve(g_s), s	2.2	0.0	0.8	1.4	0.0	3.3	0.2	11.2	1.4	50.4	5.1	5.1
Cycle Q Clear(g_c), s	2.2	0.0	0.8	1.4	0.0	3.3	0.2	11.2	1.4	50.4	5.1	5.1
Prop In Lane	1.00		0.43	0.88		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	124	165	0	899	79	236	201	797	982	1021
V/C Ratio(X)	0.30	0.00	0.11	0.16	0.00	0.12	0.05	0.86	0.11	1.03	0.18	0.18
Avail Cap(c_a), veh/h	395	0	408	168	0	902	79	246	209	797	982	1021
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	44.3	42.5	0.0	9.4	46.5	43.5	39.2	26.0	10.4	10.4
Incr Delay (d2), s/veh	1.4	0.0	0.4	0.4	0.0	0.1	0.1	23.7	0.3	38.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.4	0.7	0.0	1.4	0.1	7.2	0.6	30.9	2.4	2.5
LnGrp Delay(d),s/veh	46.3	0.0	44.7	43.0	0.0	9.5	46.6	67.3	39.5	64.6	10.5	10.5
LnGrp LOS	D		D	D		A	D	E	D	F	B	B
Approach Vol, veh/h		50			138			229			1184	
Approach Delay, s/veh		45.8			15.8			64.1			47.8	
Approach LOS		D			B			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.2		12.2	9.6	64.6		16.0
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	13.2		4.2	2.2	7.1		5.3
Green Ext Time (p_c), s	0.0	0.2		0.1	0.0	3.3		0.1

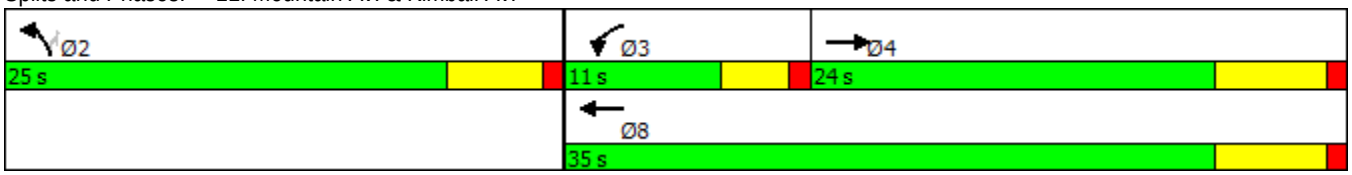
Intersection Summary	
HCM 2010 Ctrl Delay	47.3
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	830	14	464	94	62
Future Volume (vph)	830	14	464	94	62
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	16.6	7.4	18.1	8.9	8.9
Actuated g/C Ratio	0.43	0.19	0.47	0.23	0.23
v/c Ratio	0.68	0.05	0.32	0.28	0.17
Control Delay	14.8	18.1	7.3	15.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	18.1	7.3	15.5	5.7
LOS	B	B	A	B	A
Approach Delay	14.8		7.6	11.6	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 38.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 41.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	830	67	14	464	94	62
Future Volume (veh/h)	830	67	14	464	94	62
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	912	72	15	510	103	45
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1198	95	44	1736	305	288
Arrive On Green	0.37	0.37	0.03	0.51	0.19	0.19
Sat Flow, veh/h	3302	254	1619	3510	1619	1530
Grp Volume(v), veh/h	486	498	15	510	103	45
Grp Sat Flow(s),veh/h/ln	1710	1755	1619	1710	1619	1530
Q Serve(g_s), s	9.2	9.2	0.3	3.2	2.0	0.9
Cycle Q Clear(g_c), s	9.2	9.2	0.3	3.2	2.0	0.9
Prop In Lane		0.14	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	638	655	44	1736	305	288
V/C Ratio(X)	0.76	0.76	0.34	0.29	0.34	0.16
Avail Cap(c_a), veh/h	828	850	305	2668	858	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	10.2	17.8	5.3	13.1	12.6
Incr Delay (d2), s/veh	2.1	2.1	1.7	0.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	4.8	0.2	1.5	0.9	0.4
LnGrp Delay(d),s/veh	12.3	12.3	19.5	5.3	13.3	12.7
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	984			525	148	
Approach Delay, s/veh	12.3			5.7	13.1	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	5.0	19.9				24.9
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		4.0	2.3	11.2				5.2
Green Ext Time (p_c), s		0.1	0.0	2.6				4.1

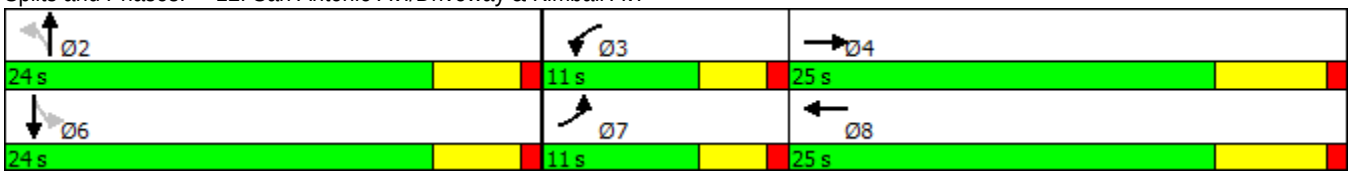
Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	895	14	428	49	0		
Future Volume (vph)	895	14	428	49	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	25.0	11.0	25.0	24.0	24.0	24.0	11.0
Total Split (%)	41.7%	18.3%	41.7%	40.0%	40.0%	40%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	14.7	7.5	16.0	8.9	8.9		
Actuated g/C Ratio	0.40	0.20	0.44	0.24	0.24		
v/c Ratio	0.70	0.05	0.30	0.17	0.03		
Control Delay	14.9	17.6	7.2	14.1	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	14.9	17.6	7.2	14.1	0.1		
LOS	B	B	A	B	A		
Approach Delay	14.9		7.5		10.5		
Approach LOS	B		A		B		

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 36.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 12.4 — Intersection LOS: B
Intersection Capacity Utilization 41.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	895	19	14	428	0	49	0	17	0	0	0
Future Volume (veh/h)	0	895	19	14	428	0	49	0	17	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	942	20	15	451	0	52	0	16	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	4	1267	27	44	1734	0	510	0	295	198	347	0
Arrive On Green	0.00	0.37	0.37	0.03	0.51	0.00	0.19	0.00	0.19	0.00	0.00	0.00
Sat Flow, veh/h	1619	3424	73	1619	3510	0	1619	0	1530	1340	1800	0
Grp Volume(v), veh/h	0	470	492	15	451	0	52	0	16	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1787	1619	1710	0	1619	0	1530	1340	1800	0
Q Serve(g_s), s	0.0	8.7	8.7	0.3	2.7	0.0	1.0	0.0	0.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.7	8.7	0.3	2.7	0.0	1.0	0.0	0.3	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	633	661	44	1734	0	510	0	295	198	347	0
V/C Ratio(X)	0.00	0.74	0.74	0.34	0.26	0.00	0.10	0.00	0.05	0.00	0.00	0.00
Avail Cap(c_a), veh/h	312	895	935	312	1789	0	1050	0	805	645	947	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.9	9.9	17.3	5.1	0.0	12.2	0.0	12.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.0	1.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.2	4.4	0.2	1.3	0.0	0.4	0.0	0.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	11.0	10.9	19.1	5.1	0.0	12.3	0.0	12.0	0.0	0.0	0.0
LnGrp LOS		B	B	B	A		B		B			
Approach Vol, veh/h		962			466			68			0	
Approach Delay, s/veh		11.0			5.6			12.2			0.0	
Approach LOS		B			A			B				

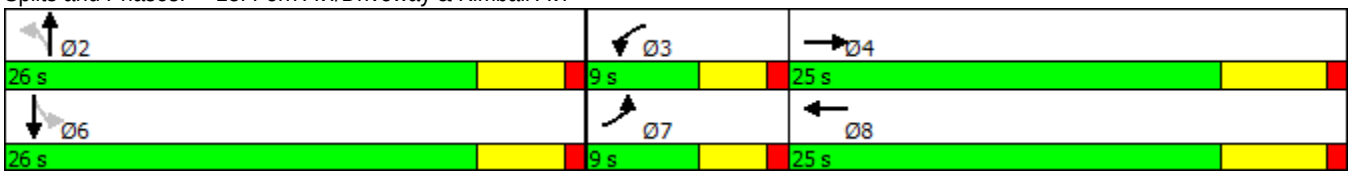
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.0	19.4		11.9	0.0	24.4
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		3.0	2.3	10.7		0.0	0.0	4.7
Green Ext Time (p_c), s		0.0	0.0	2.8		0.0	0.0	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	900	11	370	45	1	100	7
Future Volume (vph)	4	900	11	370	45	1	100	7
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.3	17.2	5.3	17.2	8.7	8.7	8.7	8.7
Actuated g/C Ratio	0.14	0.45	0.14	0.45	0.23	0.23	0.23	0.23
v/c Ratio	0.02	0.68	0.06	0.27	0.18	0.11	0.41	0.09
Control Delay	20.5	14.4	20.5	9.0	14.3	6.1	18.0	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	14.4	20.5	9.0	14.3	6.1	18.0	7.6
LOS	C	B	C	A	B	A	B	A
Approach Delay		14.4		9.3		10.5		15.6
Approach LOS		B		A		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 38.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 48.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	900	21	11	370	0	45	1	37	100	7	24
Future Volume (veh/h)	4	900	21	11	370	0	45	1	37	100	7	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	1023	18	12	420	0	51	1	22	114	8	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	11	1371	24	26	1395	0	410	11	232	404	122	138
Arrive On Green	0.01	0.40	0.40	0.02	0.41	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1619	3437	60	1619	3510	0	1339	67	1473	1332	775	872
Grp Volume(v), veh/h	5	509	532	12	420	0	51	0	23	114	0	17
Grp Sat Flow(s),veh/h/ln	1619	1710	1788	1619	1710	0	1339	0	1540	1332	0	1646
Q Serve(g_s), s	0.1	8.7	8.7	0.3	2.8	0.0	1.2	0.0	0.4	2.7	0.0	0.3
Cycle Q Clear(g_c), s	0.1	8.7	8.7	0.3	2.8	0.0	1.5	0.0	0.4	3.2	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.00	1.00		0.96	1.00		0.53
Lane Grp Cap(c), veh/h	11	682	713	26	1395	0	410	0	243	404	0	260
V/C Ratio(X)	0.46	0.75	0.75	0.47	0.30	0.00	0.12	0.00	0.09	0.28	0.00	0.07
Avail Cap(c_a), veh/h	237	967	1011	237	1933	0	1027	0	952	1017	0	1017
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	8.8	8.8	16.7	6.8	0.0	12.9	0.0	12.3	13.6	0.0	12.2
Incr Delay (d2), s/veh	10.5	1.0	0.9	4.9	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.1	4.3	0.1	1.4	0.0	0.4	0.0	0.2	1.0	0.0	0.1
LnGrp Delay(d),s/veh	27.4	9.8	9.7	21.6	6.9	0.0	12.9	0.0	12.4	13.8	0.0	12.3
LnGrp LOS	C	A	A	C	A		B		B	B		B
Approach Vol, veh/h		1046			432			74			131	
Approach Delay, s/veh		9.8			7.3			12.7			13.6	
Approach LOS		A			A			B			B	

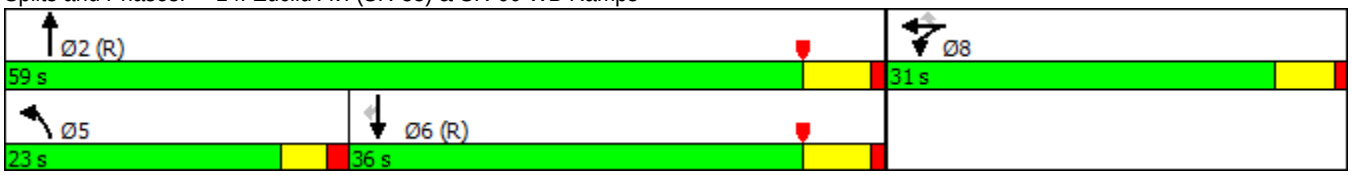
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.3	4.5	19.3		10.3	4.2	19.6
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		3.5	2.3	10.7		5.2	2.1	4.8
Green Ext Time (p_c), s		0.2	0.0	2.9		0.2	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	9.6
HCM 2010 LOS	A

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	526	6	398	226	976	856	518
Future Volume (vph)	526	6	398	226	976	856	518
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.1	23.1	23.1	16.2	56.4	35.7	35.7
Actuated g/C Ratio	0.26	0.26	0.26	0.18	0.63	0.40	0.40
v/c Ratio	0.86	0.82	0.70	0.82	0.48	0.66	0.60
Control Delay	53.2	45.3	27.9	46.3	19.4	26.7	5.2
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	53.2	45.3	27.9	46.3	20.6	26.7	5.2
LOS	D	D	C	D	C	C	A
Approach Delay		42.5			25.5	18.6	
Approach LOS		D			C	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 27.3	Intersection LOS: C
Intersection Capacity Utilization 88.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	526	6	398	226	976	0	0	856	518
Future Volume (veh/h)	0	0	0	526	6	398	226	976	0	0	856	518
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				639	0	178	238	1027	0	0	901	545
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				728	0	340	265	2252	0	0	1522	660
Arrive On Green				0.22	0.00	0.22	0.33	1.00	0.00	0.00	0.45	0.45
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1484
Grp Volume(v), veh/h				639	0	178	238	1027	0	0	901	545
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1484
Q Serve(g_s), s				17.2	0.0	9.3	12.6	0.0	0.0	0.0	17.9	29.0
Cycle Q Clear(g_c), s				17.2	0.0	9.3	12.6	0.0	0.0	0.0	17.9	29.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				728	0	340	265	2252	0	0	1522	660
V/C Ratio(X)				0.88	0.00	0.52	0.90	0.46	0.00	0.00	0.59	0.83
Avail Cap(c_a), veh/h				935	0	436	333	2252	0	0	1522	660
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.61	0.61	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.7	0.0	30.7	29.6	0.0	0.0	0.0	18.8	21.9
Incr Delay (d2), s/veh				6.6	0.0	0.5	13.7	0.4	0.0	0.0	1.7	11.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.3	0.0	3.9	6.6	0.1	0.0	0.0	8.7	13.9
LnGrp Delay(d),s/veh				40.3	0.0	31.1	43.3	0.4	0.0	0.0	20.5	33.2
LnGrp LOS				D		C	D	A			C	C
Approach Vol, veh/h					817			1265			1446	
Approach Delay, s/veh					38.3			8.5			25.3	
Approach LOS					D			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		64.8			19.2	45.6		25.2
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			14.6	31.0		19.2
Green Ext Time (p_c), s		37.4			0.1	0.0		1.1

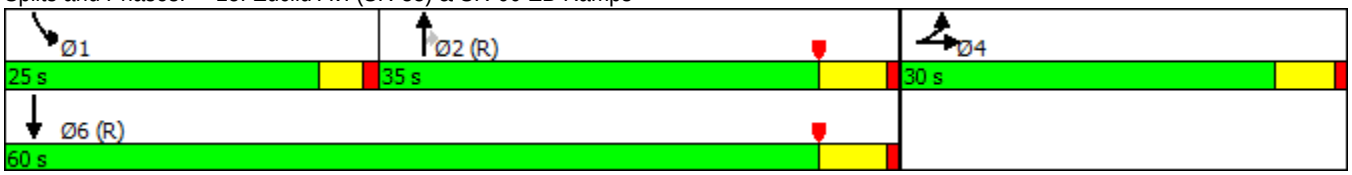
Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	370	2	832	556	295	1086
Future Volume (vph)	370	2	832	556	295	1086
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.6	22.6	33.7	33.7	19.2	56.9
Actuated g/C Ratio	0.25	0.25	0.37	0.37	0.21	0.63
v/c Ratio	0.88	0.84	0.66	0.63	0.88	0.51
Control Delay	57.2	41.5	27.8	5.6	51.9	4.1
Queue Delay	2.4	1.4	0.0	0.0	0.0	0.4
Total Delay	59.6	42.9	27.8	5.6	51.9	4.5
LOS	E	D	C	A	D	A
Approach Delay		50.9	18.9			14.6
Approach LOS		D	B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 88.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	2	322	0	0	0	0	832	556	295	1086	0
Future Volume (veh/h)	370	2	322	0	0	0	0	832	556	295	1086	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	316	88	252				0	849	567	301	1108	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	386	98	281				0	1357	590	330	2206	0
Arrive On Green	0.24	0.24	0.24				0.00	0.40	0.40	0.27	0.86	0.00
Sat Flow, veh/h	1619	412	1180				0	3510	1486	1619	3510	0
Grp Volume(v), veh/h	316	0	340				0	849	567	301	1108	0
Grp Sat Flow(s),veh/h/ln	1619	0	1592				0	1710	1486	1619	1710	0
Q Serve(g_s), s	16.6	0.0	18.6				0.0	17.9	33.5	16.2	7.3	0.0
Cycle Q Clear(g_c), s	16.6	0.0	18.6				0.0	17.9	33.5	16.2	7.3	0.0
Prop In Lane	1.00		0.74				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	386	0	379				0	1357	590	330	2206	0
V/C Ratio(X)	0.82	0.00	0.90				0.00	0.63	0.96	0.91	0.50	0.00
Avail Cap(c_a), veh/h	450	0	442				0	1357	590	378	2206	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.86	0.86	0.63	0.63	0.00
Uniform Delay (d), s/veh	32.4	0.0	33.2				0.0	21.8	26.5	32.0	2.8	0.0
Incr Delay (d2), s/veh	8.6	0.0	17.2				0.0	1.9	26.2	15.9	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	9.9				0.0	8.7	18.0	8.6	3.4	0.0
LnGrp Delay(d),s/veh	41.1	0.0	50.4				0.0	23.7	52.7	47.9	3.3	0.0
LnGrp LOS	D		D					C	D	D	A	
Approach Vol, veh/h		656						1416			1409	
Approach Delay, s/veh		45.9						35.3			12.8	
Approach LOS		D						D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.3	41.2		26.5		63.5		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	18.2	35.5		20.6		9.3		
Green Ext Time (p_c), s	0.1	0.0		0.8		34.7		

Intersection Summary	
HCM 2010 Ctrl Delay	28.2
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	119	308	89	268	120	1073	56	312	956	132
Future Volume (vph)	119	308	89	268	120	1073	56	312	956	132
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	45.0	45.0	45.0	45.0	24.0	48.0	48.0	27.0	51.0	51.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	20.0%	40.0%	40.0%	22.5%	42.5%	42.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.0	26.0	27.0	27.0	14.4	60.4	60.4	17.5	63.9	63.9
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.12	0.50	0.50	0.15	0.53	0.53
v/c Ratio	0.90	0.60	0.71	0.52	0.65	0.45	0.07	0.76	0.38	0.16
Control Delay	97.3	39.4	68.5	35.4	76.3	10.1	0.5	60.6	19.1	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.3	39.4	68.5	35.4	76.3	10.1	0.5	60.6	19.1	4.1
LOS	F	D	E	D	E	B	A	E	B	A
Approach Delay		51.8		41.6		16.0			26.9	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 28.9	Intersection LOS: C
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	308	126	89	268	117	120	1073	56	312	956	132
Future Volume (veh/h)	119	308	126	89	268	117	120	1073	56	312	956	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	124	321	100	93	279	101	125	1118	35	325	996	79
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	226	691	211	210	665	235	149	2306	708	377	2464	765
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.12	0.62	0.62	0.13	0.50	0.50
Sat Flow, veh/h	958	2570	786	926	2471	873	1619	4914	1509	2956	4914	1526
Grp Volume(v), veh/h	124	212	209	93	191	189	125	1118	35	325	996	79
Grp Sat Flow(s),veh/h/ln	958	1710	1646	926	1710	1634	1619	1638	1509	1478	1638	1526
Q Serve(g_s), s	14.7	12.4	12.8	11.2	11.0	11.5	9.1	14.7	1.1	12.9	15.2	3.3
Cycle Q Clear(g_c), s	26.2	12.4	12.8	24.0	11.0	11.5	9.1	14.7	1.1	12.9	15.2	3.3
Prop In Lane	1.00		0.48	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	460	443	210	460	440	149	2306	708	377	2464	765
V/C Ratio(X)	0.55	0.46	0.47	0.44	0.42	0.43	0.84	0.48	0.05	0.86	0.40	0.10
Avail Cap(c_a), veh/h	277	551	531	268	566	541	258	2306	708	554	2464	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.58	0.58	0.85	0.85	0.85
Uniform Delay (d), s/veh	47.1	36.6	36.7	46.8	36.1	36.3	51.8	14.7	12.2	51.3	18.7	15.7
Incr Delay (d2), s/veh	2.1	0.7	0.8	1.5	0.6	0.7	7.2	0.4	0.1	5.5	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	6.0	5.9	3.0	5.3	5.3	4.3	6.6	0.5	5.6	6.9	1.4
LnGrp Delay(d),s/veh	49.2	37.3	37.5	48.2	36.7	36.9	59.0	15.2	12.3	56.8	19.1	16.0
LnGrp LOS	D	D	D	D	D	D	E	B	B	E	B	B
Approach Vol, veh/h		545			473			1278			1400	
Approach Delay, s/veh		40.1			39.1			19.4			27.7	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.8	61.6		38.6	15.9	65.5		38.6
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	22.5	42.7		38.7	19.1	* 47		* 40
Max Q Clear Time (g_c+I1), s	14.9	16.7		28.2	11.1	17.2		26.0
Green Ext Time (p_c), s	0.4	14.5		4.1	0.2	15.5		4.7

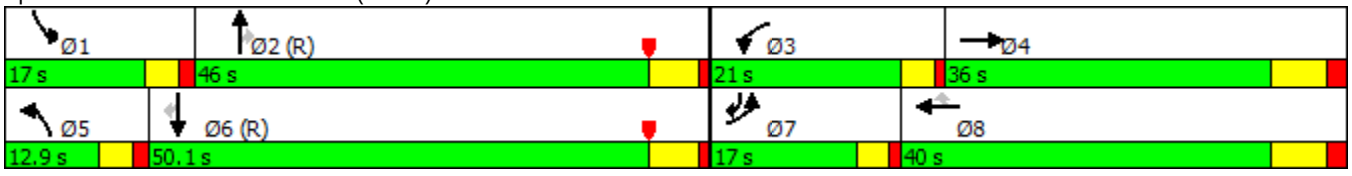
Intersection Summary			
HCM 2010 Ctrl Delay		28.1	
HCM 2010 LOS		C	

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	144	369	165	331	53	69	946	259	125	795	159
Future Volume (vph)	144	369	165	331	53	69	946	259	125	795	159
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.3	22.8	15.6	25.1	25.1	9.6	46.7	46.7	13.9	53.3	68.1
Actuated g/C Ratio	0.11	0.19	0.13	0.21	0.21	0.08	0.39	0.39	0.12	0.44	0.57
v/c Ratio	0.87	0.71	0.85	0.50	0.15	0.57	0.76	0.37	0.72	0.56	0.18
Control Delay	92.6	50.1	83.7	43.4	1.9	62.3	38.4	15.0	62.1	36.9	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.6	50.1	83.7	43.4	1.9	62.3	38.4	15.0	62.1	36.9	11.1
LOS	F	D	F	D	A	E	D	B	E	D	B
Approach Delay		60.8		51.5			35.0			36.0	
Approach LOS		E		D			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 42.2	Intersection LOS: D
Intersection Capacity Utilization 75.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	369	60	165	331	53	69	946	259	125	795	159
Future Volume (veh/h)	144	369	60	165	331	53	69	946	259	125	795	159
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	155	397	31	177	356	57	74	1017	147	134	855	73
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	566	44	201	656	289	92	1459	653	159	1600	871
Arrive On Green	0.11	0.18	0.18	0.12	0.19	0.19	0.02	0.14	0.14	0.03	0.15	0.15
Sat Flow, veh/h	1619	3216	250	1619	3420	1506	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	155	210	218	177	356	57	74	1017	147	134	855	73
Grp Sat Flow(s),veh/h/ln	1619	1710	1756	1619	1710	1506	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	11.3	13.9	14.0	12.9	11.3	3.8	5.5	34.0	10.2	9.9	27.7	4.0
Cycle Q Clear(g_c), s	11.3	13.9	14.0	12.9	11.3	3.8	5.5	34.0	10.2	9.9	27.7	4.0
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	301	309	201	656	289	92	1459	653	159	1600	871
V/C Ratio(X)	0.88	0.70	0.70	0.88	0.54	0.20	0.80	0.70	0.23	0.84	0.53	0.08
Avail Cap(c_a), veh/h	175	413	424	229	941	414	113	1459	653	169	1600	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.82	0.82	0.92	0.92	0.92
Uniform Delay (d), s/veh	52.8	46.4	46.5	51.7	43.7	40.7	58.2	44.2	33.9	57.1	38.7	18.5
Incr Delay (d2), s/veh	36.2	4.3	4.4	25.8	1.0	0.5	23.5	2.3	0.7	27.5	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	6.9	7.1	7.2	5.4	1.6	3.1	16.6	4.5	5.7	13.4	1.7
LnGrp Delay(d),s/veh	89.0	50.8	50.9	77.5	44.7	41.2	81.7	46.5	34.6	84.6	39.9	18.6
LnGrp LOS	F	D	D	E	D	D	F	D	C	F	D	B
Approach Vol, veh/h		583			590			1238			1062	
Approach Delay, s/veh		61.0			54.2			47.2			44.1	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	56.7	18.9	28.1	11.3	61.6	17.0	30.0
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	11.9	36.0	14.9	16.0	7.5	29.7	13.3	13.3
Green Ext Time (p_c), s	0.0	3.7	0.0	5.1	0.0	10.3	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	49.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	67	166	32	68	93	45	1226	200	15	899	60
Future Volume (vph)	67	166	32	68	93	45	1226	200	15	899	60
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	13.0	69.8	69.8	9.2	66.0	66.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	34.2%	10.8%	58.2%	58.2%	7.7%	55.0%	55.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.0	22.0	22.0		22.0	8.0	80.9	80.9	5.9	75.3	75.3
Actuated g/C Ratio	0.18	0.18	0.18		0.18	0.07	0.67	0.67	0.05	0.63	0.63
v/c Ratio	0.41	0.52	0.09		0.84	0.43	0.55	0.20	0.19	0.43	0.06
Control Delay	48.2	48.4	0.5		73.5	74.0	9.4	3.8	71.3	5.8	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	48.4	0.5		73.5	74.0	9.4	3.8	71.3	5.8	0.1
LOS	D	D	A		E	E	A	A	E	A	A
Approach Delay		42.6			73.5		10.6			6.5	
Approach LOS		D			E		B			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 78.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	166	32	68	93	23	45	1226	200	15	899	60
Future Volume (veh/h)	67	166	32	68	93	23	45	1226	200	15	899	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	69	171	14	70	96	20	46	1264	150	15	927	33
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	215	364	309	108	135	24	57	2203	985	27	2139	937
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.07	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1224	1800	1530	331	668	120	1619	3420	1530	1619	3420	1498
Grp Volume(v), veh/h	69	171	14	186	0	0	46	1264	150	15	927	33
Grp Sat Flow(s),veh/h/ln	1224	1800	1530	1120	0	0	1619	1710	1530	1619	1710	1498
Q Serve(g_s), s	0.0	10.1	0.9	10.5	0.0	0.0	3.4	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.7	10.1	0.9	20.6	0.0	0.0	3.4	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	215	364	309	267	0	0	57	2203	985	27	2139	937
V/C Ratio(X)	0.32	0.47	0.05	0.70	0.00	0.00	0.81	0.57	0.15	0.57	0.43	0.04
Avail Cap(c_a), veh/h	315	510	433	390	0	0	128	2203	985	77	2139	937
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.59	0.59	0.59	0.76	0.76	0.76
Uniform Delay (d), s/veh	42.5	42.2	38.6	47.7	0.0	0.0	55.4	0.0	0.0	57.6	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.9	0.1	3.2	0.0	0.0	6.0	0.6	0.2	5.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.1	0.4	6.2	0.0	0.0	1.6	0.2	0.1	0.5	0.1	0.0
LnGrp Delay(d),s/veh	43.3	43.2	38.6	51.0	0.0	0.0	61.4	0.6	0.2	62.8	0.5	0.1
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		254			186			1460			975	
Approach Delay, s/veh		43.0			51.0			2.5			1.4	
Approach LOS		D			D			A			A	

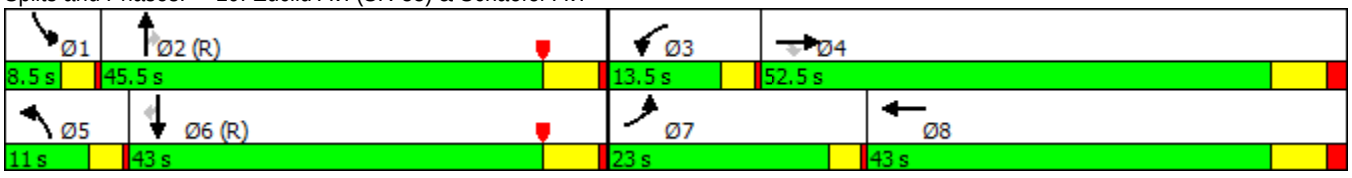
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	83.3		31.2	7.7	81.0		31.2
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	63.8		34.0	9.5	60.0		34.0
Max Q Clear Time (g_c+I1), s	3.1	2.0		12.7	5.4	2.0		22.6
Green Ext Time (p_c), s	0.0	26.8		2.1	0.0	26.2		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	288	217	155	24	47	85	1184	35	22	873	127
Future Volume (vph)	288	217	155	24	47	85	1184	35	22	873	127
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	26.9	26.9	10.0	14.4	10.6	66.3	66.3	5.7	57.9	57.9
Actuated g/C Ratio	0.16	0.22	0.22	0.08	0.12	0.09	0.55	0.55	0.05	0.48	0.48
v/c Ratio	1.13	0.56	0.34	0.19	0.28	0.62	0.65	0.04	0.30	0.55	0.17
Control Delay	142.0	45.5	6.6	54.9	38.5	56.0	27.3	1.5	66.1	26.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.0	45.5	6.6	54.9	38.5	56.0	27.3	1.5	66.1	26.1	7.4
LOS	F	D	A	D	D	E	C	A	E	C	A
Approach Delay		78.4			43.2		28.5			24.6	
Approach LOS		E			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 38.4	Intersection LOS: D
Intersection Capacity Utilization 77.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	288	217	155	24	47	14	85	1184	35	22	873	127
Future Volume (veh/h)	288	217	155	24	47	14	85	1184	35	22	873	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	297	224	84	25	48	9	88	1221	27	23	900	78
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	315	268	76	88	16	101	2014	901	36	1877	821
Arrive On Green	0.16	0.17	0.17	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1475	277	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	297	224	84	25	0	57	88	1221	27	23	900	78
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1751	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	14.1	5.8	1.8	0.0	3.8	6.5	39.1	1.7	1.7	28.3	5.2
Cycle Q Clear(g_c), s	19.5	14.1	5.8	1.8	0.0	3.8	6.5	39.1	1.7	1.7	28.3	5.2
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	315	268	76	0	104	101	2014	901	36	1877	821
V/C Ratio(X)	1.13	0.71	0.31	0.33	0.00	0.55	0.87	0.61	0.03	0.64	0.48	0.10
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	2014	901	67	1877	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.68	0.68	0.68	0.91	0.91	0.91
Uniform Delay (d), s/veh	50.3	46.7	43.2	55.3	0.0	54.9	58.3	35.6	20.6	59.1	33.8	24.3
Incr Delay (d2), s/veh	94.7	2.2	0.5	0.9	0.0	3.3	37.5	0.9	0.0	6.2	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	7.2	2.5	0.8	0.0	1.9	4.0	18.8	0.7	0.8	13.7	2.2
LnGrp Delay(d),s/veh	144.9	48.9	43.7	56.3	0.0	58.1	95.8	36.6	20.6	65.2	34.6	24.5
LnGrp LOS	F	D	D	E		E	F	D	C	E	C	C
Approach Vol, veh/h		605			82			1336			1001	
Approach Delay, s/veh		95.3			57.6			40.1			34.5	
Approach LOS		F			E			D			C	

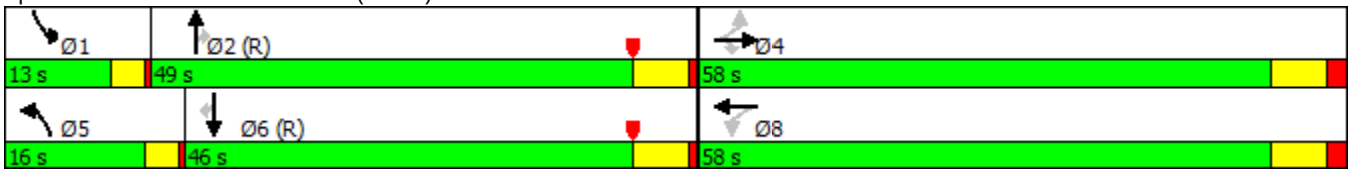
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	76.7	9.2	28.0	11.0	71.9	23.0	14.1
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.7	41.1	3.8	16.1	8.5	30.3	21.5	5.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	5.5	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	49.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	330	452	198	25	132	89	911	70	66	817	163
Future Volume (vph)	330	452	198	25	132	89	911	70	66	817	163
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7	10.4	54.0	54.0	8.5	50.4	50.4
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.09	0.45	0.45	0.07	0.42	0.42
v/c Ratio	0.87	0.72	0.30	0.16	0.26	0.65	0.60	0.10	0.59	0.58	0.23
Control Delay	58.2	39.5	4.2	25.8	24.8	55.4	42.2	19.8	90.4	16.8	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	39.5	4.2	25.8	24.8	55.4	42.2	19.8	90.4	16.8	3.7
LOS	E	D	A	C	C	E	D	B	F	B	A
Approach Delay		38.7			24.9		41.9			19.4	
Approach LOS		D			C		D			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 32.8	Intersection LOS: C
Intersection Capacity Utilization 80.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	452	198	25	132	29	89	911	70	66	817	163
Future Volume (veh/h)	330	452	198	25	132	29	89	911	70	66	817	163
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	337	461	110	26	135	25	91	930	51	67	834	139
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	436	687	576	196	564	105	112	1469	657	83	1407	629
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.02	0.14	0.14	0.10	0.82	0.82
Sat Flow, veh/h	1176	1800	1508	807	1478	274	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	337	461	110	26	0	160	91	930	51	67	834	139
Grp Sat Flow(s),veh/h/ln	1176	1800	1508	807	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	32.8	25.5	5.8	3.3	0.0	7.5	6.7	30.8	3.5	4.9	10.1	2.4
Cycle Q Clear(g_c), s	40.2	25.5	5.8	28.9	0.0	7.5	6.7	30.8	3.5	4.9	10.1	2.4
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	436	687	576	196	0	669	112	1469	657	83	1407	629
V/C Ratio(X)	0.77	0.67	0.19	0.13	0.00	0.24	0.81	0.63	0.08	0.81	0.59	0.22
Avail Cap(c_a), veh/h	487	765	641	231	0	744	169	1469	657	128	1407	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.93	0.93	0.93	0.85	0.85	0.85
Uniform Delay (d), s/veh	38.9	30.8	24.7	42.8	0.0	25.2	57.8	42.6	30.9	53.3	7.2	6.5
Incr Delay (d2), s/veh	6.8	2.0	0.2	0.3	0.0	0.2	8.8	1.9	0.2	8.7	1.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	13.1	2.4	0.8	0.0	3.6	3.3	15.0	1.5	2.4	4.7	1.0
LnGrp Delay(d),s/veh	45.7	32.8	24.9	43.1	0.0	25.4	66.7	44.5	31.1	62.0	8.7	7.2
LnGrp LOS	D	C	C	D		C	E	D	C	E	A	A
Approach Vol, veh/h		908			186			1072			1040	
Approach Delay, s/veh		36.6			27.9			45.8			12.0	
Approach LOS		D			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	57.5		52.8	11.8	55.4		52.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	6.9	32.8		42.2	8.7	12.1		30.9
Green Ext Time (p_c), s	0.0	7.2		3.6	0.0	13.9		5.4

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	47	27	148	5	12	73	957	8	10	1012	49
Future Volume (vph)	47	27	148	5	12	73	957	8	10	1012	49
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.3	15.3	15.3	15.3	15.3	10.3	92.5	92.5	5.5	82.4	82.4
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.09	0.77	0.77	0.05	0.69	0.69
v/c Ratio	0.32	0.13	0.48	0.03	0.11	0.57	0.39	0.01	0.15	0.47	0.05
Control Delay	47.8	41.4	10.1	36.4	25.8	75.0	2.1	0.0	68.4	5.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	41.4	10.1	36.4	25.8	75.0	2.1	0.0	68.4	5.6	0.1
LOS	D	D	B	D	C	E	A	A	E	A	A
Approach Delay		21.8			27.6		7.2			6.0	
Approach LOS		C			C		A			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	27	148	5	12	10	73	957	8	10	1012	49
Future Volume (veh/h)	47	27	148	5	12	10	73	957	8	10	1012	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	51	29	56	5	13	9	79	1040	8	11	1100	53
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	137	126	107	129	69	48	98	2738	1225	21	2575	1127
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.80	0.80	0.03	1.00	1.00
Sat Flow, veh/h	1333	1800	1530	1259	992	687	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	51	29	56	5	0	22	79	1040	8	11	1100	53
Grp Sat Flow(s),veh/h/ln	1333	1800	1530	1259	0	1679	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.5	1.8	4.2	0.5	0.0	1.5	5.8	10.5	0.1	0.8	0.0	0.0
Cycle Q Clear(g_c), s	6.0	1.8	4.2	2.3	0.0	1.5	5.8	10.5	0.1	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	137	126	107	129	0	117	98	2738	1225	21	2575	1127
V/C Ratio(X)	0.37	0.23	0.52	0.04	0.00	0.19	0.81	0.38	0.01	0.53	0.43	0.05
Avail Cap(c_a), veh/h	510	630	535	482	0	588	175	2738	1225	67	2575	1127
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh	55.4	52.8	53.9	53.8	0.0	52.6	55.7	3.4	2.4	58.1	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.7	2.9	0.1	0.0	0.6	10.9	0.4	0.0	12.6	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.9	1.9	0.2	0.0	0.7	2.9	5.1	0.1	0.4	0.2	0.0
LnGrp Delay(d),s/veh	56.7	53.4	56.8	53.9	0.0	53.2	66.6	3.8	2.4	70.7	0.4	0.1
LnGrp LOS	E	D	E	D		D	E	A	A	E	A	A
Approach Vol, veh/h		136			27			1127			1164	
Approach Delay, s/veh		56.0			53.3			8.2			1.1	
Approach LOS		E			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	101.8		13.2	10.8	96.1		13.2
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.8	12.5		8.0	7.8	2.0		4.3
Green Ext Time (p_c), s	0.0	21.9		0.4	0.0	22.3		0.4

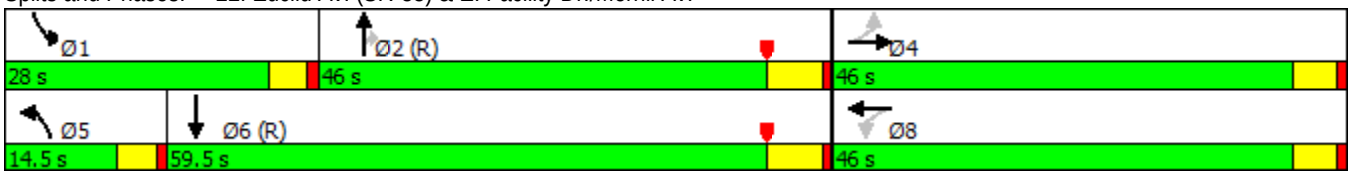
Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	20	98	0	2	961	180	254	886
Future Volume (vph)	5	20	98	0	2	961	180	254	886
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		20.9		20.9	10.0	59.8	59.8	23.9	85.2
Actuated g/C Ratio		0.17		0.17	0.08	0.50	0.50	0.20	0.71
v/c Ratio		0.13		0.65	0.01	0.61	0.24	0.85	0.39
Control Delay		28.9		30.0	75.0	10.9	2.5	49.8	12.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.9		30.0	75.0	10.9	2.5	49.8	12.9
LOS		C		C	E	B	A	D	B
Approach Delay		28.9		30.0		9.7			21.1
Approach LOS		C		C		A			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 16.8 — Intersection LOS: B
Intersection Capacity Utilization 75.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	20	11	98	0	101	2	961	180	254	886	1
Future Volume (veh/h)	5	20	11	98	0	101	2	961	180	254	886	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	22	4	105	0	81	2	1033	165	273	953	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	56	196	32	163	5	93	9	1859	814	296	2528	3
Arrive On Green	0.14	0.14	0.14	0.14	0.00	0.14	0.01	0.54	0.54	0.18	0.72	0.72
Sat Flow, veh/h	144	1356	222	806	33	647	1619	3420	1497	1619	3506	4
Grp Volume(v), veh/h	31	0	0	186	0	0	2	1033	165	273	465	489
Grp Sat Flow(s),veh/h/ln	1722	0	0	1486	0	0	1619	1710	1497	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	12.8	0.0	0.0	0.1	23.7	6.8	19.9	12.5	12.5
Cycle Q Clear(g_c), s	1.8	0.0	0.0	14.6	0.0	0.0	0.1	23.7	6.8	19.9	12.5	12.5
Prop In Lane	0.16		0.13	0.56		0.44	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	283	0	0	261	0	0	9	1859	814	296	1233	1298
V/C Ratio(X)	0.11	0.00	0.00	0.71	0.00	0.00	0.23	0.56	0.20	0.92	0.38	0.38
Avail Cap(c_a), veh/h	613	0	0	549	0	0	135	1859	814	317	1233	1298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.60	0.60	0.60	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	50.1	0.0	0.0	59.4	17.9	14.0	48.2	6.4	6.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.4	0.0	0.0	3.0	0.7	0.3	29.1	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	6.1	0.0	0.0	0.1	11.4	2.9	11.3	6.1	6.4
LnGrp Delay(d),s/veh	44.8	0.0	0.0	51.4	0.0	0.0	62.4	18.6	14.4	77.3	7.3	7.2
LnGrp LOS	D			D			E	B	B	E	A	A
Approach Vol, veh/h		31			186			1200			1227	
Approach Delay, s/veh		44.8			51.4			18.1			22.8	
Approach LOS		D			D			B			C	

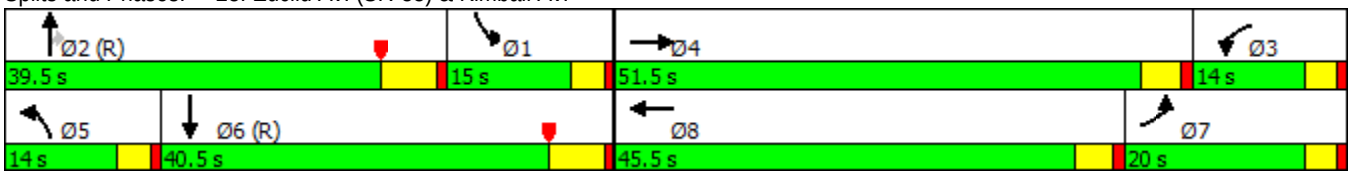
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.5	71.2		22.3	5.1	92.5		22.3
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	21.9	25.7		3.8	2.1	14.5		16.6
Green Ext Time (p_c), s	0.1	9.8		0.7	0.0	17.8		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	307	765	21	224	66	677	24	268	672
Future Volume (vph)	307	765	21	224	66	677	24	268	672
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	35.0	51.9	10.4	18.9	10.2	32.7	32.7	14.8	40.1
Actuated g/C Ratio	0.29	0.43	0.09	0.16	0.08	0.27	0.27	0.12	0.33
v/c Ratio	0.68	0.58	0.16	0.61	0.50	0.76	0.05	1.40	0.70
Control Delay	48.1	28.9	53.1	37.9	47.9	45.8	0.9	250.6	43.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	28.9	53.1	37.9	47.9	45.8	0.9	250.6	43.9
LOS	D	C	D	D	D	D	A	F	D
Approach Delay		34.2		38.8		44.5			98.1
Approach LOS		C		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.40	
Intersection Signal Delay: 57.1	Intersection LOS: E
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	765	48	21	224	120	66	677	24	268	672	82
Future Volume (veh/h)	307	765	48	21	224	120	66	677	24	268	672	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	320	797	46	22	233	91	69	705	10	279	700	67
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	329	932	54	66	294	112	121	821	367	428	1406	134
Arrive On Green	0.20	0.28	0.28	0.04	0.12	0.12	0.02	0.08	0.08	0.26	0.45	0.45
Sat Flow, veh/h	1619	3287	190	1619	2427	921	1619	3420	1530	1619	3151	301
Grp Volume(v), veh/h	320	415	428	22	162	162	69	705	10	279	380	387
Grp Sat Flow(s),veh/h/ln	1619	1710	1767	1619	1710	1637	1619	1710	1530	1619	1710	1742
Q Serve(g_s), s	23.5	27.5	27.5	1.6	11.0	11.6	5.1	24.4	0.7	18.4	19.0	19.0
Cycle Q Clear(g_c), s	23.5	27.5	27.5	1.6	11.0	11.6	5.1	24.4	0.7	18.4	19.0	19.0
Prop In Lane	1.00		0.11	1.00		0.56	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	329	485	501	66	207	199	121	821	367	428	763	777
V/C Ratio(X)	0.97	0.85	0.86	0.33	0.78	0.81	0.57	0.86	0.03	0.65	0.50	0.50
Avail Cap(c_a), veh/h	329	670	692	135	584	559	135	955	427	428	763	777
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	0.89	0.89	0.89	0.93	0.93	0.93
Uniform Delay (d), s/veh	47.5	40.6	40.7	55.9	51.2	51.4	56.6	53.2	42.3	39.2	23.7	23.7
Incr Delay (d2), s/veh	34.2	5.7	5.6	1.1	2.4	3.1	1.8	10.3	0.1	2.6	2.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	13.8	14.2	0.7	5.4	5.4	2.3	12.8	0.3	8.5	9.4	9.6
LnGrp Delay(d),s/veh	81.6	46.4	46.2	57.0	53.6	54.5	58.3	63.5	42.4	41.8	25.8	25.8
LnGrp LOS	F	D	D	E	D	D	E	E	D	D	C	C
Approach Vol, veh/h		1163			346			784			1046	
Approach Delay, s/veh		56.0			54.2			62.8			30.1	
Approach LOS		E			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.7	34.8	8.9	38.5	13.0	59.5	28.4	19.1
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	20.4	26.4	3.6	29.5	7.1	21.0	25.5	13.6
Green Ext Time (p_c), s	0.0	2.4	0.0	4.5	0.0	3.7	0.0	1.0

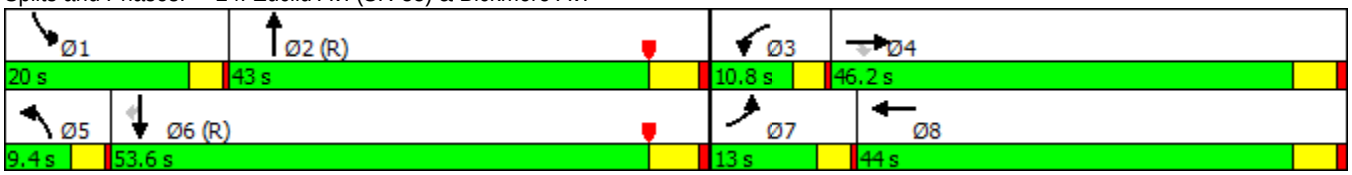
Intersection Summary	
HCM 2010 Ctrl Delay	49.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	66	86	45	32	25	15	645	124	527	54
Future Volume (vph)	66	86	45	32	25	15	645	124	527	54
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.0	17.5	17.5	6.7	13.5	5.6	68.1	13.8	81.5	81.5
Actuated g/C Ratio	0.08	0.15	0.15	0.06	0.11	0.05	0.57	0.12	0.68	0.68
v/c Ratio	0.61	0.37	0.15	0.40	0.40	0.23	0.44	0.75	0.25	0.06
Control Delay	74.5	47.1	1.0	67.5	20.1	82.1	7.9	81.4	2.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.5	47.1	1.0	67.5	20.1	82.1	7.9	81.4	2.1	0.1
LOS	E	D	A	E	C	F	A	F	A	A
Approach Delay		45.7			33.0		9.4		15.9	
Approach LOS		D			C		A		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 52.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	86	45	32	25	61	15	645	100	124	527	54
Future Volume (veh/h)	66	86	45	32	25	61	15	645	100	124	527	54
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	73	96	31	36	28	56	17	717	101	138	586	60
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	91	180	153	47	39	78	29	1881	265	160	2419	1060
Arrive On Green	0.06	0.10	0.10	0.03	0.07	0.07	0.02	0.83	0.83	0.20	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	537	1074	1619	3002	423	1619	3420	1499
Grp Volume(v), veh/h	73	96	31	36	0	84	17	408	410	138	586	60
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1611	1619	1710	1715	1619	1710	1499
Q Serve(g_s), s	5.3	6.1	2.2	2.6	0.0	6.1	1.2	7.0	7.0	9.9	0.0	0.0
Cycle Q Clear(g_c), s	5.3	6.1	2.2	2.6	0.0	6.1	1.2	7.0	7.0	9.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.67	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	91	180	153	47	0	118	29	1071	1075	160	2419	1060
V/C Ratio(X)	0.81	0.53	0.20	0.76	0.00	0.71	0.58	0.38	0.38	0.86	0.24	0.06
Avail Cap(c_a), veh/h	128	618	525	98	0	523	80	1071	1075	223	2419	1060
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.48	0.48	0.48	0.68	0.68	0.68
Uniform Delay (d), s/veh	56.0	51.4	49.6	57.8	0.0	54.4	58.1	4.3	4.3	47.4	0.0	0.0
Incr Delay (d2), s/veh	14.7	0.9	0.2	9.1	0.0	3.0	3.3	0.5	0.5	12.1	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.1	1.0	1.3	0.0	2.8	0.6	3.3	3.4	4.9	0.1	0.0
LnGrp Delay(d),s/veh	70.7	52.3	49.9	67.0	0.0	57.4	61.4	4.8	4.8	59.5	0.2	0.1
LnGrp LOS	E	D	D	E		E	E	A	A	E	A	A
Approach Vol, veh/h		200			120			835			784	
Approach Delay, s/veh		58.6			60.3			6.0			10.6	
Approach LOS		E			E			A			B	

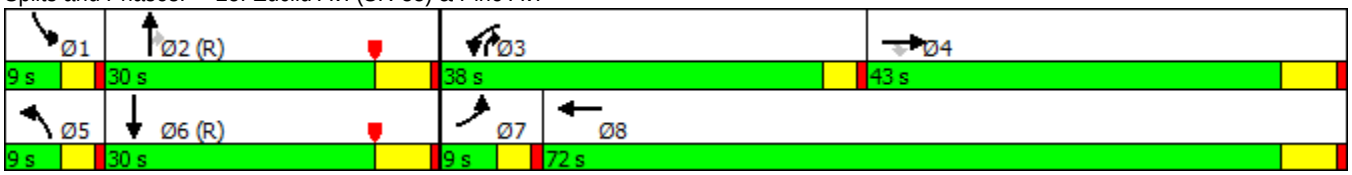
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	80.7	7.0	17.0	5.7	90.4	10.2	13.8
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	11.9	9.0	4.6	8.1	3.2	2.0	7.3	8.1
Green Ext Time (p_c), s	0.1	5.4	0.0	0.6	0.0	5.6	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	16.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	14	323	28	445	71	33	668	1022	56	500
Future Volume (vph)	14	323	28	445	71	33	668	1022	56	500
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	28.4	28.4	34.0	62.8	6.2	29.4	69.4	8.2	35.1
Actuated g/C Ratio	0.04	0.24	0.24	0.28	0.52	0.05	0.24	0.58	0.07	0.29
v/c Ratio	0.21	0.78	0.06	0.55	0.11	0.40	0.82	1.06	0.53	0.53
Control Delay	63.1	55.4	0.2	39.5	10.5	71.4	40.8	52.2	51.1	34.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	55.4	0.2	39.5	10.5	71.4	40.8	52.2	51.1	34.2
LOS	E	E	A	D	B	E	D	D	D	C
Approach Delay		51.4			34.2		48.2			35.8
Approach LOS		D			C		D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 44.0	Intersection LOS: D
Intersection Capacity Utilization 100.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	323	28	445	71	29	33	668	1022	56	500	14
Future Volume (veh/h)	14	323	28	445	71	29	33	668	1022	56	500	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	14	333	0	459	73	24	34	689	621	58	515	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	25	390	331	516	488	160	46	1370	880	67	1420	28
Arrive On Green	0.02	0.22	0.00	0.17	0.38	0.38	0.03	0.40	0.40	0.01	0.14	0.14
Sat Flow, veh/h	1619	1800	1530	2956	1298	427	1619	3420	1530	1619	3430	67
Grp Volume(v), veh/h	14	333	0	459	0	97	34	689	621	58	257	268
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1725	1619	1710	1530	1619	1710	1787
Q Serve(g_s), s	1.0	21.3	0.0	18.2	0.0	4.5	2.5	18.1	34.8	4.3	16.4	16.4
Cycle Q Clear(g_c), s	1.0	21.3	0.0	18.2	0.0	4.5	2.5	18.1	34.8	4.3	16.4	16.4
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	25	390	331	516	0	648	46	1370	880	67	708	739
V/C Ratio(X)	0.56	0.85	0.00	0.89	0.00	0.15	0.74	0.50	0.71	0.86	0.36	0.36
Avail Cap(c_a), veh/h	67	555	472	838	0	949	67	1370	880	67	708	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.10	0.10	0.10	0.98	0.98	0.98
Uniform Delay (d), s/veh	58.7	45.2	0.0	48.4	0.0	24.8	57.9	27.0	18.2	58.8	37.4	37.4
Incr Delay (d2), s/veh	7.0	10.4	0.0	4.4	0.0	0.2	1.0	0.1	0.5	60.5	1.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.8	0.0	7.8	0.0	2.2	1.1	8.5	14.8	3.1	8.0	8.4
LnGrp Delay(d),s/veh	65.6	55.6	0.0	52.8	0.0	24.9	58.8	27.1	18.7	119.4	38.8	38.8
LnGrp LOS	E	E		D		C	E	C	B	F	D	D
Approach Vol, veh/h		347			556			1344			583	
Approach Delay, s/veh		56.0			47.9			24.0			46.8	
Approach LOS		E			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	54.1	24.9	32.0	7.4	55.7	5.9	51.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	6.3	36.8	20.2	23.3	4.5	18.4	3.0	6.5
Green Ext Time (p_c), s	0.0	0.0	0.7	2.7	0.0	3.0	0.0	3.8

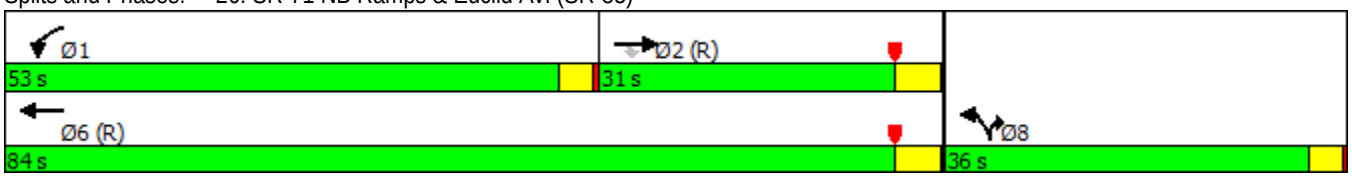
Intersection Summary	
HCM 2010 Ctrl Delay	37.3
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	741	171	289	731	147	1069
Future Volume (vph)	741	171	289	731	147	1069
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	31.0	31.0	53.0	84.0	36.0	36.0
Total Split (%)	25.8%	25.8%	44.2%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	48.2	48.2	27.8	79.5	32.5	32.5
Actuated g/C Ratio	0.40	0.40	0.23	0.66	0.27	0.27
v/c Ratio	0.60	0.26	0.81	0.36	0.18	1.27
Control Delay	34.0	9.8	62.8	2.7	34.2	147.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	9.8	62.8	2.7	34.2	147.3
LOS	C	A	E	A	C	F
Approach Delay	29.5			19.7	133.7	
Approach LOS	C			B	F	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.27
Intersection Signal Delay: 66.6 — Intersection LOS: E
Intersection Capacity Utilization 98.6% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	741	171	289	731	147	1069
Future Volume (veh/h)	741	171	289	731	147	1069
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	823	0	321	812	163	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2161	967	349	2957	229	105
Arrive On Green	1.00	0.00	0.20	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	823	0	321	812	163	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	22.0	5.1	5.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	22.0	5.1	5.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2161	967	349	2957	229	105
V/C Ratio(X)	0.38	0.00	0.92	0.27	0.71	0.00
Avail Cap(c_a), veh/h	2161	967	707	2957	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.84	0.84	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	46.8	1.4	54.7	0.0
Incr Delay (d2), s/veh	0.5	0.0	3.6	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	10.8	2.4	2.8	0.0
LnGrp Delay(d),s/veh	0.5	0.0	50.4	1.6	58.8	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	823			1133	163	
Approach Delay, s/veh	0.5			15.5	58.8	
Approach LOS	A			B	E	

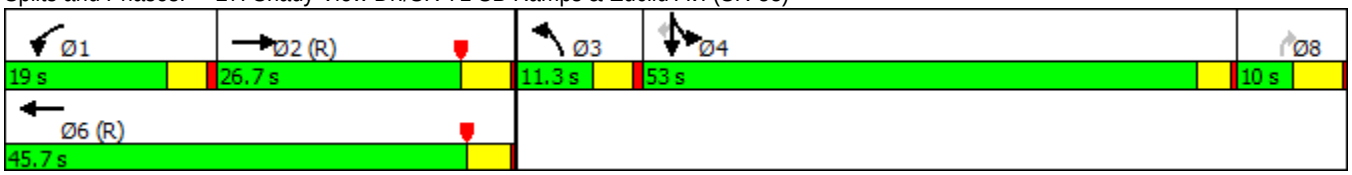
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	27.9	80.3				108.3		11.7
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	49.5	26.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	24.0	2.0				7.1		7.8
Green Ext Time (p_c), s	0.4	9.7				12.1		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	268	97	194	29	15	696	138	150
Future Volume (vph)	268	97	194	29	15	696	138	150
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	26.7	19.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	22.3%	15.8%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	37.8	12.0	54.9	6.5	5.0	40.4	40.4	40.4
Actuated g/C Ratio	0.32	0.10	0.46	0.05	0.04	0.34	0.34	0.34
v/c Ratio	0.30	0.62	0.13	0.34	0.08	0.82	0.78	0.25
Control Delay	34.8	63.9	14.0	65.7	0.8	49.5	45.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	63.9	14.0	65.7	0.8	49.5	45.7	4.5
LOS	C	E	B	E	A	D	D	A
Approach Delay	34.8		30.7				41.0	
Approach LOS	C		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 38.0	Intersection LOS: D
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	268	42	97	194	0	29	0	15	696	138	150
Future Volume (veh/h)	0	268	42	97	194	0	29	0	15	696	138	150
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	276	43	100	200	0	30	0	15	819	0	155
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1575	243	121	2196	0	0	0	0	929	0	439
Arrive On Green	0.00	0.53	0.53	0.15	1.00	0.00	0.00	0.00	0.00	0.29	0.00	0.29
Sat Flow, veh/h	0	3062	458	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	157	162	100	200	0		0.0		819	0	155
Grp Sat Flow(s),veh/h/ln	0	1710	1719	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	5.7	5.8	7.2	0.0	0.0				29.0	0.0	9.6
Cycle Q Clear(g_c), s	0.0	5.7	5.8	7.2	0.0	0.0				29.0	0.0	9.6
Prop In Lane	0.00		0.27	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	906	911	121	2196	0				929	0	439
V/C Ratio(X)	0.00	0.17	0.18	0.83	0.09	0.00				0.88	0.00	0.35
Avail Cap(c_a), veh/h	0	906	911	196	2196	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.6	14.6	50.3	0.0	0.0				40.8	0.0	33.9
Incr Delay (d2), s/veh	0.0	0.4	0.4	14.2	0.1	0.0				5.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.8	2.9	3.7	0.0	0.0				13.6	0.0	4.1
LnGrp Delay(d),s/veh	0.0	15.0	15.1	64.5	0.1	0.0				46.0	0.0	34.4
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		319			300						974	
Approach Delay, s/veh		15.0			21.6						44.1	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.4	68.6		37.9		82.1		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	14.5	21.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.2	7.8		31.0		2.0		
Green Ext Time (p_c), s	0.1	1.7		3.5		2.0		

Intersection Summary	
HCM 2010 Ctrl Delay	34.1
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1075	0	0	422	0	0	0	0	0	0	0
Future Vol, veh/h	0	1075	0	0	422	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1132	0	0	444	0	0	0	0	0	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	444	0	-	-	-	0				1576	1576	444
Stage 1	-	-	-	-	-	-				444	444	-
Stage 2	-	-	-	-	-	-				1132	1132	-
Critical Hdwy	4.1	-	-	-	-	-				6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	1127	-	0	0	-	-				122	111	618
Stage 1	-	-	0	0	-	-				651	579	-
Stage 2	-	-	0	0	-	-				311	281	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1127	-	-	-	-	-				122	0	618
Mov Cap-2 Maneuver	-	-	-	-	-	-				238	0	-
Stage 1	-	-	-	-	-	-				651	0	-
Stage 2	-	-	-	-	-	-				311	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1127	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1045	39	2	396	12	5
Future Vol, veh/h	1045	39	2	396	12	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1124	42	2	426	13	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1166	0	1575	583
Stage 1	-	-	-	-	1145	-
Stage 2	-	-	-	-	430	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	606	-	112	461
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	606	-	112	461
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	658	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	18.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	247	461	-	-	606	-
HCM Lane V/C Ratio	0.052	0.012	-	-	0.004	-
HCM Control Delay (s)	20.4	12.9	-	-	11	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	932	18	325	73	8
Future Volume (vph)	932	18	325	73	8
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	21.1	5.2	22.5	10.4	10.4
Actuated g/C Ratio	0.47	0.12	0.50	0.23	0.23
v/c Ratio	0.69	0.10	0.38	0.20	0.02
Control Delay	11.8	23.2	7.5	18.8	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	23.2	7.5	18.8	12.0
LOS	B	C	A	B	B
Approach Delay	11.8		8.3	18.2	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	932	118	18	325	73	8
Future Volume (veh/h)	932	118	18	325	73	8
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	981	124	19	342	77	6
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1360	172	38	1015	333	315
Arrive On Green	0.45	0.45	0.02	0.56	0.21	0.21
Sat Flow, veh/h	3134	385	1619	1800	1619	1530
Grp Volume(v), veh/h	551	554	19	342	77	6
Grp Sat Flow(s),veh/h/ln	1710	1719	1619	1800	1619	1530
Q Serve(g_s), s	12.9	12.9	0.6	5.0	1.9	0.2
Cycle Q Clear(g_c), s	12.9	12.9	0.6	5.0	1.9	0.2
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	764	768	38	1015	333	315
V/C Ratio(X)	0.72	0.72	0.50	0.34	0.23	0.02
Avail Cap(c_a), veh/h	1007	1012	168	1416	333	315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	11.1	23.7	5.8	16.2	15.5
Incr Delay (d2), s/veh	1.7	1.7	3.8	0.2	1.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	6.4	0.3	2.5	1.0	0.1
LnGrp Delay(d),s/veh	12.8	12.8	27.5	6.0	17.9	15.6
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	1105			361	83	
Approach Delay, s/veh	12.8			7.1	17.7	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.7	28.1				33.9		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	2.6	14.9				7.0		3.9
Green Ext Time (p_c), s	0.0	7.0				10.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	869	33	279	64	21
Future Volume (vph)	869	33	279	64	21
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	20.6	5.7	23.9	10.6	10.6
Actuated g/C Ratio	0.45	0.12	0.52	0.23	0.23
v/c Ratio	0.69	0.18	0.32	0.19	0.06
Control Delay	13.3	25.2	6.4	20.5	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	25.2	6.4	20.5	13.7
LOS	B	C	A	C	B
Approach Delay	13.3		8.4	18.8	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 45.9	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 48.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	869	106	33	279	64	21
Future Volume (veh/h)	869	106	33	279	64	21
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	934	114	35	300	69	17
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1320	161	63	1019	338	319
Arrive On Green	0.43	0.43	0.04	0.57	0.21	0.21
Sat Flow, veh/h	3150	373	1619	1800	1619	1530
Grp Volume(v), veh/h	522	526	35	300	69	17
Grp Sat Flow(s),veh/h/ln	1710	1723	1619	1800	1619	1530
Q Serve(g_s), s	12.0	12.0	1.0	4.2	1.7	0.4
Cycle Q Clear(g_c), s	12.0	12.0	1.0	4.2	1.7	0.4
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	738	743	63	1019	338	319
V/C Ratio(X)	0.71	0.71	0.56	0.29	0.20	0.05
Avail Cap(c_a), veh/h	1024	1032	199	1472	338	319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	22.6	5.4	15.7	15.2
Incr Delay (d2), s/veh	1.4	1.3	2.8	0.2	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	5.8	0.5	2.0	0.9	0.2
LnGrp Delay(d),s/veh	12.5	12.5	25.5	5.6	17.0	15.5
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	1048			335	86	
Approach Delay, s/veh	12.5			7.7	16.7	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.5	26.9				33.3		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.0	14.0				6.2		3.7
Green Ext Time (p_c), s	0.0	6.7				9.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	799	39	13	245	22	20	6	9	52	17	47
Future Vol, veh/h	53	799	39	13	245	22	20	6	9	52	17	47
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	56	850	41	14	261	23	21	6	10	55	18	50

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	284	0	0	895	0	0	1322	1300	450	841	1308	272
Stage 1	-	-	-	-	-	-	988	988	-	300	300	-
Stage 2	-	-	-	-	-	-	334	312	-	541	1008	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1290	-	-	767	-	-	125	163	562	274	161	772
Stage 1	-	-	-	-	-	-	269	328	-	713	669	-
Stage 2	-	-	-	-	-	-	684	661	-	498	321	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1290	-	-	767	-	-	105	152	560	252	151	772
Mov Cap-2 Maneuver	-	-	-	-	-	-	199	246	-	352	238	-
Stage 1	-	-	-	-	-	-	256	313	-	682	657	-
Stage 2	-	-	-	-	-	-	611	649	-	459	306	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.5	22.1	17.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	248	1290	-	-	767	-	-	414
HCM Lane V/C Ratio	0.15	0.044	-	-	0.018	-	-	0.298
HCM Control Delay (s)	22.1	7.9	-	-	9.8	-	-	17.3
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	1.2

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	825	35	18	259	21	12
Future Vol, veh/h	825	35	18	259	21	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	938	40	20	294	24	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	977	0	1292	489
Stage 1	-	-	-	-	957	-
Stage 2	-	-	-	-	335	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	714	-	169	530
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	729	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	714	-	164	530
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	709	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	364	-	-	714	-
HCM Lane V/C Ratio	0.103	-	-	0.029	-
HCM Control Delay (s)	16	-	-	10.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	53.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	836	0	0	0	0	0	277	0	0
Future Vol, veh/h	0	0	0	836	0	0	0	0	0	277	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	899	0	0	0	0	0	298	0	0
Number of Lanes	0	0	0	1	0	0	0	0	0	1	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay	65.7	15.1
HCM LOS	F	C

Lane	NBLn1	EBLn1
Vol Left, %	100%	0%
Vol Thru, %	0%	0%
Vol Right, %	0%	100%
Sign Control	Stop	Stop
Traffic Vol by Lane	277	836
LT Vol	277	0
Through Vol	0	0
RT Vol	0	836
Lane Flow Rate	298	899
Geometry Grp	1	1
Degree of Util (X)	0.495	1.053
Departure Headway (Hd)	6.174	4.217
Convergence, Y/N	Yes	Yes
Cap	587	854
Service Time	4.174	2.268
HCM Lane V/C Ratio	0.508	1.053
HCM Control Delay	15.1	65.7
HCM Lane LOS	C	F
HCM 95th-tile Q	2.7	21.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	0	0
Future Vol, veh/h	0	0	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	0	0
Number of Lanes	0	0	0	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	344	209	412	378	567	807
Future Volume (vph)	344	209	412	378	567	807
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Detector Phase	8	1	2	8	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0
Total Split (s)	36.3	37.0	46.7	36.3	37.0	83.7
Total Split (%)	30.3%	30.8%	38.9%	30.3%	30.8%	69.8%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	Min	None	None	Min
Act Effct Green (s)	25.4	63.4	30.9	61.7	32.5	68.8
Actuated g/C Ratio	0.24	0.61	0.30	0.59	0.31	0.66
v/c Ratio	0.88	0.22	0.83	0.44	1.14	0.73
Control Delay	61.6	3.4	48.1	11.5	117.2	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	3.4	48.1	11.5	117.2	16.7
LOS	E	A	D	B	F	B
Approach Delay	39.6		30.6			58.2
Approach LOS	D		C			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 104.7	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 46.4	Intersection LOS: D
Intersection Capacity Utilization 85.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 55: Archibald Av. & Limonite Av.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	344	209	412	378	567	807
Future Volume (veh/h)	344	209	412	378	567	807
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	387	193	463	425	637	907
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	419	863	605	888	548	1270
Arrive On Green	0.23	0.23	0.32	0.32	0.30	0.67
Sat Flow, veh/h	1810	1615	1900	1615	1810	1900
Grp Volume(v), veh/h	387	193	463	425	637	907
Grp Sat Flow(s),veh/h/ln	1810	1615	1900	1615	1810	1900
Q Serve(g_s), s	22.1	6.7	23.2	17.0	32.0	32.0
Cycle Q Clear(g_c), s	22.1	6.7	23.2	17.0	32.0	32.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	419	863	605	888	548	1270
V/C Ratio(X)	0.92	0.22	0.77	0.48	1.16	0.71
Avail Cap(c_a), veh/h	531	962	744	1006	548	1414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.7	13.0	32.5	14.5	36.9	11.1
Incr Delay (d2), s/veh	17.4	0.0	4.1	0.5	92.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.1	3.0	12.9	11.6	29.8	17.0
LnGrp Delay(d),s/veh	57.1	13.1	36.6	15.0	128.9	12.3
LnGrp LOS	E	B	D	B	F	B
Approach Vol, veh/h	580		888			1544
Approach Delay, s/veh	42.4		26.3			60.4
Approach LOS	D		C			E

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	37.0	38.9				75.9		29.8
Change Period (Y+Rc), s	5.0	5.3				* 5.3		5.3
Max Green Setting (Gmax), s	32.0	41.4				* 79		31.0
Max Q Clear Time (g_c+I1), s	34.0	25.2				34.0		24.1
Green Ext Time (p_c), s	0.0	8.4				12.4		0.4

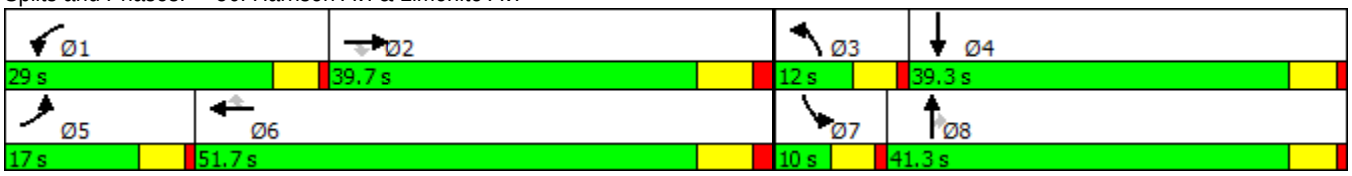
Intersection Summary	
HCM 2010 Ctrl Delay	46.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	76	828	42	200	489	9	38	46	150	12	25
Future Volume (vph)	76	828	42	200	489	9	38	46	150	12	25
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	17.0	39.7	39.7	29.0	51.7	51.7	12.0	41.3	41.3	10.0	39.3
Total Split (%)	14.2%	33.1%	33.1%	24.2%	43.1%	43.1%	10.0%	34.4%	34.4%	8.3%	32.8%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	8.2	21.7	21.7	14.1	31.0	31.0	6.4	15.5	15.5	5.7	10.8
Actuated g/C Ratio	0.11	0.30	0.30	0.20	0.43	0.43	0.09	0.21	0.21	0.08	0.15
v/c Ratio	0.41	0.59	0.08	0.63	0.35	0.01	0.26	0.12	0.35	0.09	0.20
Control Delay	43.9	25.5	0.3	39.8	18.1	0.0	45.1	25.7	6.6	45.7	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.9	25.5	0.3	39.8	18.1	0.0	45.1	25.7	6.6	45.7	20.2
LOS	D	C	A	D	B	A	D	C	A	D	C
Approach Delay		25.9			24.1			16.6			24.8
Approach LOS		C			C			B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 72.1	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	828	42	200	489	9	38	46	150	12	25	27
Future Volume (veh/h)	76	828	42	200	489	9	38	46	150	12	25	27
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	84	920	46	222	543	10	42	51	138	13	28	23
Adj No. of Lanes	1	3	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	112	1759	536	272	1543	690	75	248	208	29	101	83
Arrive On Green	0.06	0.34	0.34	0.15	0.43	0.43	0.04	0.13	0.13	0.02	0.11	0.11
Sat Flow, veh/h	1810	5187	1581	1810	3610	1615	1810	1900	1590	1810	959	788
Grp Volume(v), veh/h	84	920	46	222	543	10	42	51	138	13	0	51
Grp Sat Flow(s),veh/h/ln	1810	1729	1581	1810	1805	1615	1810	1900	1590	1810	0	1748
Q Serve(g_s), s	2.8	8.7	1.2	7.3	6.2	0.2	1.4	1.5	5.1	0.4	0.0	1.6
Cycle Q Clear(g_c), s	2.8	8.7	1.2	7.3	6.2	0.2	1.4	1.5	5.1	0.4	0.0	1.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	112	1759	536	272	1543	690	75	248	208	29	0	184
V/C Ratio(X)	0.75	0.52	0.09	0.82	0.35	0.01	0.56	0.21	0.66	0.44	0.00	0.28
Avail Cap(c_a), veh/h	354	2768	844	709	2633	1178	207	1116	934	148	0	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.3	16.3	13.8	25.2	11.8	10.1	28.8	23.8	25.4	29.9	0.0	25.3
Incr Delay (d2), s/veh	3.7	0.2	0.1	2.3	0.1	0.0	2.4	0.4	3.6	3.9	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.2	0.5	3.8	3.1	0.1	0.7	0.8	2.4	0.2	0.0	0.8
LnGrp Delay(d),s/veh	32.0	16.5	13.9	27.5	12.0	10.1	31.2	24.2	29.0	33.7	0.0	26.1
LnGrp LOS	C	B	B	C	B	B	C	C	C	C		C
Approach Vol, veh/h		1050			775			231			64	
Approach Delay, s/veh		17.6			16.4			28.3			27.6	
Approach LOS		B			B			C			C	

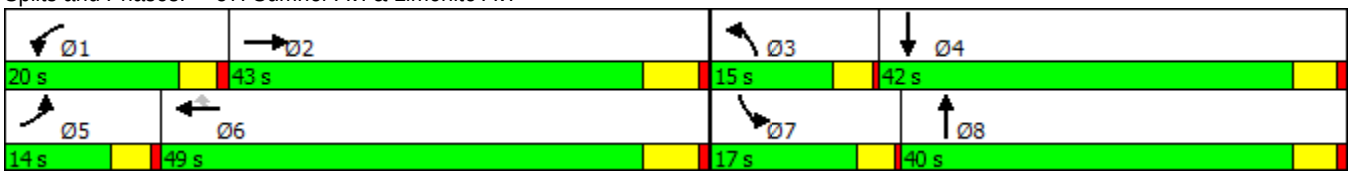
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	27.8	7.6	11.7	8.8	33.2	6.0	13.3
Change Period (Y+Rc), s	5.0	7.0	5.0	5.3	5.0	7.0	5.0	5.3
Max Green Setting (Gmax), s	24.0	32.7	7.0	34.0	12.0	44.7	5.0	36.0
Max Q Clear Time (g_c+I1), s	9.3	10.7	3.4	3.6	4.8	8.2	2.4	7.1
Green Ext Time (p_c), s	0.1	10.0	0.0	0.9	0.0	12.3	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	86	797	190	560	50	48	71	70	124
Future Volume (vph)	86	797	190	560	50	48	71	70	124
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	1	6		3	8	7	4
Permitted Phases					6				
Detector Phase	5	2	1	6	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	14.0	43.0	20.0	49.0	49.0	15.0	40.0	17.0	42.0
Total Split (%)	11.7%	35.8%	16.7%	40.8%	40.8%	12.5%	33.3%	14.2%	35.0%
Yellow Time (s)	3.5	5.0	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.3	19.1	8.5	24.4	24.4	6.4	10.1	7.3	13.1
Actuated g/C Ratio	0.10	0.30	0.13	0.38	0.38	0.10	0.16	0.11	0.20
v/c Ratio	0.26	0.57	0.43	0.29	0.08	0.27	0.36	0.35	0.26
Control Delay	35.6	22.3	33.6	17.7	1.2	38.2	11.3	37.8	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	22.3	33.6	17.7	1.2	38.2	11.3	37.8	17.0
LOS	D	C	C	B	A	D	B	D	B
Approach Delay		23.5		20.4			16.0		22.6
Approach LOS		C		C			B		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 64.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 51.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	797	57	190	560	50	48	71	154	70	124	66
Future Volume (veh/h)	86	797	57	190	560	50	48	71	154	70	124	66
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	89	822	53	196	577	31	49	73	85	72	128	41
Adj No. of Lanes	2	3	0	2	3	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	193	1815	117	313	2068	643	70	236	210	92	387	119
Arrive On Green	0.05	0.36	0.36	0.09	0.40	0.40	0.04	0.13	0.13	0.05	0.14	0.14
Sat Flow, veh/h	3510	4981	320	3510	5187	1614	1810	1805	1604	1810	2707	832
Grp Volume(v), veh/h	89	570	305	196	577	31	49	73	85	72	84	85
Grp Sat Flow(s),veh/h/ln	1755	1729	1843	1755	1729	1614	1810	1805	1604	1810	1805	1734
Q Serve(g_s), s	1.3	6.7	6.7	2.9	4.0	0.6	1.4	2.0	2.6	2.1	2.2	2.4
Cycle Q Clear(g_c), s	1.3	6.7	6.7	2.9	4.0	0.6	1.4	2.0	2.6	2.1	2.2	2.4
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	193	1260	672	313	2068	643	70	236	210	92	258	248
V/C Ratio(X)	0.46	0.45	0.45	0.63	0.28	0.05	0.70	0.31	0.40	0.78	0.32	0.34
Avail Cap(c_a), veh/h	624	2394	1276	1018	4173	1298	372	1182	1050	440	1249	1200
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	12.9	12.9	23.5	10.9	9.9	25.4	21.0	21.3	25.1	20.6	20.6
Incr Delay (d2), s/veh	0.6	0.3	0.5	0.8	0.1	0.0	4.6	0.5	0.9	5.4	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.2	3.5	1.4	1.9	0.3	0.8	1.0	1.2	1.2	1.2	1.2
LnGrp Delay(d),s/veh	25.1	13.2	13.4	24.3	10.9	9.9	30.0	21.6	22.2	30.5	21.1	21.3
LnGrp LOS	C	B	B	C	B	A	C	C	C	C	C	C
Approach Vol, veh/h		964			804			207			241	
Approach Delay, s/veh		14.4			14.2			23.9			24.0	
Approach LOS		B			B			C			C	

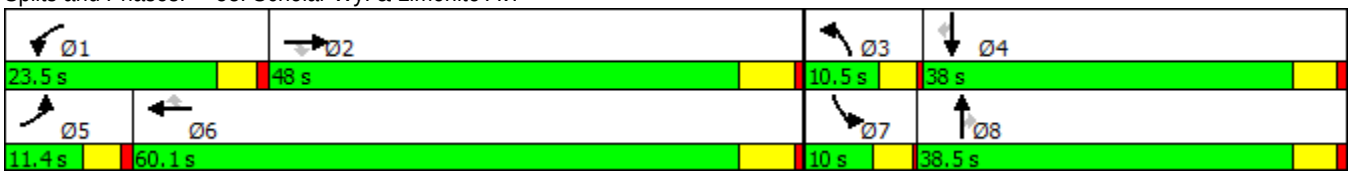
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	25.5	6.1	12.6	7.4	27.3	6.7	12.0
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	15.5	37.0	11.0	37.0	9.5	43.0	13.0	35.0
Max Q Clear Time (g_c+I1), s	4.9	8.7	3.4	4.4	3.3	6.0	4.1	4.6
Green Ext Time (p_c), s	0.2	10.6	0.0	1.4	0.0	11.5	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	945	46	161	791	35	33	26	139	26	71	15
Future Volume (vph)	40	945	46	161	791	35	33	26	139	26	71	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	11.4	48.0	48.0	23.5	60.1	60.1	10.5	38.5	38.5	10.0	38.0	38.0
Total Split (%)	9.5%	40.0%	40.0%	19.6%	50.1%	50.1%	8.8%	32.1%	32.1%	8.3%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	6.1	26.8	26.8	11.6	38.1	38.1	5.8	12.2	12.2	5.6	10.1	10.1
Actuated g/C Ratio	0.09	0.37	0.37	0.16	0.53	0.53	0.08	0.17	0.17	0.08	0.14	0.14
v/c Ratio	0.27	0.71	0.07	0.56	0.42	0.04	0.23	0.08	0.36	0.19	0.14	0.04
Control Delay	45.8	24.6	0.2	41.5	14.2	0.1	45.8	30.2	8.7	45.9	31.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	24.6	0.2	41.5	14.2	0.1	45.8	30.2	8.7	45.9	31.2	0.2
LOS	D	C	A	D	B	A	D	C	A	D	C	A
Approach Delay		24.3			18.1			17.8			30.6	
Approach LOS		C			B			B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 71.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 21.5	Intersection LOS: C
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	945	46	161	791	35	33	26	139	26	71	15
Future Volume (veh/h)	40	945	46	161	791	35	33	26	139	26	71	15
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	41	964	45	164	807	36	34	27	94	27	72	12
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	59	1632	720	207	1928	842	51	198	168	43	360	158
Arrive On Green	0.03	0.45	0.45	0.11	0.53	0.53	0.03	0.10	0.10	0.02	0.10	0.10
Sat Flow, veh/h	1810	3610	1592	1810	3610	1577	1810	1900	1610	1810	3610	1587
Grp Volume(v), veh/h	41	964	45	164	807	36	34	27	94	27	72	12
Grp Sat Flow(s),veh/h/ln	1810	1805	1592	1810	1805	1577	1810	1900	1610	1810	1805	1587
Q Serve(g_s), s	1.4	12.7	1.0	5.6	8.6	0.7	1.2	0.8	3.5	0.9	1.2	0.4
Cycle Q Clear(g_c), s	1.4	12.7	1.0	5.6	8.6	0.7	1.2	0.8	3.5	0.9	1.2	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	1632	720	207	1928	842	51	198	168	43	360	158
V/C Ratio(X)	0.70	0.59	0.06	0.79	0.42	0.04	0.66	0.14	0.56	0.63	0.20	0.08
Avail Cap(c_a), veh/h	196	2374	1047	538	3058	1336	184	997	845	170	1865	820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	13.1	9.9	27.5	8.9	7.1	30.7	26.0	27.2	30.9	26.4	26.1
Incr Delay (d2), s/veh	5.5	0.3	0.0	2.6	0.1	0.0	5.3	0.2	2.2	5.4	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.4	0.4	3.0	4.3	0.3	0.7	0.4	1.7	0.5	0.6	0.2
LnGrp Delay(d),s/veh	36.1	13.4	9.9	30.1	9.1	7.1	36.0	26.2	29.4	36.3	26.6	26.2
LnGrp LOS	D	B	A	C	A	A	D	C	C	D	C	C
Approach Vol, veh/h		1050			1007			155			111	
Approach Delay, s/veh		14.2			12.4			30.3			28.9	
Approach LOS		B			B			C			C	

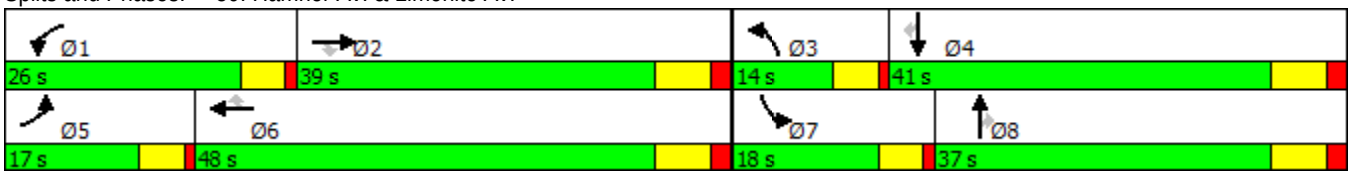
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	34.9	5.8	11.4	6.6	40.1	5.5	11.7
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	19.0	42.0	6.5	33.0	6.9	54.1	6.0	33.5
Max Q Clear Time (g_c+I1), s	7.6	14.7	3.2	3.2	3.4	10.6	2.9	5.5
Green Ext Time (p_c), s	0.1	14.1	0.0	0.6	0.0	17.3	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	212	796	60	424	690	190	139	326	250	222	426	160
Future Volume (vph)	212	796	60	424	690	190	139	326	250	222	426	160
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0
Total Split (s)	17.0	39.0	39.0	26.0	48.0	48.0	14.0	37.0	37.0	18.0	41.0	41.0
Total Split (%)	14.2%	32.5%	32.5%	21.7%	40.0%	40.0%	11.7%	30.8%	30.8%	15.0%	34.2%	34.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	9.7	25.8	25.8	15.7	31.9	31.9	7.6	18.9	18.9	10.1	21.4	21.4
Actuated g/C Ratio	0.10	0.27	0.27	0.16	0.33	0.33	0.08	0.20	0.20	0.11	0.22	0.22
v/c Ratio	0.61	0.58	0.11	0.75	0.58	0.29	0.51	0.32	0.49	0.61	0.54	0.33
Control Delay	51.7	33.0	0.4	48.7	29.4	5.1	52.9	34.7	8.1	51.2	36.0	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	33.0	0.4	48.7	29.4	5.1	52.9	34.7	8.1	51.2	36.0	6.4
LOS	D	C	A	D	C	A	D	C	A	D	D	A
Approach Delay		34.9			32.1			29.0			34.3	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.4	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 32.8	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	796	60	424	690	190	139	326	250	222	426	160
Future Volume (veh/h)	212	796	60	424	690	190	139	326	250	222	426	160
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	216	812	42	433	704	125	142	333	178	227	435	122
Adj No. of Lanes	2	3	1	2	2	1	2	3	1	2	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	286	1530	465	507	1292	577	208	1199	363	297	926	413
Arrive On Green	0.08	0.29	0.29	0.14	0.36	0.36	0.06	0.23	0.23	0.08	0.26	0.26
Sat Flow, veh/h	3510	5187	1577	3510	3610	1611	3510	5187	1571	3510	3610	1611
Grp Volume(v), veh/h	216	812	42	433	704	125	142	333	178	227	435	122
Grp Sat Flow(s),veh/h/ln	1755	1729	1577	1755	1805	1611	1755	1729	1571	1755	1805	1611
Q Serve(g_s), s	5.9	12.8	1.9	11.8	15.2	5.3	3.9	5.2	9.6	6.2	10.0	6.0
Cycle Q Clear(g_c), s	5.9	12.8	1.9	11.8	15.2	5.3	3.9	5.2	9.6	6.2	10.0	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	286	1530	465	507	1292	577	208	1199	363	297	926	413
V/C Ratio(X)	0.76	0.53	0.09	0.85	0.54	0.22	0.68	0.28	0.49	0.76	0.47	0.30
Avail Cap(c_a), veh/h	430	1693	515	752	1510	674	322	1587	481	465	1252	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	28.9	25.0	40.9	25.1	21.9	45.2	31.0	32.7	43.9	30.8	29.3
Incr Delay (d2), s/veh	1.6	0.6	0.2	4.3	0.8	0.4	1.5	0.3	2.2	1.5	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	6.2	0.8	6.0	7.8	2.4	1.9	2.5	4.4	3.1	5.1	2.7
LnGrp Delay(d),s/veh	45.7	29.5	25.2	45.2	25.9	22.3	46.7	31.2	34.9	45.5	31.6	30.2
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1070			1262			653			784	
Approach Delay, s/veh		32.6			32.2			35.6			35.4	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.2	35.9	10.8	32.2	13.0	42.1	13.3	29.7
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	21.0	32.0	9.0	34.0	12.0	41.0	13.0	30.0
Max Q Clear Time (g_c+I1), s	13.8	14.8	5.9	12.0	7.9	17.2	8.2	11.6
Green Ext Time (p_c), s	0.4	13.7	0.0	10.8	0.1	17.9	0.1	9.7

Intersection Summary	
HCM 2010 Ctrl Delay	33.6
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1220	409	425	971	198	0	614
Future Volume (vph)	1220	409	425	971	198	0	614
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	36.5	23.5	23.5	23.5
Total Split (s)	55.0	55.0	23.0	78.0	32.0	32.0	32.0
Total Split (%)	50.0%	50.0%	20.9%	70.9%	29.1%	29.1%	29.1%
Yellow Time (s)	4.5	4.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	Min	Min	Min
Act Effct Green (s)	58.0	58.0	17.1	79.6	19.4	19.4	19.4
Actuated g/C Ratio	0.53	0.53	0.16	0.72	0.18	0.18	0.18
v/c Ratio	0.66	0.40	0.81	0.38	0.61	0.86	0.83
Control Delay	22.7	3.2	47.4	1.6	49.2	45.3	40.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	3.2	47.4	1.6	49.2	45.3	40.4
LOS	C	A	D	A	D	D	D
Approach Delay	17.8			15.5		44.3	
Approach LOS	B			B		D	

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 50 (45%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 73.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1220	409	425	971	0	0	0	0	198	0	614
Future Volume (veh/h)	0	1220	409	425	971	0	0	0	0	198	0	614
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1258	422	438	1001	0				136	0	619
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1816	813	505	2483	0				384	0	685
Arrive On Green	0.00	0.50	0.50	0.10	0.46	0.00				0.21	0.00	0.21
Sat Flow, veh/h	0	3705	1615	3510	3705	0				1810	0	3230
Grp Volume(v), veh/h	0	1258	422	438	1001	0				136	0	619
Grp Sat Flow(s),veh/h/ln	0	1805	1615	1755	1805	0				1810	0	1615
Q Serve(g_s), s	0.0	29.2	19.3	13.5	20.2	0.0				7.0	0.0	20.5
Cycle Q Clear(g_c), s	0.0	29.2	19.3	13.5	20.2	0.0				7.0	0.0	20.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1816	813	505	2483	0				384	0	685
V/C Ratio(X)	0.00	0.69	0.52	0.87	0.40	0.00				0.35	0.00	0.90
Avail Cap(c_a), veh/h	0	1816	813	590	2483	0				436	0	778
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.80	0.80	0.64	0.64	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.8	18.4	48.7	14.7	0.0				36.9	0.0	42.2
Incr Delay (d2), s/veh	0.0	1.8	1.9	7.0	0.3	0.0				0.2	0.0	12.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.9	9.0	7.1	10.2	0.0				3.5	0.0	10.3
LnGrp Delay(d),s/veh	0.0	22.6	20.3	55.7	15.0	0.0				37.1	0.0	54.3
LnGrp LOS		C	C	E	B					D		D
Approach Vol, veh/h		1680			1439						755	
Approach Delay, s/veh		22.0			27.4						51.2	
Approach LOS		C			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	20.3	60.8		28.8		81.2		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	18.5	49.5		26.5		72.5		
Max Q Clear Time (g_c+I1), s	15.5	31.2		22.5		22.2		
Green Ext Time (p_c), s	0.3	11.1		0.8		17.4		

Intersection Summary	
HCM 2010 Ctrl Delay	29.7
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	523	895	1006	167	390	1	646
Future Volume (vph)	523	895	1006	167	390	1	646
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	26.0	72.0	46.0	46.0	38.0	38.0	38.0
Total Split (%)	23.6%	65.5%	41.8%	41.8%	34.5%	34.5%	34.5%
Yellow Time (s)	4.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	20.2	70.7	46.1	46.1	28.3	28.3	28.3
Actuated g/C Ratio	0.18	0.64	0.42	0.42	0.26	0.26	0.26
v/c Ratio	0.82	0.39	0.67	0.22	0.81	0.71	0.69
Control Delay	41.2	19.3	29.9	4.3	52.6	28.3	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	19.3	29.9	4.3	52.6	28.3	27.3
LOS	D	B	C	A	D	C	C
Approach Delay		27.4	26.3			36.2	
Approach LOS		C	C			D	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 29.5 — Intersection LOS: C
Intersection Capacity Utilization 73.1% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	523	895	0	0	1006	167	390	1	646	0	0	0
Future Volume (veh/h)	523	895	0	0	1006	167	390	1	646	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	528	904	0	0	1016	140	529	0	276			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	589	2512	0	0	1758	776	739	0	329			
Arrive On Green	0.34	1.00	0.00	0.00	0.49	0.49	0.20	0.00	0.20			
Sat Flow, veh/h	3510	3705	0	0	3705	1594	3619	0	1613			
Grp Volume(v), veh/h	528	904	0	0	1016	140	529	0	276			
Grp Sat Flow(s),veh/h/ln	1755	1805	0	0	1805	1594	1810	0	1613			
Q Serve(g_s), s	15.7	0.0	0.0	0.0	22.1	5.4	15.0	0.0	18.1			
Cycle Q Clear(g_c), s	15.7	0.0	0.0	0.0	22.1	5.4	15.0	0.0	18.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	589	2512	0	0	1758	776	739	0	329			
V/C Ratio(X)	0.90	0.36	0.00	0.00	0.58	0.18	0.72	0.00	0.84			
Avail Cap(c_a), veh/h	686	2512	0	0	1758	776	1069	0	476			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.71	0.71	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	35.6	0.0	0.0	0.0	20.2	15.9	40.8	0.0	42.0			
Incr Delay (d2), s/veh	9.8	0.3	0.0	0.0	1.4	0.5	1.3	0.0	8.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.3	0.1	0.0	0.0	11.3	2.5	7.6	0.0	8.8			
LnGrp Delay(d),s/veh	45.4	0.3	0.0	0.0	21.5	16.4	42.1	0.0	50.6			
LnGrp LOS	D	A			C	B	D		D			
Approach Vol, veh/h		1432			1156			805				
Approach Delay, s/veh		16.9			20.9			45.0				
Approach LOS		B			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		82.0			23.0	59.1		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		66.5			21.5	40.5		32.5
Max Q Clear Time (g_c+I1), s		2.0			17.7	24.1		20.1
Green Ext Time (p_c), s		12.1			0.8	8.2		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	25.0
HCM 2010 LOS	C

Notes

APPENDIX 3.3:

EXISTING (2016) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

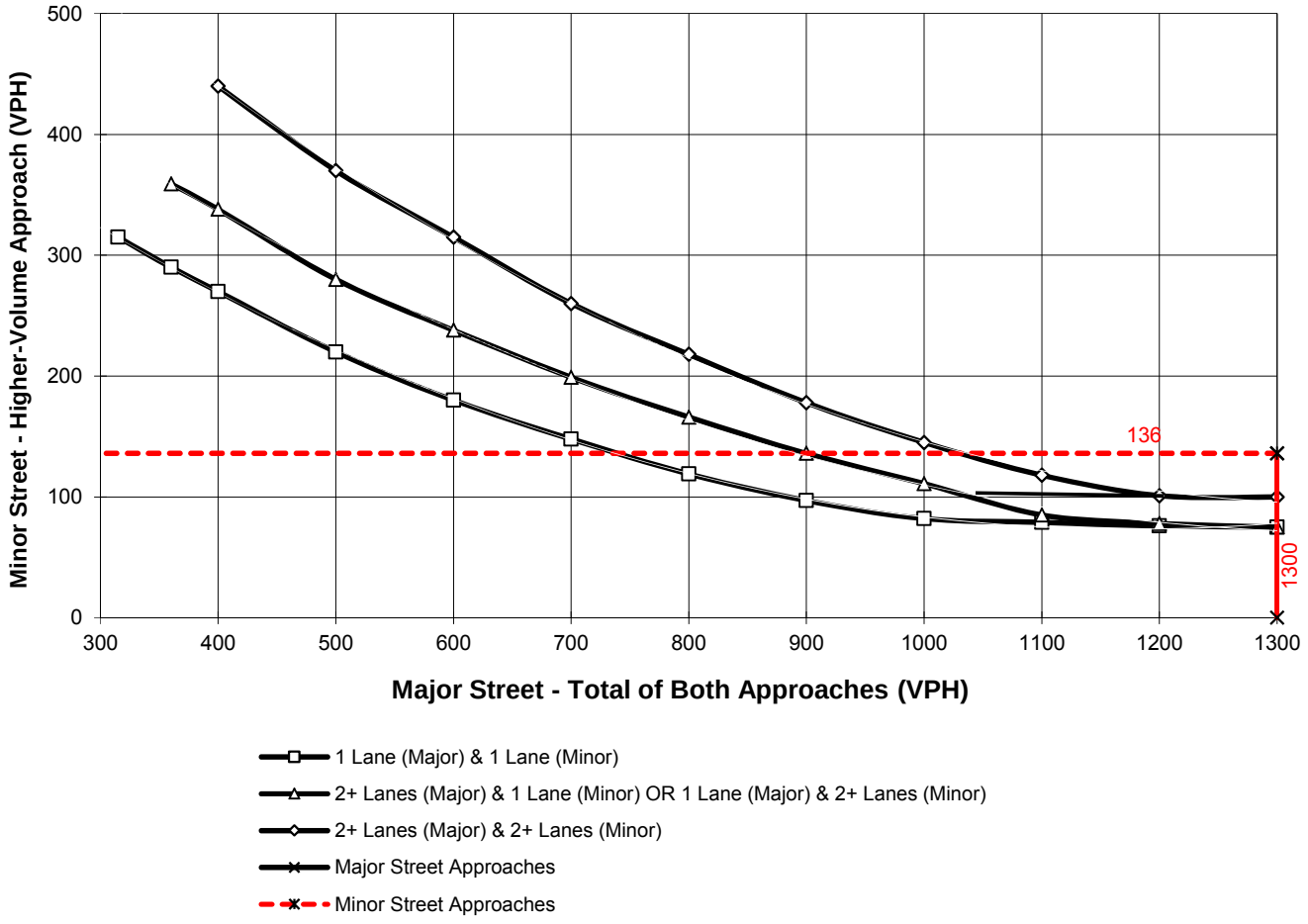
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2016) Conditions - Weekday AM Peak Hour**

Major Street Name = **Chino Hills Pkwy.** Total of Both Approaches (VPH) = **1501**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Monte Vista Av. - West** High Volume Approach (VPH) = **136**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

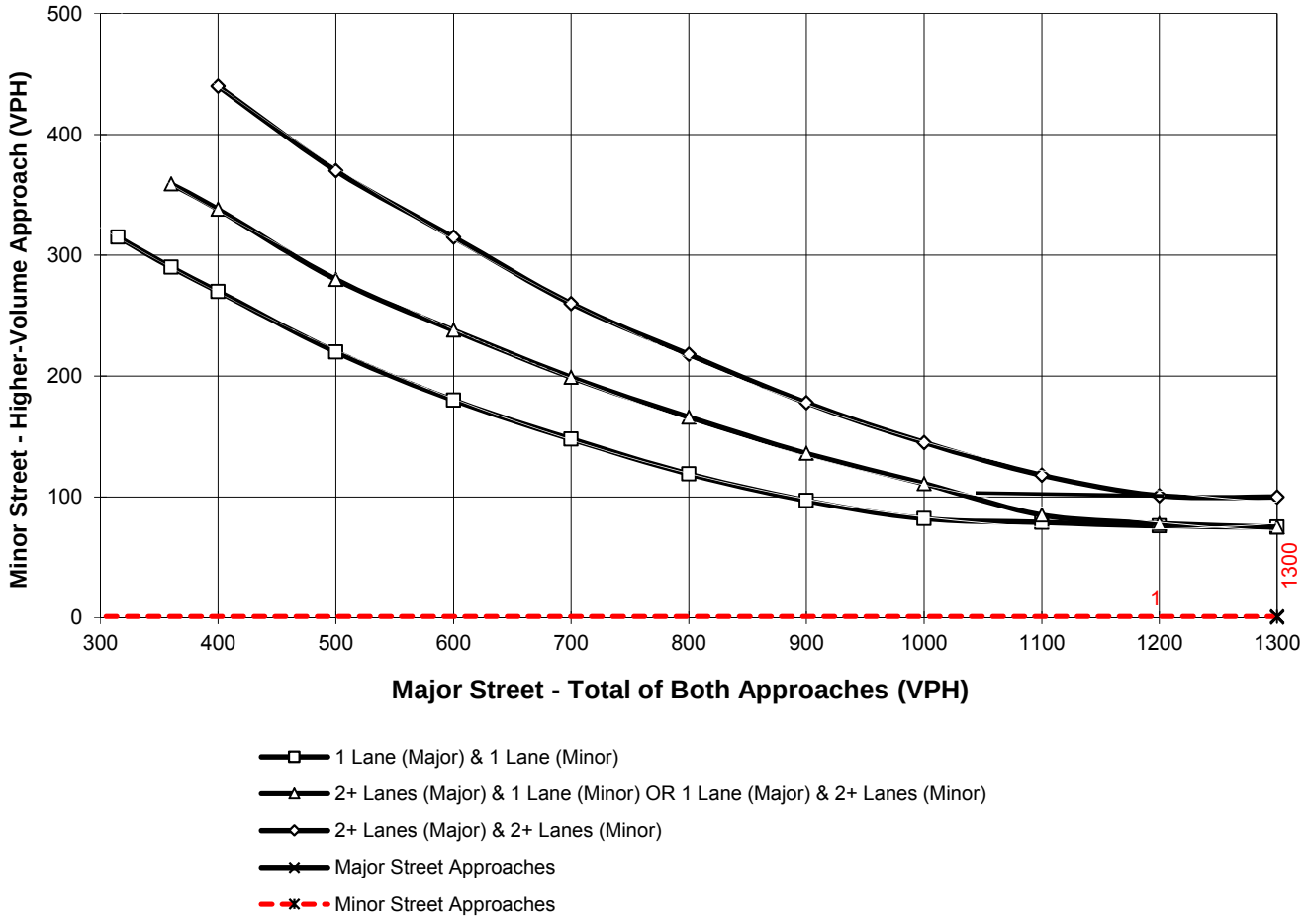
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2016) Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1421**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Fire Station Dwy.** High Volume Approach (VPH) = **1**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

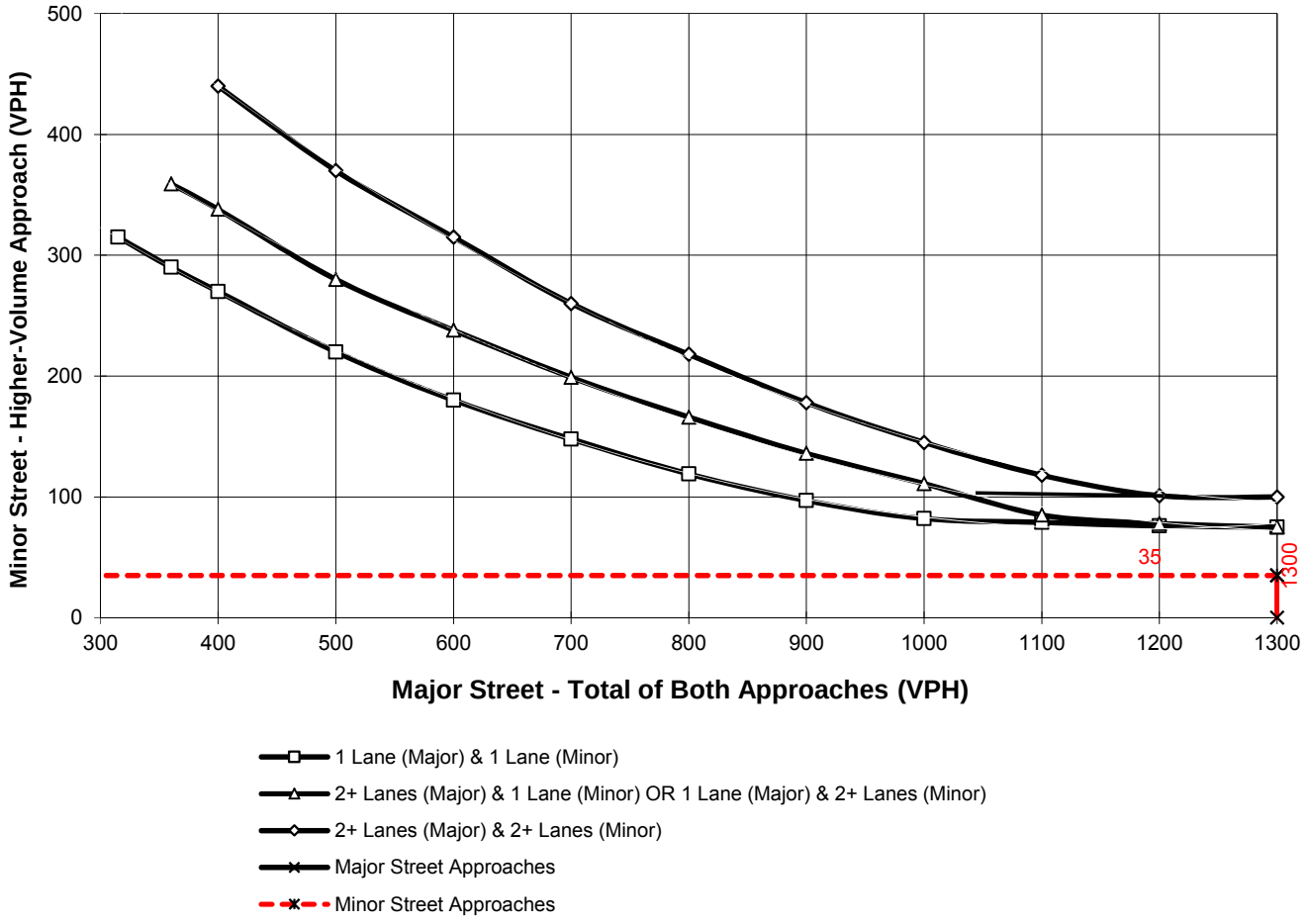
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2016) Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1459**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Rincon Meadows Av.** High Volume Approach (VPH) = **35**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

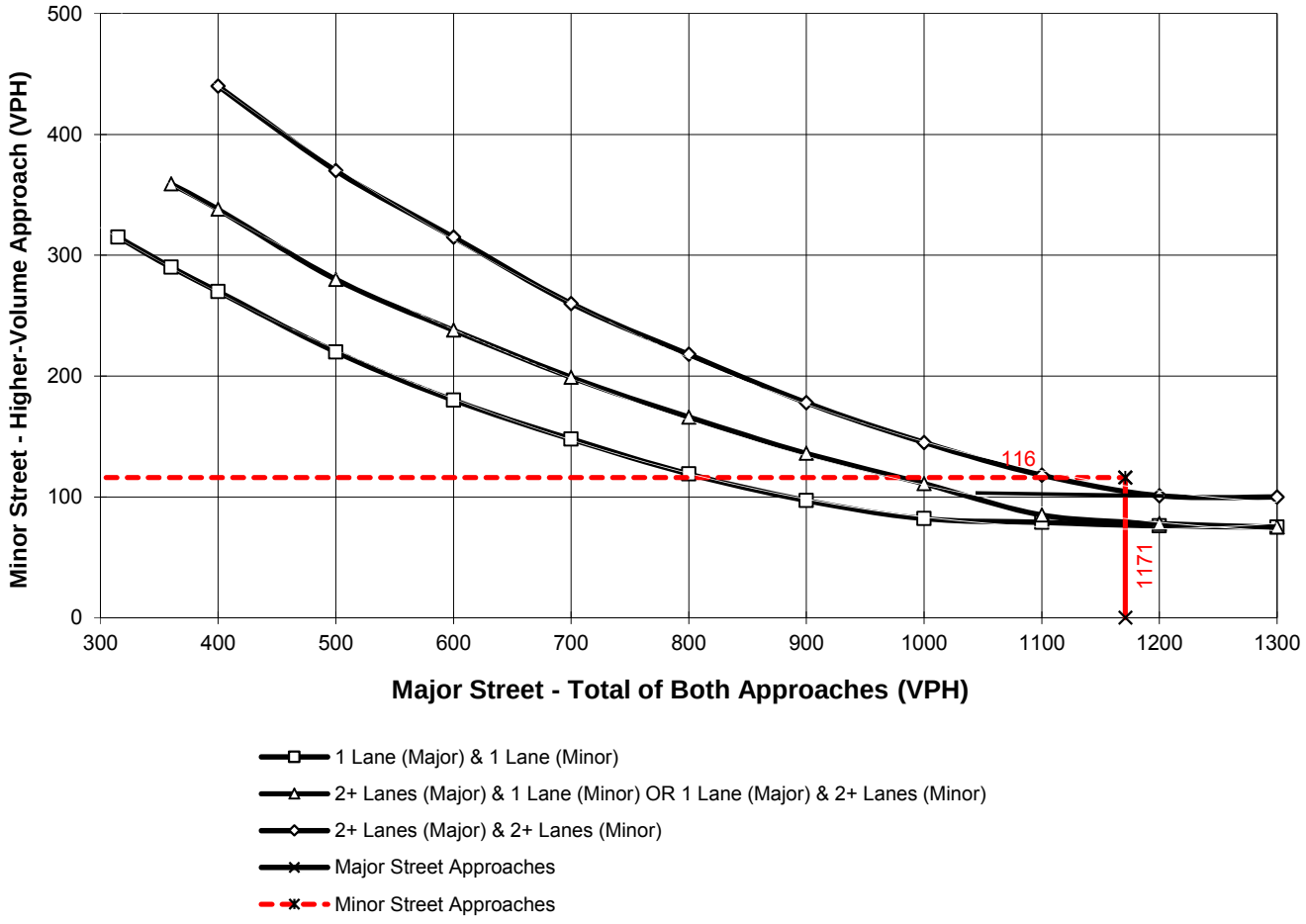
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2016) Conditions - Weekday PM Peak Hour**

Major Street Name = **Kimball Av.**
Total of Both Approaches (VPH) = **1171**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Flight Av.**
High Volume Approach (VPH) = **116**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

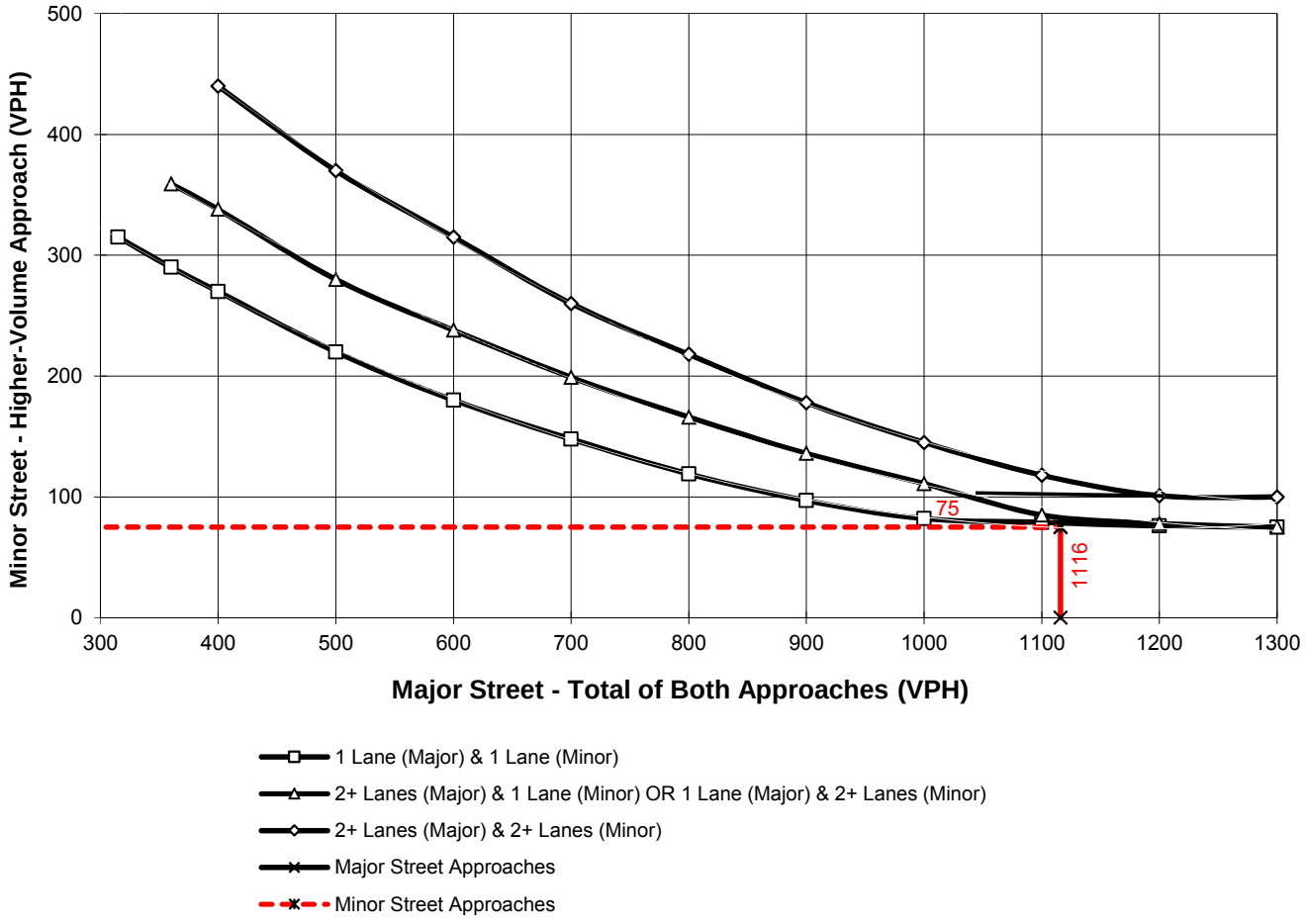
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2016) Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1116**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Meadow Valley Av.** High Volume Approach (VPH) = **75**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

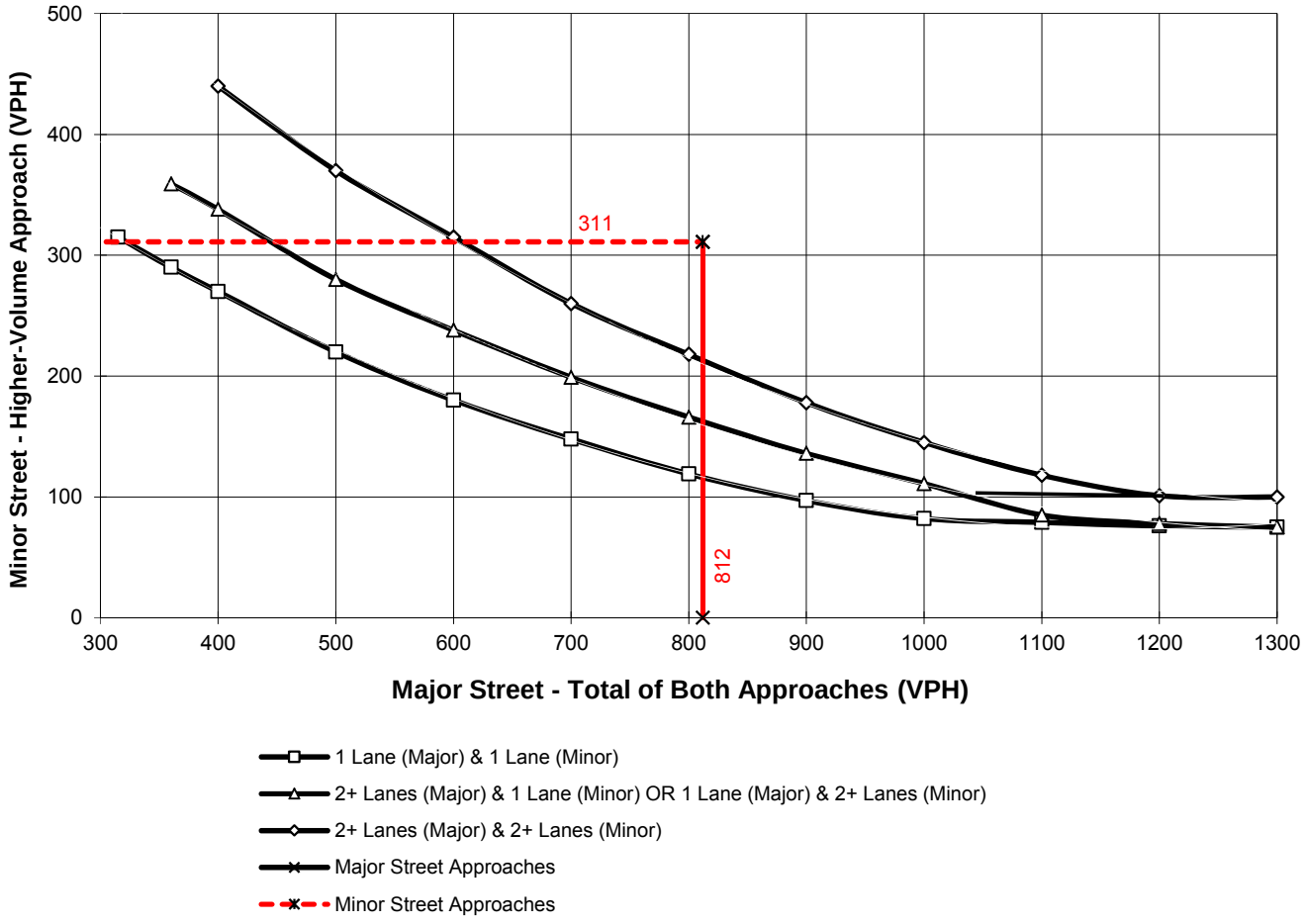
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2016) Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **812**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Hellman Av.** High Volume Approach (VPH) = **311**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 3.4:

EXISTING (2016) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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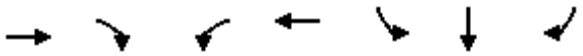


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1187	314	6	945	280	280	396
v/c Ratio	0.40	0.36	0.04	0.54	0.55	0.51	0.67
Control Delay	11.4	3.2	27.0	9.4	21.2	20.0	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	3.2	27.0	9.4	21.2	20.0	18.7
Queue Length 50th (ft)	69	0	2	99	85	84	82
Queue Length 95th (ft)	129	45	m4	m117	155	151	171
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	881	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.36	0.04	0.54	0.55	0.51	0.67

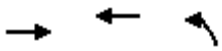
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	565	1132	592	312	194	397
v/c Ratio	0.96	0.50	0.46	0.48	0.99	0.93
Control Delay	57.8	5.9	15.6	10.3	94.1	57.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	5.9	15.6	10.3	94.1	57.7
Queue Length 50th (ft)	117	74	82	41	79	79
Queue Length 95th (ft)	#204	135	122	100	#202	#160
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	589	2251	1282	655	196	428
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.50	0.46	0.48	0.99	0.93

Intersection Summary

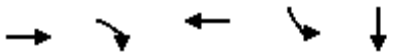
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1183	1005	556
v/c Ratio	0.36	0.31	1.16dr
Control Delay	4.1	7.4	37.7
Queue Delay	0.0	0.0	0.0
Total Delay	4.1	7.4	37.7
Queue Length 50th (ft)	57	79	141
Queue Length 95th (ft)	61	112	162
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3244	3244	1178
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.36	0.31	0.47

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1656	87	935	499	490
v/c Ratio	0.66	0.11	0.37	0.82	0.79
Control Delay	19.3	4.2	10.1	34.6	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	4.2	10.1	34.6	30.5
Queue Length 50th (ft)	247	0	67	253	224
Queue Length 95th (ft)	297	20	73	261	235
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2516	804	2516	775	769
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.11	0.37	0.64	0.64

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	352	348	321	314	963	1030	496
v/c Ratio	0.93	0.90	0.69	0.90	0.44	0.81	0.58
Control Delay	66.7	59.5	25.7	49.0	18.6	32.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	66.7	59.5	25.7	49.0	19.9	32.6	5.2
Queue Length 50th (ft)	204	201	96	161	271	283	0
Queue Length 95th (ft)	#372	#373	196	m#306	337	#395	68
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	400	475	367	2179	1268	850
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.87	0.68	0.86	0.78	0.81	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	310	364	919	571	305	1335
v/c Ratio	0.86	0.89	0.69	0.62	0.88	0.60
Control Delay	55.3	51.1	27.8	5.4	54.3	4.5
Queue Delay	0.2	0.3	0.0	0.0	0.0	0.6
Total Delay	55.5	51.3	27.8	5.4	54.3	5.0
Queue Length 50th (ft)	171	162	245	0	120	54
Queue Length 95th (ft)	#301	#316	321	76	m176	m77
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	449	1324	924	377	2213
Starvation Cap Reductn	0	0	0	0	0	445
Spillback Cap Reductn	4	4	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.82	0.69	0.62	0.81	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	503	301	575	974	72	669
v/c Ratio	0.35	0.37	0.91	0.35	0.19	0.87
Control Delay	47.5	23.7	47.0	0.3	45.6	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	23.7	47.0	0.3	45.6	16.4
Queue Length 50th (ft)	202	108	321	1	27	0
Queue Length 95th (ft)	m238	m121	m268	m5	41	117
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)						
Base Capacity (vph)	1429	814	709	2800	898	902
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.37	0.81	0.35	0.08	0.74

Intersection Summary

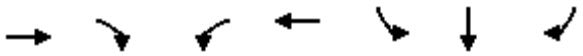
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	833	419	224	66	316	152	151	38
v/c Ratio	1.00	0.83	0.11	0.89	0.82	0.66	0.61	0.11
Control Delay	76.3	62.7	4.4	134.9	23.4	60.1	56.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	62.7	4.4	134.9	23.4	60.1	56.7	0.6
Queue Length 50th (ft)	~374	329	10	52	0	118	117	0
Queue Length 95th (ft)	#504	#565	16	#142	#138	173	171	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	835	502	2042	74	387	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.83	0.11	0.89	0.82	0.41	0.38	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



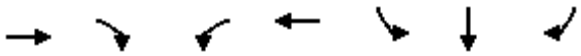
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1213	485	726	614	154	243	243
v/c Ratio	0.68	0.48	0.87	0.22	0.71	0.63	0.60
Control Delay	25.1	5.1	31.2	2.9	63.2	15.3	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	5.1	31.2	2.9	63.2	15.3	11.9
Queue Length 50th (ft)	338	22	170	15	111	13	0
Queue Length 95th (ft)	469	100	226	58	178	95	74
Internal Link Dist (ft)	2381			680		968	
Turn Bay Length (ft)			200		400		
Base Capacity (vph)	1779	1001	939	2790	280	430	454
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.48	0.77	0.22	0.55	0.57	0.54

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	818	582	1141	389	194	192	190
v/c Ratio	0.87	0.21	0.71	0.42	0.76	0.53	0.49
Control Delay	32.4	2.7	29.2	3.7	63.9	14.6	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.4	2.7	29.2	3.7	63.9	14.6	10.4
Queue Length 50th (ft)	284	62	362	0	136	16	0
Queue Length 95th (ft)	257	2	448	58	#225	89	65
Internal Link Dist (ft)		680	1069			1143	
Turn Bay Length (ft)							
Base Capacity (vph)	1002	2711	1597	921	288	390	416
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.21	0.71	0.42	0.67	0.49	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1162	696	18	945	312	321	702
v/c Ratio	0.38	0.70	0.13	0.53	0.64	0.60	1.24
Control Delay	10.7	9.3	36.6	9.0	24.9	23.0	144.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	9.3	36.6	9.0	24.9	23.0	144.4
Queue Length 50th (ft)	64	35	7	76	100	101	~297
Queue Length 95th (ft)	122	#256	m14	97	181	178	#485
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	3044	994	134	1795	485	534	565
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.70	0.13	0.53	0.64	0.60	1.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

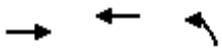
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	425	1166	620	548	181	297
v/c Ratio	0.80	0.55	0.50	0.78	0.74	0.56
Control Delay	36.4	9.1	16.8	19.1	44.9	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	9.1	16.8	19.1	44.9	27.5
Queue Length 50th (ft)	74	57	90	90	69	54
Queue Length 95th (ft)	#142	266	133	#256	#165	91
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1234	702	245	529
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.55	0.50	0.78	0.74	0.56

Intersection Summary

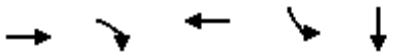
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1176	880	505
v/c Ratio	0.35	0.26	0.99dr
Control Delay	10.7	6.2	38.1
Queue Delay	0.0	0.0	0.0
Total Delay	10.7	6.2	38.1
Queue Length 50th (ft)	126	61	126
Queue Length 95th (ft)	178	98	167
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3361	3361	1132
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.35	0.26	0.45

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	685	86	659	733	841
v/c Ratio	0.53	0.19	0.51	0.74	0.87
Control Delay	31.0	7.6	29.0	15.7	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	7.6	29.0	15.7	23.9
Queue Length 50th (ft)	126	0	125	241	325
Queue Length 95th (ft)	165	36	164	389	#662
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1286	454	1286	1031	998
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.19	0.51	0.71	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	338	331	310	238	1027	901	545
v/c Ratio	0.86	0.82	0.70	0.82	0.48	0.66	0.60
Control Delay	53.2	45.3	27.9	46.3	19.4	26.7	5.2
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	53.2	45.3	27.9	46.3	20.6	26.7	5.2
Queue Length 50th (ft)	186	172	106	121	293	233	0
Queue Length 95th (ft)	#320	#303	201	m#209	368	313	74
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	453	489	331	2144	1356	910
Starvation Cap Reductn	0	0	0	0	839	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.73	0.63	0.72	0.79	0.66	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	340	369	849	567	301	1108
v/c Ratio	0.88	0.84	0.66	0.63	0.88	0.51
Control Delay	57.2	41.5	27.8	5.6	51.9	4.1
Queue Delay	2.4	1.4	0.0	0.0	0.0	0.4
Total Delay	59.6	42.9	27.8	5.6	51.9	4.5
Queue Length 50th (ft)	188	153	224	0	98	34
Queue Length 95th (ft)	#334	#301	296	79	m#271	71
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	476	1280	906	376	2162
Starvation Cap Reductn	0	0	0	0	0	493
Spillback Cap Reductn	28	27	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.82	0.66	0.63	0.80	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	823	190	321	812	163	1188
v/c Ratio	0.60	0.26	0.81	0.36	0.18	1.27
Control Delay	34.0	9.8	62.8	2.7	34.2	147.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	9.8	62.8	2.7	34.2	147.3
Queue Length 50th (ft)	353	40	197	25	50	~736
Queue Length 95th (ft)	423	109	265	31	78	#1000
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)						
Base Capacity (vph)	1374	726	705	2265	898	934
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.26	0.46	0.36	0.18	1.27

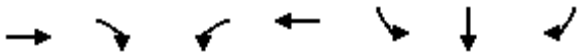
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	319	100	200	30	15	424	436	155
v/c Ratio	0.30	0.62	0.13	0.34	0.08	0.82	0.78	0.25
Control Delay	34.8	63.9	14.0	65.7	0.8	49.5	45.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	63.9	14.0	65.7	0.8	49.5	45.7	4.5
Queue Length 50th (ft)	101	72	35	23	0	311	314	0
Queue Length 95th (ft)	162	126	56	55	0	403	402	40
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1065	196	1563	91	190	632	682	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.51	0.13	0.33	0.08	0.67	0.64	0.21

Intersection Summary



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1258	422	438	1001	184	330	323
v/c Ratio	0.66	0.40	0.81	0.38	0.61	0.86	0.83
Control Delay	22.7	3.2	47.4	1.6	49.2	45.3	40.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	3.2	47.4	1.6	49.2	45.3	40.4
Queue Length 50th (ft)	337	2	112	3	126	141	128
Queue Length 95th (ft)	473	57	184	27	190	249	227
Internal Link Dist (ft)	2381			680		968	
Turn Bay Length (ft)			200		400		
Base Capacity (vph)	1903	1048	595	2612	413	468	481
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.40	0.74	0.38	0.45	0.71	0.67

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	528	904	1016	169	355	347	346
v/c Ratio	0.82	0.39	0.67	0.22	0.81	0.71	0.69
Control Delay	41.2	19.3	29.9	4.3	52.6	28.3	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	19.3	29.9	4.3	52.6	28.3	27.3
Queue Length 50th (ft)	189	305	317	0	242	135	128
Queue Length 95th (ft)	256	371	408	44	347	245	231
Internal Link Dist (ft)		680	1069			1143	
Turn Bay Length (ft)							
Base Capacity (vph)	685	2321	1511	765	506	541	553
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.39	0.67	0.22	0.70	0.64	0.63

Intersection Summary

APPENDIX 3.5:

EXISTING (2016) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3731*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1379*	pc/h/ln
S	*69.6*	mph
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2894*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1059*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3487*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1282*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4002*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2208*	pc/h/ln
S	*58.2*	mph
D = v_p / S	*37.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4120*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1523*	pc/h/ln
S	*68.8*	mph
D = v_p / S	*22.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3156*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1166*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5722*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2198*	pc/h/ln
S	*58.4*	mph
D = v_p / S	*37.6*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4136*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*15*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.930*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1611*	pc/h/ln
S	*68.0*	mph
D = v_p / S	*23.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6394*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1764*	pc/h/ln
S	*66.3*	mph
D = v_p / S	*26.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6492*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1791*	pc/h/ln
S	*65.9*	mph
D = v_p / S	*27.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6488*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1816*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6596*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1846*	pc/h/ln
S	*65.2*	mph
D = v_p / S	*28.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5244*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1966*	pc/h/ln
S	*63.2*	mph
D = v_p / S	*31.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5757*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2148*	pc/h/ln
S	*59.6*	mph
D = v_p / S	*36.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5464*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1990*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*31.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4908*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1787*	pc/h/ln
S	*66.0*	mph
D = v_p / S	*27.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3334*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1226*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2110*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*776*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*11.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3410*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1254*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3215*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1765*	pc/h/ln
S	*66.3*	mph
D = v_p / S	*26.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4059*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1500*	pc/h/ln
S	*69.0*	mph
D = v_p / S	*21.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3104*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1147*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5122*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1939*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*30.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4276*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1642*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6601*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1812*	pc/h/ln
S	*65.7*	mph
D = v_p / S	*27.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6747*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1861*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5925*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1642*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6017*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1668*	pc/h/ln
S	*67.5*	mph
D = v_p / S	*24.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5234*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1963*	pc/h/ln
S	*63.2*	mph
D = v_p / S	*31.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5249*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1968*	pc/h/ln
S	*63.2*	mph
D = v_p / S	*31.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4771*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1746*	pc/h/ln
S	*66.5*	mph
D = v_p / S	*26.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/6/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*Existing (2016)*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5104*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1868*	pc/h/ln
S	*64.8*	mph
D = v_p / S	*28.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 3.6:

EXISTING (2016) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 3731	
	Ramp Volume, V_R: 837	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3731	0.92	Level	4	0	0.980	1.00	4137
Ramp	837	0.92	Level	11	0	0.948	1.00	960
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = 0.00 (Equation 13-12 or 13-13)

P_{FD} = 0.612 using Equation (Exhibit 13-7)

V_{12} = 2906 pc/h

V_3 or V_{av34} 1231 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4137	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3177	Exhibit 13-8	7200	No
V_R	960	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2906	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)

S_R = 59.2 mph (Exhibit 13-12)

S_0 = 75.9 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 169 veh/h
	Freeway Volume, V_F: 3487	
	Ramp Volume, V_R: 699	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3487	0.92	Level	3	0	0.985	1.00	3847
Ramp	699	0.92	Level	10	0	0.952	1.00	798
UpStream								
DownStream	169	0.92	Level	19	0	0.913	1.00	201

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = 0.00 (Equation 13-12 or 13-13)

P_{FD} = 0.627 using Equation (Exhibit 13-7)

V_{12} = 2710 pc/h

V_3 or V_{av34} 1137 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3847	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3049	Exhibit 13-8	7200	No
V_R	798	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2710	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.370 (Exhibit 13-12)

S_R = 59.6 mph (Exhibit 13-12)

S_0 = 76.3 mph (Exhibit 13-12)

S = 63.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 264 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3131	
	Ramp Volume, V_R: 360	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3131	0.92	Level	2	0	0.990	1.00	3437
Ramp	360	0.92	Level	14	0	0.935	1.00	419
UpStream	264	0.92	Level	11	0	0.948	1.00	303
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3437 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3856	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3856	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.482 (Exibit 13-11)

S_R = 56.5 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 511 veh/h
	Freeway Volume, V_F: 3131	
	Ramp Volume, V_R: 360	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3131	0.92	Level	2	0	0.990	1.00	3437
Ramp	360	0.92	Level	14	0	0.935	1.00	419
UpStream								
DownStream	511	0.92	Level	1	0	0.995	1.00	558

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3437 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3856	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3856	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.482 (Exibit 13-11)

S_R = 56.5 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3156	
	Ramp Volume, V_R: 964	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3156	0.92	Level	4	0	0.980	1.00	3499
Ramp	964	0.92	Level	6	0	0.971	1.00	1079
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 976.38 (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2065 pc/h

V_3 or V_{av34} = 1434 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2065 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4578	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3144	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 26.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.371 (Exibit 13-11)

S_R = 59.6 mph (Exhibit 13-11)

S_0 = 66.6 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	750 veh/h	Freeway Volume, V_F	4996	V_D =	veh/h
		Ramp Volume, V_R	726		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4996	0.92	Level	12	0	0.943	1.00	5756
Ramp	726	0.92	Level	9	0	0.957	1.00	825
UpStream	750	0.92	Level	2	0	0.990	1.00	823
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3405 pc/h

V_3 or V_{av34} = 2351 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3405 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6581	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4230	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 35.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.544 (Exibit 13-11)

S_R = 54.8 mph (Exhibit 13-11)

S_0 = 63.2 mph (Exhibit 13-11)

S = 57.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 797 veh/h
	Freeway Volume, V_F: 4136	
	Ramp Volume, V_R: 638	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4136	0.92	Level	15	0	0.930	1.00	4833
Ramp	638	0.92	Level	9	0	0.957	1.00	725
UpStream								
DownStream	797	0.92	Level	4	0	0.980	1.00	884

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.606 using Equation (Exhibit 13-7)

V_{12} = 3214 pc/h

V_3 or V_{av34} 1619 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4833	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4108	Exhibit 13-8	7200	No
V_R	725	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3214	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.363 (Exhibit 13-12)

S_R= 59.8 mph (Exhibit 13-12)

S_0= 74.4 mph (Exhibit 13-12)

S = 64.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 738 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	5754
Ramp Volume, V_R	640
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5754	0.92	Level	1	0	0.995	1.00	6286
Ramp	640	0.92	Level	17	0	0.922	1.00	755
UpStream	738	0.92	Level	21	0	0.905	1.00	886
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.123 using Equation (Exhibit 13-6)
V_{12} = 776 pc/h
V_3 or V_{av34} = 2755 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2514 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7041	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3269	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.9 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.356 (Exibit 13-11)
S_R = 60.0 mph (Exhibit 13-11)
S_0 = 65.0 mph (Exhibit 13-11)
S = 62.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 640 veh/h
	Freeway Volume, V_F: 6492	
	Ramp Volume, V_R: 738	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6492	0.92	Level	3	0	0.985	1.00	7162
Ramp	738	0.92	Level	21	0	0.905	1.00	886
UpStream								
DownStream	640	0.92	Level	17	0	0.922	1.00	755

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3622 pc/h

V_3 or V_{av34} 1770 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7162	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6276	Exhibit 13-8	9600	No
V_R	886	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3622	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.378 (Exhibit 13-12)

S_R = 59.4 mph (Exhibit 13-12)

S_0 = 73.8 mph (Exhibit 13-12)

S = 65.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 649 veh/h
	Freeway Volume, V_F: 6488	
	Ramp Volume, V_R: 541	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6488	0.92	Level	6	0	0.971	1.00	7264
Ramp	541	0.92	Level	18	0	0.917	1.00	641
UpStream								
DownStream	649	0.92	Level	19	0	0.913	1.00	772

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3529 pc/h

V_3 or V_{av34} 1867 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7264	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6623	Exhibit 13-8	9600	No
V_R	641	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3529	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.356 (Exhibit 13-12)

S_R= 60.0 mph (Exhibit 13-12)

S_0= 73.4 mph (Exhibit 13-12)

S = 66.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 541 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5947
Ramp Volume, V_R	649
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5947	0.92	Level	5	0	0.976	1.00	6626
Ramp	649	0.92	Level	19	0	0.913	1.00	772
UpStream	541	0.92	Level	18	0	0.917	1.00	641
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.121 using Equation (Exhibit 13-6)
V_{12} = 804 pc/h
V_3 or V_{av34} = 2911 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2650 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7398	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3422	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.7 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.395 (Exibit 13-11)
S_R = 58.9 mph (Exhibit 13-11)
S_0 = 64.6 mph (Exhibit 13-11)
S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1930 ft
V_u = veh/h	Deceleration Lane Length L_D: 200	V_D = 1028 veh/h
	Freeway Volume, V_F: 5244	
	Ramp Volume, V_R: 515	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5244	0.92	Level	7	0	0.966	1.00	5899
Ramp	515	0.92	Level	17	0	0.922	1.00	607
UpStream								
DownStream	1028	0.92	Level	9	0	0.957	1.00	1168

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.585 using Equation (Exhibit 13-7)

V_{12} = 3701 pc/h

V_3 or V_{av34} 2198 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5899	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	5292	Exhibit 13-8	7200	No
V_R	607	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3701	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.353 (Exhibit 13-12)

S_R= 60.1 mph (Exhibit 13-12)

S_0= 72.1 mph (Exhibit 13-12)

S = 64.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 1930 ft
V_u = 515 veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	675
Deceleration Lane Length L_D	
Freeway Volume, V_F	4729
Ramp Volume, V_R	1028
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4729	0.92	Level	6	0	0.971	1.00	5294
Ramp	1028	0.92	Level	9	0	0.957	1.00	1168
UpStream	515	0.92	Level	17	0	0.922	1.00	607
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1633.97 (Equation 13-6 or 13-7)
P_{FM} = 0.596 using Equation (Exhibit 13-6)
V_{12} = 3157 pc/h
V_3 or V_{av34} = 2137 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3157 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6462	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4325	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 34.4 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.555 (Exibit 13-11)
S_R = 54.5 mph (Exhibit 13-11)
S_0 = 64.1 mph (Exhibit 13-11)
S = 57.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 2010 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 481 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4427	
	Ramp Volume, V_R: 1037	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4427	0.92	Level	0	0	1.000	1.00	4812
Ramp	1037	0.92	Level	7	0	0.966	1.00	1167
UpStream	481	0.92	Level	9	0	0.957	1.00	546
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1541.71 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 2873 pc/h

V_3 or V_{av34} = 1939 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2873 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5979	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4040	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 32.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.480 (Exibit 13-11)

S_R = 56.6 mph (Exhibit 13-11)

S_0 = 64.8 mph (Exhibit 13-11)

S = 59.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2010 ft
V_u = veh/h	Deceleration Lane Length L_D: 200	V_D = 1037 veh/h
	Freeway Volume, V_F: 4908	
	Ramp Volume, V_R: 481	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4908	0.92	Level	1	0	0.995	1.00	5361
Ramp	481	0.92	Level	9	0	0.957	1.00	546
UpStream								
DownStream	1037	0.92	Level	7	0	0.966	1.00	1167

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.601 using Equation (Exhibit 13-7)

V_{12} = 3439 pc/h

V_3 or V_{av34} 1922 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5361	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4815	Exhibit 13-8	7200	No
V_R	546	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3439	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.347 (Exhibit 13-12)

S_R = 60.3 mph (Exhibit 13-12)

S_0 = 73.2 mph (Exhibit 13-12)

S = 64.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 3334	
	Ramp Volume, V_R: 1224	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3334	0.92	Level	3	0	0.985	1.00	3678
Ramp	1224	0.92	Level	4	0	0.980	1.00	1357
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.606 using Equation (Exhibit 13-7)

V_{12} = 2763 pc/h

V_3 or V_{av34} 915 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3678	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2321	Exhibit 13-8	7200	No
V_R	1357	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2763	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.420 (Exhibit 13-12)

S_R = 58.2 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 62.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 325 veh/h
	Freeway Volume, V_F: 3410	
	Ramp Volume, V_R: 1481	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3410	0.92	Level	3	0	0.985	1.00	3762
Ramp	1481	0.92	Level	4	0	0.980	1.00	1642
UpStream								
DownStream	325	0.92	Level	3	0	0.985	1.00	359

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.590 using Equation (Exhibit 13-7)

V_{12} = 2894 pc/h

V_3 or V_{av34} 868 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3762	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2120	Exhibit 13-8	7200	No
V_R	1642	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2894	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.446 (Exhibit 13-12)

S_R= 57.5 mph (Exhibit 13-12)

S_0= 76.8 mph (Exhibit 13-12)

S = 61.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 952 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2596	
	Ramp Volume, V_R: 554	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2596	0.92	Level	1	0	0.995	1.00	2836
Ramp	554	0.92	Level	5	0	0.976	1.00	617
UpStream	952	0.92	Level	4	0	0.980	1.00	1055
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2836 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3453	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3453	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 29.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.420 (Exibit 13-11)

S_R = 58.2 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 58.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 65 veh/h
	Freeway Volume, V_F: 2596	
	Ramp Volume, V_R: 554	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2596	0.92	Level	1	0	0.995	1.00	2836
Ramp	554	0.92	Level	5	0	0.976	1.00	617
UpStream								
DownStream	65	0.92	Level	8	0	0.962	1.00	73

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2836 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3453	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3453	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 29.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.420 (Exibit 13-11)

S_R = 58.2 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 58.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3104	
	Ramp Volume, V_R: 955	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3104	0.92	Level	4	0	0.980	1.00	3441
Ramp	955	0.92	Level	4	0	0.980	1.00	1059
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2031 pc/h

V_3 or V_{av34} = 1410 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2031 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4500	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3090	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 26.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.366 (Exibit 13-11)

S_R = 59.7 mph (Exhibit 13-11)

S_0 = 66.7 mph (Exhibit 13-11)

S = 61.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	363 veh/h	Freeway Volume, V_F	4627	V_D =	veh/h
		Ramp Volume, V_R	495		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4627	0.92	Level	8	0	0.962	1.00	5231
Ramp	495	0.92	Level	10	0	0.952	1.00	565
UpStream	363	0.92	Level	2	0	0.990	1.00	399
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3094 pc/h

V_3 or V_{av34} = 2137 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3094 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5796	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3659	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.427 (Exibit 13-11)

S_R = 58.0 mph (Exhibit 13-11)

S_0 = 64.1 mph (Exhibit 13-11)

S = 60.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 450 veh/h
	Freeway Volume, V_F: 4276	
	Ramp Volume, V_R: 1134	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4276	0.92	Level	12	0	0.943	1.00	4927
Ramp	1134	0.92	Level	8	0	0.962	1.00	1282
UpStream								
DownStream	450	0.92	Level	2	0	0.990	1.00	494

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.578 using Equation (Exhibit 13-7)

V_{12} = 3388 pc/h

V_3 or V_{av34} 1539 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4927	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3645	Exhibit 13-8	7200	No
V_R	1282	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3388	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.413 (Exhibit 13-12)

S_R= 58.4 mph (Exhibit 13-12)

S_0= 74.7 mph (Exhibit 13-12)

S = 62.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 827 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	5920
Ramp Volume, V_R	681
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5920	0.92	Level	2	0	0.990	1.00	6499
Ramp	681	0.92	Level	10	0	0.952	1.00	777
UpStream	827	0.92	Level	10	0	0.952	1.00	944
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.121 using Equation (Exhibit 13-6)
V_{12} = 784 pc/h
V_3 or V_{av34} = 2857 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2599 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7276	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3376	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.7 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.368 (Exibit 13-11)
S_R = 59.7 mph (Exhibit 13-11)
S_0 = 64.8 mph (Exhibit 13-11)
S = 62.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 681 veh/h
	Freeway Volume, V_F: 6747	
	Ramp Volume, V_R: 827	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6747	0.92	Level	3	0	0.985	1.00	7444
Ramp	827	0.92	Level	10	0	0.952	1.00	944
UpStream								
DownStream	681	0.92	Level	10	0	0.952	1.00	777

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3778 pc/h

V_3 or V_{av34} 1833 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7444	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6500	Exhibit 13-8	9600	No
V_R	944	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3778	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.2 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.383 (Exhibit 13-12)

S_R = 59.3 mph (Exhibit 13-12)

S_0 = 73.5 mph (Exhibit 13-12)

S = 65.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 713 veh/h
	Freeway Volume, V_F: 5925	
	Ramp Volume, V_R: 621	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5925	0.92	Level	4	0	0.980	1.00	6569
Ramp	621	0.92	Level	11	0	0.948	1.00	712
UpStream								
DownStream	713	0.92	Level	14	0	0.935	1.00	829

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3266 pc/h

V_3 or V_{av34} 1651 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6569	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5857	Exhibit 13-8	9600	No
V_R	712	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3266	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.362 (Exhibit 13-12)

S_R= 59.9 mph (Exhibit 13-12)

S_0= 74.3 mph (Exhibit 13-12)

S = 66.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 621 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5304
Ramp Volume, V_R	713
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5304	0.92	Level	3	0	0.985	1.00	5852
Ramp	713	0.92	Level	14	0	0.935	1.00	829
UpStream	621	0.92	Level	11	0	0.948	1.00	712
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.114 using Equation (Exhibit 13-6)
V_{12} = 668 pc/h
V_3 or V_{av34} = 2592 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2340 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6681	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3169	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.7 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.369 (Exibit 13-11)
S_R = 59.7 mph (Exhibit 13-11)
S_0 = 65.5 mph (Exhibit 13-11)
S = 62.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1930 ft
V_u = veh/h	Deceleration Lane Length L_D: 200	V_D = 792 veh/h
	Freeway Volume, V_F: 5234	
	Ramp Volume, V_R: 777	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5234	0.92	Level	7	0	0.966	1.00	5888
Ramp	777	0.92	Level	6	0	0.971	1.00	870
UpStream								
DownStream	792	0.92	Level	7	0	0.966	1.00	891

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.573 using Equation (Exhibit 13-7)

V_{12} = 3744 pc/h

V_3 or V_{av34} 2144 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5888	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	5018	Exhibit 13-8	7200	No
V_R	870	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3744	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.376 (Exhibit 13-12)

S_R= 59.5 mph (Exhibit 13-12)

S_0= 72.3 mph (Exhibit 13-12)

S = 63.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	675	☑ No	☐ Off
L_{up} =	1930 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	777 veh/h	Freeway Volume, V_F	4457	V_D =	veh/h
		Ramp Volume, V_R	792		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4457	0.92	Level	7	0	0.966	1.00	5014
Ramp	792	0.92	Level	7	0	0.966	1.00	891
UpStream	777	0.92	Level	6	0	0.971	1.00	870
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1514.77 (Equation 13-6 or 13-7)

P_{FM} = 0.596 using Equation (Exhibit 13-6)

V_{12} = 2990 pc/h

V_3 or V_{av34} = 2024 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2990 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5905	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3881	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 31.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.449 (Exibit 13-11)

S_R = 57.4 mph (Exhibit 13-11)

S_0 = 64.5 mph (Exhibit 13-11)

S = 59.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 2010 ft	Acceleration Lane Length, L_A: 700	L_{down} = ft
V_u = 993 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4111	
	Ramp Volume, V_R: 660	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4111	0.92	Level	1	0	0.995	1.00	4491
Ramp	660	0.92	Level	6	0	0.971	1.00	739
UpStream	993	0.92	Level	5	0	0.976	1.00	1106
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1381.42 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 2682 pc/h

V_3 or V_{av34} = 1809 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2682 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5230	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3421	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.377 (Exibit 13-11)

S_R = 59.4 mph (Exhibit 13-11)

S_0 = 65.3 mph (Exhibit 13-11)

S = 61.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	9/6/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2016)

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2010 ft
V_u = veh/h	Deceleration Lane Length L_D: 200	V_D = 660 veh/h
	Freeway Volume, V_F: 5104	
	Ramp Volume, V_R: 993	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5104	0.92	Level	2	0	0.990	1.00	5603
Ramp	993	0.92	Level	5	0	0.976	1.00	1106
UpStream								
DownStream	660	0.92	Level	6	0	0.971	1.00	739

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.569 using Equation (Exhibit 13-7)

V_{12} = 3665 pc/h

V_3 or V_{av34} 1938 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5603	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4497	Exhibit 13-8	7200	No
V_R	1106	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3665	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.398 (Exhibit 13-12)

S_R= 58.9 mph (Exhibit 13-12)

S_0= 73.1 mph (Exhibit 13-12)

S = 63.1 mph (Exhibit 13-13)

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APPENDIX 3.7:

EXISTING (2016) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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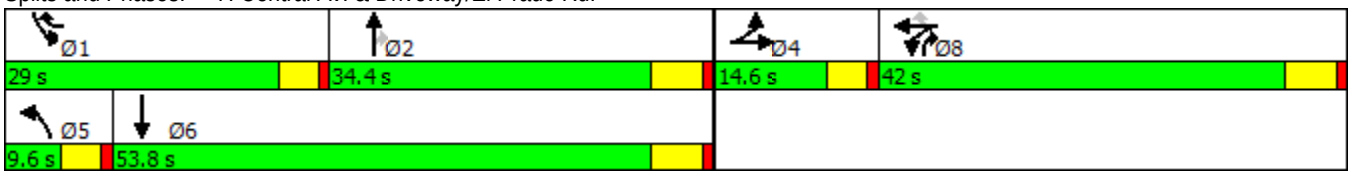
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	890	3	435	2	738	513	307	603
Future Volume (vph)	1	1	890	3	435	2	738	513	307	603
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	42.0	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	35.0%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	65.0	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.60	0.23	0.52
v/c Ratio	0.01	0.01	0.96	0.91	0.46	0.03	0.91	0.52	0.94	0.27
Control Delay	48.0	41.0	68.2	58.1	6.1	53.0	53.7	3.8	76.2	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	68.2	58.1	6.1	53.0	53.7	3.8	76.2	16.2
LOS	D	D	E	E	A	D	D	A	E	B
Approach Delay		43.3		44.5			33.2			36.2
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 38.3	Intersection LOS: D
Intersection Capacity Utilization 88.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	890	3	435	2	738	513	307	603	9
Future Volume (veh/h)	1	1	1	890	3	435	2	738	513	307	603	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	991	0	340	2	820	401	341	670	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1047	0	833	4	886	886	358	2390	29
Arrive On Green	0.01	0.01	0.01	0.32	0.00	0.32	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5006	60
Grp Volume(v), veh/h	1	0	2	991	0	340	2	820	401	341	438	240
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	32.9	0.0	14.4	0.1	25.8	16.7	22.9	8.9	8.9
Cycle Q Clear(g_c), s	0.1	0.0	0.1	32.9	0.0	14.4	0.1	25.8	16.7	22.9	8.9	8.9
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1047	0	833	4	886	886	358	1564	855
V/C Ratio(X)	0.08	0.00	0.15	0.95	0.00	0.41	0.46	0.93	0.45	0.95	0.28	0.28
Avail Cap(c_a), veh/h	147	0	150	1062	0	840	73	886	886	358	1564	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	0.0	54.4	36.4	0.0	14.7	55.0	39.8	13.1	42.4	17.4	17.4
Incr Delay (d2), s/veh	0.9	0.0	2.0	16.2	0.0	0.3	25.4	16.8	1.7	35.0	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	17.1	0.0	6.1	0.1	14.3	12.6	13.7	4.1	4.6
LnGrp Delay(d),s/veh	55.3	0.0	56.3	52.7	0.0	15.0	80.3	56.6	14.8	77.4	17.8	18.2
LnGrp LOS	E		E	D		B	F	E	B	E	B	B
Approach Vol, veh/h		3			1331			1223			1019	
Approach Delay, s/veh		56.0			43.0			42.9			37.9	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		41.5
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	24.9	27.8		2.1	2.1	10.9		34.9
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	21.3		0.8

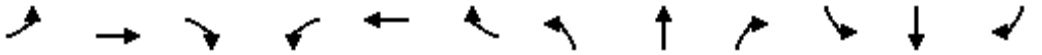
Intersection Summary	
HCM 2010 Ctrl Delay	41.5
HCM 2010 LOS	D

Notes

Lane Group	EBR	NBL
Lane Configurations		
Traffic Volume (vph)	311	812
Future Volume (vph)	311	812
Turn Type	Prot	Prot
Protected Phases	7	3
Permitted Phases		
Detector Phase	7	3
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	16.2	15.8
Total Split (s)	60.0	60.0
Total Split (%)	100.0%	100.0%
Yellow Time (s)	5.2	4.8
All-Red Time (s)	1.0	1.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.2	5.8
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)	22.9	24.9
Actuated g/C Ratio	0.92	1.00
v/c Ratio	0.23	0.54
Control Delay	0.5	1.3
Queue Delay	0.0	0.0
Total Delay	0.5	1.3
LOS	A	A
Approach Delay		
Approach LOS		

Intersection Summary		
Cycle Length: 60		
Actuated Cycle Length: 24.9		
Natural Cycle: 40		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.54		
Intersection Signal Delay: 1.1	Intersection LOS: A	
Intersection Capacity Utilization 53.6%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 54: Hellman Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	311	0	0	0	812	0	0	0	0	0
Future Volume (veh/h)	0	0	311	0	0	0	812	0	0	0	0	0
Number	7	4	14				3	8	18			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0	0	1800				1700	0	0			
Adj Flow Rate, veh/h	0	0	334				873	0	0			
Adj No. of Lanes	0	0	1				1	0	0			
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0				0	0	0			
Cap, veh/h	0	0	0				1095	0	0			
Arrive On Green	0.00	0.00	0.00				0.68	0.00	0.00			
Sat Flow, veh/h		0					1619	873				
Grp Volume(v), veh/h		0.0					873	3.4				
Grp Sat Flow(s),veh/h/ln							1619	A				
Q Serve(g_s), s							6.8					
Cycle Q Clear(g_c), s							6.8					
Prop In Lane							1.00					
Lane Grp Cap(c), veh/h							1095					
V/C Ratio(X)							0.80					
Avail Cap(c_a), veh/h							4896					
HCM Platoon Ratio							1.00					
Upstream Filter(I)							1.00					
Uniform Delay (d), s/veh							2.0					
Incr Delay (d2), s/veh							1.4					
Initial Q Delay(d3),s/veh							0.0					
%ile BackOfQ(50%),veh/ln							3.1					
LnGrp Delay(d),s/veh							3.4					
LnGrp LOS							A					
Approach Vol, veh/h												
Approach Delay, s/veh												
Approach LOS												

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3					
Phs Duration (G+Y+Rc), s			17.9					
Change Period (Y+Rc), s			5.8					
Max Green Setting (Gmax), s			54.2					
Max Q Clear Time (g_c+I1), s			8.8					
Green Ext Time (p_c), s			3.5					

Intersection Summary	
HCM 2010 Ctrl Delay	3.4
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	5	521	4	351	9	550	669	497	682
Future Volume (vph)	25	5	521	4	351	9	550	669	497	682
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.2	9.6	29.4	33.8	42.2	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.2%	8.0%	24.5%	28.2%	35.2%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.1	10.1	24.8	24.8	68.6	5.1	23.8	48.6	38.0	64.7
Actuated g/C Ratio	0.09	0.09	0.22	0.22	0.62	0.05	0.21	0.44	0.34	0.58
v/c Ratio	0.18	0.16	0.79	0.76	0.35	0.12	0.78	0.82	0.94	0.26
Control Delay	53.8	26.5	59.3	55.7	5.1	59.3	51.3	19.4	63.9	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	26.5	59.3	55.7	5.1	59.3	51.3	19.4	63.9	13.6
LOS	D	C	E	E	A	E	D	B	E	B
Approach Delay		40.2		36.5			34.0			34.5
Approach LOS		D		D			C			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 111.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 34.9 — Intersection LOS: C
Intersection Capacity Utilization 95.4% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	5	20	521	4	351	9	550	669	497	682	17
Future Volume (veh/h)	25	5	20	521	4	351	9	550	669	497	682	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	5	12	546	0	215	9	573	521	518	710	14
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	108	31	75	640	0	812	18	732	625	539	2659	52
Arrive On Green	0.07	0.07	0.07	0.20	0.00	0.20	0.01	0.21	0.21	0.33	0.54	0.54
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4959	98
Grp Volume(v), veh/h	26	0	17	546	0	215	9	573	521	518	469	255
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.7	0.0	1.1	17.9	0.0	8.5	0.6	17.4	23.6	34.6	8.5	8.6
Cycle Q Clear(g_c), s	1.7	0.0	1.1	17.9	0.0	8.5	0.6	17.4	23.6	34.6	8.5	8.6
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	108	0	106	640	0	812	18	732	625	539	1757	955
V/C Ratio(X)	0.24	0.00	0.16	0.85	0.00	0.26	0.51	0.78	0.83	0.96	0.27	0.27
Avail Cap(c_a), veh/h	147	0	145	823	0	898	73	732	625	552	1757	955
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.8	0.0	48.5	42.7	0.0	14.1	54.2	40.9	26.0	36.0	13.8	13.8
Incr Delay (d2), s/veh	0.4	0.0	0.3	7.0	0.0	0.2	8.2	8.2	12.3	28.0	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	8.7	0.0	3.6	0.3	9.0	17.9	19.6	3.9	4.4
LnGrp Delay(d),s/veh	49.2	0.0	48.8	49.6	0.0	14.3	62.4	49.0	38.4	64.0	14.2	14.5
LnGrp LOS	D		D	D		B	E	D	D	E	B	B
Approach Vol, veh/h		43			761			1103			1242	
Approach Delay, s/veh		49.1			39.7			44.1			35.0	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	41.3	29.4		11.9	5.8	64.9		27.6
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.6	23.6		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	36.6	25.6		3.7	2.6	10.6		19.9
Green Ext Time (p_c), s	0.1	0.0		0.0	0.0	21.7		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	39.5
HCM 2010 LOS	D

Notes

Lane Group	EBR	NBL
Lane Configurations		
Traffic Volume (vph)	836	277
Future Volume (vph)	836	277
Turn Type	Prot	Prot
Protected Phases	7	3
Permitted Phases		
Detector Phase	7	3
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	16.2	15.8
Total Split (s)	60.0	60.0
Total Split (%)	100.0%	100.0%
Yellow Time (s)	5.2	4.8
All-Red Time (s)	1.0	1.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.2	5.8
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)	28.6	26.1
Actuated g/C Ratio	1.00	0.91
v/c Ratio	0.58	0.20
Control Delay	1.6	0.4
Queue Delay	0.0	0.0
Total Delay	1.6	0.4
LOS	A	A
Approach Delay		
Approach LOS		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 28.6	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 1.3	Intersection LOS: A
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	836	0	0	0	277	0	0	0	0	0
Future Volume (veh/h)	0	0	836	0	0	0	277	0	0	0	0	0
Number	7	4	14				3	8	18			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0	0	1800				1700	0	0			
Adj Flow Rate, veh/h	0	0	899				298	0	0			
Adj No. of Lanes	0	0	1				1	0	0			
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0				0	0	0			
Cap, veh/h	0	0	0				845	0	0			
Arrive On Green	0.00	0.00	0.00				0.52	0.00	0.00			
Sat Flow, veh/h		0					1619	298				
Grp Volume(v), veh/h		0.0					298	1.9				
Grp Sat Flow(s),veh/h/ln							1619	A				
Q Serve(g_s), s							1.3					
Cycle Q Clear(g_c), s							1.3					
Prop In Lane							1.00					
Lane Grp Cap(c), veh/h							845					
V/C Ratio(X)							0.35					
Avail Cap(c_a), veh/h							7229					
HCM Platoon Ratio							1.00					
Upstream Filter(I)							1.00					
Uniform Delay (d), s/veh							1.7					
Incr Delay (d2), s/veh							0.3					
Initial Q Delay(d3),s/veh							0.0					
%ile BackOfQ(50%),veh/ln							0.6					
LnGrp Delay(d),s/veh							1.9					
LnGrp LOS							A					
Approach Vol, veh/h												
Approach Delay, s/veh												
Approach LOS												

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3					
Phs Duration (G+Y+Rc), s			12.1					
Change Period (Y+Rc), s			5.8					
Max Green Setting (Gmax), s			54.2					
Max Q Clear Time (g_c+I1), s			3.3					
Green Ext Time (p_c), s			0.9					

Intersection Summary	
HCM 2010 Ctrl Delay	1.9
HCM 2010 LOS	A

APPENDIX 4.1:

POST PROCESSING WORKSHEETS

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: SR-71 Southbound Ramps / Chino Hills Parkway
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
SOUTH BOUND	Left	461	628	167	36%	375	562	188	50%
	Through	82	183	102	125%	226	558	332	147%
	Right	384	339	-45	-12%	667	436	-231	-35%
	SB Total	926	1,150	224	24%	1,267	1,556	289	23%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	1,151	1,177	27	2%	1,104	638	-466	-42%
	Right	305	514	210	69%	661	630	-31	-5%
	EB Total	1,455	1,691	236	16%	1,765	1,268	-497	-28%
WEST BOUND	Left	6	15	9	150%	17	72	55	324%
	Through	917	874	-43	-5%	898	1,004	107	12%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	923	889	-34	-4%	915	1,076	162	18%
TOTAL ENTERING VOLUME		3,304	3,730	426	13%	3,947	3,900	-47	-1%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,150	1,556			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**1,150**	**1,556**	**12%**	**17%**	**9,319**
South Leg	Inbound	0	0			
South Leg	Outbound	712	1,260			
South Leg	**TOTAL**	**712**	**1,260**	**9%**	**17%**	**7,498**
East Leg	Inbound	889	1,076			
East Leg	Outbound	1,805	1,200			
East Leg	**TOTAL**	**2,694**	**2,276**	**11%**	**9%**	**24,842**
West Leg	Inbound	1,691	1,268			
West Leg	Outbound	1,213	1,440			
West Leg	**TOTAL**	**2,904**	**2,708**	**12%**	**11%**	**24,584**
OVERALL TOTAL		***7,460***	***7,800***	**11%**	***12%***	***66,243***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: SR-71 Northbound Ramps / Chino Hills Parkway
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	361	510	149	41%	338	548	210	62%
	Through	192	446	254	132%	102	275	173	170%
	Right	9	28	20	229%	5	14	9	180%
	NB Total	562	984	423	75%	445	837	392	88%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	537	474	-63	-12%	395	319	-76	-19%
	Through	1,075	1,338	264	25%	1,084	936	-148	-14%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	1,612	1,812	201	12%	1,479	1,255	-224	-15%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	562	400	-162	-29%	577	452	-125	-22%
	Right	296	345	50	17%	510	666	156	31%
	WB Total	858	745	-113	-13%	1,087	1,118	32	3%
TOTAL ENTERING VOLUME		3,031	3,541	510.5	17%	3,010	3,210	200	7%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	1,265	1,260			
North Leg	**TOTAL**	**1,265**	**1,260**	**16%**	**16%**	**7,978**
South Leg	Inbound	984	837			
South Leg	Outbound	0	0			
South Leg	**TOTAL**	**984**	**837**	**12%**	**10%**	**7,998**
East Leg	Inbound	745	1,118			
East Leg	Outbound	1,366	950			
East Leg	**TOTAL**	**2,111**	**2,068**	**9%**	**9%**	**24,277**
West Leg	Inbound	1,812	1,255			
West Leg	Outbound	910	1,000			
West Leg	**TOTAL**	**2,722**	**2,255**	**11%**	**9%**	**24,842**
OVERALL TOTAL		***7,082***	***6,420***	**11%**	***10%***	***65,095***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Ramona Avenue / Chino Hills Parkway
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	26	28	2	8%	21	29	8	38%
	Through	384	459	76	20%	284	468	185	65%
	Right	144	207	63	44%	134	216	83	62%
	NB Total	554	694	141	25%	438	713	275	63%
SOUTH BOUND	Left	76	86	10	13%	150	150	1	0%
	Through	174	369	196	113%	445	435	-10	-2%
	Right	241	203	-38	-16%	400	347	-53	-13%
	SB Total	490	658	168	34%	995	932	-63	-6%
EAST BOUND	Left	340	373	33	10%	246	219	-27	-11%
	Through	740	977	238	32%	841	734	-107	-13%
	Right	4	9	6	157%	2	2	0	0%
	EB Total	1,083	1,359	276	25%	1,089	955	-134	-12%
WEST BOUND	Left	65	142	78	120%	137	163	26	19%
	Through	591	519	-72	-12%	666	704	39	6%
	Right	90	87	-3	-3%	124	154	31	25%
	WB Total	746	748	3	0%	926	1,021	95	10%
TOTAL ENTERING VOLUME		2,872	3,459	587	20%	3,448	3,621	174	5%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	658	932			
North Leg	Outbound	919	841			
North Leg	**TOTAL**	**1,577**	**1,773**	**10%**	**12%**	**15,062**
South Leg	Inbound	694	713			
South Leg	Outbound	520	600			
South Leg	**TOTAL**	**1,214**	**1,313**	**8%**	**9%**	**14,699**
East Leg	Inbound	748	1,021			
East Leg	Outbound	1,270	1,100			
East Leg	**TOTAL**	**2,018**	**2,121**	**8%**	**8%**	**25,694**
West Leg	Inbound	1,359	955			
West Leg	Outbound	750	1,080			
West Leg	**TOTAL**	**2,109**	**2,035**	**9%**	**8%**	**24,277**
OVERALL TOTAL		***6,918***	***7,242***	**9%**	***9%***	***79,732***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Monte Vista Avenue - West / Chino Hills Parkway
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	105	109	5	4%	87	166	80	92%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	31	40	10	31%	27	45	18	67%
	NB Total	135	149	14	10%	114	211	98	86%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	751	1,000	250	33%	828	822	-6	-1%
	Right	93	166	73	78%	120	123	4	3%
	EB Total	844	1,166	323	38%	947	945	-2	0%
WEST BOUND	Left	27	44	18	66%	45	41	-4	-8%
	Through	630	621	-9	-1%	762	774	13	2%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	656	665	9	1%	806	815	9	1%
TOTAL ENTERING VOLUME		1,635	1,980	345.5	21%	1,867	1,971	105	6%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	149	211			
South Leg	Outbound	210	164			
South Leg	**TOTAL**	**359**	**375**	**10%**	**11%**	**3,459**
East Leg	Inbound	665	815			
East Leg	Outbound	1,040	867			
East Leg	**TOTAL**	**1,705**	**1,682**	**7%**	**7%**	**23,396**
West Leg	Inbound	1,166	945			
West Leg	Outbound	730	940			
West Leg	**TOTAL**	**1,896**	**1,885**	**8%**	**8%**	**24,213**
OVERALL TOTAL		***3,960***	***3,942***	**8%**	***8%***	***51,068***

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Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: Monte Vista Avenue - East / Chino Hills Parkway
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
SOUTH BOUND	Left	64	100	37	57%	58	107	49	84%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	94	60	-34	-36%	232	237	5	2%
	SB Total	158	160	3	2%	290	344	54	19%
EAST BOUND	Left	212	264	52	25%	119	213	94	79%
	Through	569	798	229	40%	736	683	-53	-7%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	781	1,062	281	36%	855	896	42	5%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	562	625	63	11%	574	573	-1	0%
	Right	30	73	44	147%	60	207	147	245%
	WB Total	592	698	107	18%	634	780	146	23%
TOTAL ENTERING VOLUME		1,530	1,920	390	25%	1,779	2,020	242	14%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	160	344			
North Leg	Outbound	337	420			
North Leg	**TOTAL**	**497**	**764**	**7%**	**11%**	**6,712**
South Leg	Inbound	0	0			
South Leg	Outbound	0	0			
South Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
East Leg	Inbound	698	780			
East Leg	Outbound	898	790			
East Leg	**TOTAL**	**1,596**	**1,570**	**8%**	**7%**	**20,966**
West Leg	Inbound	1,062	896			
West Leg	Outbound	685	810			
West Leg	**TOTAL**	**1,747**	**1,706**	**7%**	**7%**	**23,396**
OVERALL TOTAL		***3,840***	***4,040***	**8%**	***8%***	***51,074***

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Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: Central Avenue / Chino Hills Parkway
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	314	309	-5	-1%	231	249	19	8%
	Through	790	908	119	15%	702	1,262	560	80%
	Right	43	71	28	65%	1	12	11	1100%
	NB Total	1,146	1,288	142	12%	934	1,523	590	63%
SOUTH BOUND	Left	62	122	60	97%	10	122	112	1120%
	Through	639	706	67	10%	803	882	80	10%
	Right	245	288	44	18%	222	250	28	13%
	SB Total	946	1,116	171	18%	1,035	1,254	220	21%
EAST BOUND	Left	295	439	145	49%	475	593	119	25%
	Through	50	107	57	114%	2	16	14	700%
	Right	191	229	38	20%	356	261	-95	-27%
	EB Total	536	775	240	45%	833	870	38	5%
WEST BOUND	Left	2	14	12	600%	11	27	16	145%
	Through	3	23	20	667%	40	101	61	153%
	Right	7	63	56	800%	32	134	102	319%
	WB Total	12	100	88	733%	83	262	179	216%
TOTAL ENTERING VOLUME		2,639	3,279	640	24%	2,884	3,909	1026	36%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,116	1,254			
North Leg	Outbound	1,410	1,989			
North Leg	**TOTAL**	**2,526**	**3,243**	**8%**	**10%**	**32,084**
South Leg	Inbound	1,288	1,523			
South Leg	Outbound	949	1,170			
South Leg	**TOTAL**	**2,237**	**2,693**	**7%**	**9%**	**29,966**
East Leg	Inbound	100	262			
East Leg	Outbound	300	150			
East Leg	**TOTAL**	**400**	**412**	**#DIV/0!**	**#DIV/0!**	**-**
West Leg	Inbound	775	870			
West Leg	Outbound	620	600			
West Leg	**TOTAL**	**1,395**	**1,470**	**7%**	**8%**	**18,629**
OVERALL TOTAL		***6,558***	***7,818***	**8%**	***10%***	***80,679***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[06 Central_Chino Hills.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Central Avenue / El Prado Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	4	666	662	16550%	4	1,022	1,018	25450%
	Right	2	403	401	20050%	2	597	595	29750%
	NB Total	7	1,069	1,062	15171%	7	1,619	1,612	23029%
SOUTH BOUND	Left	2	267	265	13250%	2	393	391	19550%
	Through	4	794	790	19750%	4	1,018	1,014	25350%
	Right	1	0	-1	-100%	1	0	-1	-100%
	SB Total	7	1,061	1,054	15057%	7	1,411	1,404	20057%
EAST BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	1	0	-1	-100%	1	0	-1	-100%
	EB Total	3	0	-3	-100%	3	0	-3	-100%
WEST BOUND	Left	2	386	384	19200%	2	602	600	30000%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	2	214	212	10600%	2	398	396	19800%
	WB Total	5	600	595	11900%	5	1,000	995	19900%
TOTAL ENTERING VOLUME		22	2,730	2708	12309%	22	4,030	4008	18218%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,061	1,411			
North Leg	Outbound	880	1,420			
North Leg	**TOTAL**	**1,941**	**2,831**	**7%**	**10%**	**29,780**
South Leg	Inbound	1,069	1,619			
South Leg	Outbound	1,180	1,620			
South Leg	**TOTAL**	**2,249**	**3,239**	**7%**	**10%**	**31,991**
East Leg	Inbound	600	1,000			
East Leg	Outbound	670	990			
East Leg	**TOTAL**	**1,270**	**1,990**	**7%**	**11%**	**18,840**
West Leg	Inbound	0	0			
West Leg	Outbound	0	0			
West Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
OVERALL TOTAL		***5,460***	***8,060***	***7%***	***10%***	***80,611***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[07 Central_El Prado-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: SR-71 Northbound Ramps / Central Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	84	83	8300%	1	122	121	12100%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	405	404	40400%	1	661	660	66000%
	NB Total	2	489	487	24350%	2	783	781	39050%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	715	713	35650%	2	1,009	1,007	50350%
	Right	1	300	299	29900%	1	390	389	38900%
	EB Total	3	1,015	1,012	33733%	3	1,399	1,396	46533%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	746	744	37200%	2	948	946	47300%
	Right	1	420	419	41900%	1	640	639	63900%
	WB Total	3	1,166	1,163	38767%	3	1,588	1,585	52833%
TOTAL ENTERING VOLUME		8	2,670	2662	33275%	8	3,770	3762	47025%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	420	640			
North Leg	**TOTAL**	**420**	**640**	**7%**	**11%**	**5,952**
South Leg	Inbound	489	783			
South Leg	Outbound	300	390			
South Leg	**TOTAL**	**789**	**1,173**	**7%**	**10%**	**11,467**
East Leg	Inbound	1,166	1,588			
East Leg	Outbound	1,120	1,670			
East Leg	**TOTAL**	**2,286**	**3,258**	**7%**	**10%**	**33,510**
West Leg	Inbound	1,015	1,399			
West Leg	Outbound	830	1,070			
West Leg	**TOTAL**	**1,845**	**2,469**	**8%**	**11%**	**23,438**
OVERALL TOTAL		***5,340***	***7,540***	**7%**	***10%***	***74,367***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[08 SR-71NB_Central-SEMI.xls]Output (3)

Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: SR-71 Southbound Ramps / Central Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
SOUTH BOUND	Left	1	323	322	32200%	1	473	472	47200%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	253	252	25200%	1	246	245	24500%
	SB Total	2	576	574	28700%	2	719	717	35850%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	627	625	31250%	2	847	845	42250%
	Right	1	10	9	900%	1	0	-1	-100%
	EB Total	3	637	634	21133%	3	847	844	28133%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	327	325	16250%	2	489	487	24350%
	Right	1	520	519	51900%	1	584	583	58300%
	WB Total	3	847	844	28133%	3	1,073	1,070	35667%
TOTAL ENTERING VOLUME		8	2,060	2052	25650%	8	2,639	2631	32888%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	576	719			
North Leg	Outbound	520	584			
North Leg	**TOTAL**	**1,096**	**1,303**	**8%**	**10%**	**13,340**
South Leg	Inbound	0	0			
South Leg	Outbound	10	0			
South Leg	**TOTAL**	**10**	**0**	**2%**	**0%**	**414**
East Leg	Inbound	847	1,073			
East Leg	Outbound	950	1,320			
East Leg	**TOTAL**	**1,797**	**2,393**	**8%**	**10%**	**23,438**
West Leg	Inbound	637	847			
West Leg	Outbound	580	735			
West Leg	**TOTAL**	**1,217**	**1,582**	**7%**	**10%**	**16,383**
OVERALL TOTAL		***4,120***	***5,278***	**8%**	***10%***	***53,575***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[09 SR-71SB_Central-SEMI.xls]Output (3)

Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: El Prado Avenue / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	4	35	31	775%	4	76	72	1800%
	Right	2	56	54	2700%	2	105	103	5150%
	NB Total	7	91	84	1200%	7	181	174	2486%
SOUTH BOUND	Left	2	534	532	26600%	2	895	893	44650%
	Through	4	59	55	1375%	4	54	50	1250%
	Right	1	0	-1	-100%	1	0	-1	-100%
	SB Total	7	593	586	8371%	7	949	942	13457%
EAST BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	1	0	-1	-100%	1	0	-1	-100%
	EB Total	3	0	-3	-100%	3	0	-3	-100%
WEST BOUND	Left	2	91	89	4450%	2	66	64	3200%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	2	515	513	25650%	2	794	792	39600%
	WB Total	5	606	601	12020%	5	860	855	17100%
TOTAL ENTERING VOLUME		22	1,290	1268	5764%	22	1,990	1968	8945%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	593	949			
North Leg	Outbound	550	870			
North Leg	**TOTAL**	**1,143**	**1,819**	**7%**	**11%**	**16,832**
South Leg	Inbound	91	181			
South Leg	Outbound	150	120			
South Leg	**TOTAL**	**241**	**301**	**8%**	**10%**	**2,965**
East Leg	Inbound	606	860			
East Leg	Outbound	590	1,000			
East Leg	**TOTAL**	**1,196**	**1,860**	**7%**	**10%**	**17,834**
West Leg	Inbound	0	0			
West Leg	Outbound	0	0			
West Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
OVERALL TOTAL		***2,580***	***3,980***	***7%***	***11%***	***37,631***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[10 El Prado_Kimball-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Mountain Avenue / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	39	38	3800%	1	56	55	5500%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	72	71	7100%	1	116	115	11500%
	NB Total	2	111	109	5450%	2	172	170	8500%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	4	552	548	13700%	4	974	970	24250%
	Right	1	50	49	4900%	1	46	45	4500%
	EB Total	5	602	597	11940%	5	1,020	1,015	20300%
WEST BOUND	Left	1	101	100	10000%	1	84	83	8300%
	Through	4	596	592	14800%	4	844	840	21000%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	5	697	692	13840%	5	928	923	18460%
TOTAL ENTERING VOLUME		12	1,410	1398	11650%	12	2,120	2108	17567%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	111	172			
South Leg	Outbound	151	130			
South Leg	**TOTAL**	**262**	**302**	**7%**	**8%**	**3,646**
East Leg	Inbound	697	928			
East Leg	Outbound	624	1,090			
East Leg	**TOTAL**	**1,321**	**2,018**	**7%**	**10%**	**19,297**
West Leg	Inbound	602	1,020			
West Leg	Outbound	635	900			
West Leg	**TOTAL**	**1,237**	**1,920**	**7%**	**11%**	**17,834**
OVERALL TOTAL		***2,820***	***4,240***	***7%***	***10%***	***40,777***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[11 Mountain_Kimball-SEMI.xls]Output (3)

Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: San Antonio Avenue / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	24	23	2300%	1	77	76	7600%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	7	6	600%	1	36	35	3500%
	NB Total	2	31	29	1450%	2	113	111	5550%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	4	523	519	12975%	4	1,014	1,010	25250%
	Right	1	65	64	6400%	1	36	35	3500%
	EB Total	5	588	583	11660%	5	1,050	1,045	20900%
WEST BOUND	Left	1	25	24	2400%	1	14	13	1300%
	Through	4	686	682	17050%	4	873	869	21725%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	5	711	706	14120%	5	887	882	17640%
TOTAL ENTERING VOLUME		12	1,330	1318	10983%	12	2,050	2038	16983%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	31	113			
South Leg	Outbound	90	50			
South Leg	**TOTAL**	**121**	**163**	**8%**	**10%**	**1,572**
East Leg	Inbound	711	887			
East Leg	Outbound	530	1,050			
East Leg	**TOTAL**	**1,241**	**1,937**	**7%**	**11%**	**17,725**
West Leg	Inbound	588	1,050			
West Leg	Outbound	710	950			
West Leg	**TOTAL**	**1,298**	**2,000**	**7%**	**10%**	**19,297**
OVERALL TOTAL		***2,660***	***4,100***	***7%***	***11%***	***38,594***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[12 San Antonio_Kimball-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / SR-60 Westbound Ramps
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	292	532	240	82%	226	345	120	53%
	Through	896	1,469	573	64%	976	1,629	653	67%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	1,188	2,001	813	68%	1,202	1,974	773	64%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	958	1,424	466	49%	856	1,346	491	57%
	Right	461	796	335	73%	518	807	290	56%
	SB Total	1,419	2,220	801	56%	1,373	2,153	780	57%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
WEST BOUND	Left	584	616	33	6%	526	734	209	40%
	Through	2	2	0	0%	6	8	3	45%
	Right	364	401	38	10%	398	601	203	51%
	WB Total	949	1,019	70	7%	929	1,343	414	45%
TOTAL ENTERING VOLUME		3,556	5,240	1684	47%	3,504	5,470	1967	56%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	2,220	2,153			
North Leg	Outbound	1,870	2,230			
North Leg	**TOTAL**	**4,090**	**4,383**	**8%**	**8%**	**53,286**
South Leg	Inbound	2,001	1,974			
South Leg	Outbound	2,040	2,080			
South Leg	**TOTAL**	**4,041**	**4,054**	**8%**	**8%**	**53,444**
East Leg	Inbound	1,019	1,343			
East Leg	Outbound	0	0			
East Leg	**TOTAL**	**1,019**	**1,343**	**9%**	**12%**	**11,615**
West Leg	Inbound	0	0			
West Leg	Outbound	1,330	1,160			
West Leg	**TOTAL**	**1,330**	**1,160**	**9%**	**8%**	**14,808**
OVERALL TOTAL		***10,480***	***10,940***	**8%**	***8%***	***133,153***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[14 Euclid_SR60WB.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / SR-60 Eastbound Ramps
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	864	1,577	713	83%	832	1,378	546	66%
	Right	537	767	230	43%	556	511	-45	-8%
	NB Total	1,401	2,344	943	67%	1,388	1,889	501	36%
SOUTH BOUND	Left	287	313	26	9%	295	277	-18	-6%
	Through	1,255	1,732	478	38%	1,086	1,804	718	66%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	1,542	2,045	504	33%	1,381	2,081	700	51%
EAST BOUND	Left	324	423	99	31%	370	592	223	60%
	Through	0	0	0	#DIV/0!	2	2	0	0%
	Right	309	398	90	29%	322	506	185	57%
	EB Total	633	821	189	30%	693	1,100	407	59%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		3,575	5,210	1635	46%	3,462	5,070	1608	46%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	2,045	2,081			
North Leg	Outbound	2,000	1,970			
North Leg	**TOTAL**	**4,045**	**4,051**	**8%**	**8%**	**53,444**
South Leg	Inbound	2,344	1,889			
South Leg	Outbound	2,130	2,310			
South Leg	**TOTAL**	**4,474**	**4,199**	**8%**	**8%**	**55,458**
East Leg	Inbound	0	0			
East Leg	Outbound	1,080	790			
East Leg	**TOTAL**	**1,080**	**790**	**13%**	**9%**	**8,477**
West Leg	Inbound	821	1,100			
West Leg	Outbound	0	0			
West Leg	**TOTAL**	**821**	**1,100**	**6%**	**7%**	**14,837**
OVERALL TOTAL		***10,420***	***10,140***	**8%**	***8%***	***132,216***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[15 Euclid_SR60EB.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Walnut Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	101	125	24	24%	120	178	59	49%
	Through	1,067	1,818	752	70%	1,073	1,521	449	42%
	Right	48	42	-6	-12%	56	47	-9	-15%
	NB Total	1,215	1,985	770	63%	1,248	1,746	499	40%
SOUTH BOUND	Left	154	135	-19	-12%	312	300	-12	-4%
	Through	1,139	1,710	571	50%	956	1,799	844	88%
	Right	56	68	12	21%	132	225	93	70%
	SB Total	1,349	1,913	564	42%	1,400	2,324	925	66%
EAST BOUND	Left	147	297	151	103%	119	158	40	33%
	Through	326	345	20	6%	308	244	-64	-21%
	Right	98	177	80	82%	126	194	69	55%
	EB Total	570	819	250	44%	552	596	44	8%
WEST BOUND	Left	79	90	11	14%	89	117	28	31%
	Through	301	278	-23	-8%	268	317	50	19%
	Right	168	213	45	27%	117	132	15	13%
	WB Total	548	581	33	6%	474	566	93	20%
TOTAL ENTERING VOLUME		3,682	5,298	1616.5	44%	3,673	5,232	1560	42%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,913	2,324			
North Leg	Outbound	2,328	1,811			
North Leg	**TOTAL**	**4,241**	**4,135**	**8%**	**7%**	**55,458**
South Leg	Inbound	1,985	1,746			
South Leg	Outbound	1,977	2,110			
South Leg	**TOTAL**	**3,962**	**3,856**	**8%**	**8%**	**50,051**
East Leg	Inbound	581	566			
East Leg	Outbound	522	591			
East Leg	**TOTAL**	**1,103**	**1,157**	**9%**	**9%**	**12,663**
West Leg	Inbound	819	596			
West Leg	Outbound	471	720			
West Leg	**TOTAL**	**1,290**	**1,316**	**13%**	**13%**	**10,266**
OVERALL TOTAL		***10,596***	***10,464***	**8%**	***8%***	***128,438***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[16 Euclid_Walnut.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Riverside Drive
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	61	152	91	149%	69	297	228	330%
	Through	927	1,570	644	69%	946	1,534	588	62%
	Right	165	336	172	104%	259	605	347	134%
	NB Total	1,152	2,058	906	79%	1,274	2,436	1,163	91%
SOUTH BOUND	Left	175	128	-47	-27%	125	97	-28	-22%
	Through	1,003	1,753	750	75%	795	1,737	943	119%
	Right	145	129	-16	-11%	159	227	69	43%
	SB Total	1,323	2,010	688	52%	1,078	2,061	984	91%
EAST BOUND	Left	139	182	43	31%	144	107	-37	-25%
	Through	318	501	184	58%	369	398	30	8%
	Right	51	191	141	278%	60	180	121	203%
	EB Total	507	874	367	72%	572	685	114	20%
WEST BOUND	Left	169	268	100	59%	165	233	69	42%
	Through	373	303	-70	-19%	331	307	-24	-7%
	Right	49	27	-22	-45%	53	18	-35	-66%
	WB Total	591	598	8	1%	548	558	11	2%
TOTAL ENTERING VOLUME		3,572	5,540	1968	55%	3,470	5,740	2270	65%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	2,010	2,061			
North Leg	Outbound	1,779	1,659			
North Leg	**TOTAL**	**3,789**	**3,720**	**8%**	**8%**	**49,108**
South Leg	Inbound	2,058	2,436			
South Leg	Outbound	2,212	2,150			
South Leg	**TOTAL**	**4,270**	**4,586**	**7%**	**7%**	**64,019**
East Leg	Inbound	598	558			
East Leg	Outbound	965	1,100			
East Leg	**TOTAL**	**1,563**	**1,658**	**8%**	**9%**	**18,537**
West Leg	Inbound	874	685			
West Leg	Outbound	584	831			
West Leg	**TOTAL**	**1,458**	**1,516**	**8%**	**8%**	**18,481**
OVERALL TOTAL		***11,080***	***11,480***	***7%***	***8%***	***150,145***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[17 Euclid_Riverside.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Chino Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	55	37	-18	-33%	45	53	9	19%
	Through	997	1,761	764	77%	1,226	2,382	1,156	94%
	Right	131	208	77	59%	200	431	232	116%
	NB Total	1,183	2,006	823	70%	1,470	2,866	1,396	95%
SOUTH BOUND	Left	28	58	30	107%	15	50	36	245%
	Through	1,090	2,061	972	89%	899	1,891	993	110%
	Right	95	83	-12	-12%	60	115	55	92%
	SB Total	1,212	2,202	990	82%	973	2,056	1,083	111%
EAST BOUND	Left	97	212	115	119%	67	79	13	19%
	Through	119	233	115	97%	166	219	53	32%
	Right	46	82	36	78%	32	26	-6	-17%
	EB Total	262	527	266	102%	264	324	60	23%
WEST BOUND	Left	59	147	88	149%	68	164	96	141%
	Through	155	180	25	16%	93	202	110	118%
	Right	35	107	72	206%	23	79	57	251%
	WB Total	249	434	185	74%	183	445	262	143%
TOTAL ENTERING VOLUME		2,906	5,169	2263.5	78%	2,890	5,691	2801	97%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	2,202	2,056			
North Leg	Outbound	2,080	2,540			
North Leg	**TOTAL**	**4,282**	**4,596**	**7%**	**7%**	**63,436**
South Leg	Inbound	2,006	2,866			
South Leg	Outbound	2,290	2,081			
South Leg	**TOTAL**	**4,296**	**4,947**	**7%**	**8%**	**63,924**
East Leg	Inbound	434	445			
East Leg	Outbound	499	700			
East Leg	**TOTAL**	**933**	**1,145**	**7%**	**8%**	**14,199**
West Leg	Inbound	527	324			
West Leg	Outbound	300	370			
West Leg	**TOTAL**	**827**	**694**	**8%**	**7%**	**9,858**
OVERALL TOTAL		***10,338***	***11,382***	**7%**	***8%***	***151,417***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[18 Euclid_Chino.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Schaefer Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	146	145	14500%	1	214	213	21300%
	Through	4	1,400	1,396	34900%	4	2,357	2,353	58825%
	Right	1	26	25	2500%	1	72	71	7100%
	NB Total	6	1,572	1,566	26100%	6	2,643	2,637	43950%
SOUTH BOUND	Left	1	40	39	3900%	1	122	121	12100%
	Through	4	2,180	2,176	54400%	4	2,079	2,075	51875%
	Right	1	227	226	22600%	1	364	363	36300%
	SB Total	6	2,447	2,441	40683%	6	2,565	2,559	42650%
EAST BOUND	Left	1	148	147	14700%	1	459	458	45800%
	Through	2	24	22	1100%	2	126	124	6200%
	Right	1	148	147	14700%	1	237	236	23600%
	EB Total	4	320	316	7900%	4	822	818	20450%
WEST BOUND	Left	1	72	71	7100%	1	33	32	3200%
	Through	2	67	65	3250%	2	52	50	2500%
	Right	1	72	71	7100%	1	64	63	6300%
	WB Total	4	211	207	5175%	4	149	145	3625%
TOTAL ENTERING VOLUME		20	4,550	4530	22650%	20	6,179	6159	30795%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	2,447	2,565			
North Leg	Outbound	1,620	2,880			
North Leg	**TOTAL**	**4,067**	**5,445**	**6%**	**9%**	**63,312**
South Leg	Inbound	1,572	2,643			
South Leg	Outbound	2,400	2,349			
South Leg	**TOTAL**	**3,972**	**4,992**	**7%**	**8%**	**60,428**
East Leg	Inbound	211	149			
East Leg	Outbound	90	320			
East Leg	**TOTAL**	**301**	**469**	**7%**	**10%**	**4,541**
West Leg	Inbound	320	822			
West Leg	Outbound	440	630			
West Leg	**TOTAL**	**760**	**1,452**	**6%**	**12%**	**11,841**
OVERALL TOTAL		***9,100***	***12,358***	**6%**	***9%***	***140,122***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[19 Euclid_Schaefer-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Edison Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	182	48	-134	-74%	89	38	-51	-57%
	Through	893	1,146	254	28%	911	1,752	842	92%
	Right	33	80	47	142%	70	225	156	224%
	NB Total	1,108	1,274	167	15%	1,069	2,015	947	89%
SOUTH BOUND	Left	39	363	324	831%	66	536	471	718%
	Through	841	1,861	1,020	121%	817	1,502	685	84%
	Right	237	239	2	1%	163	175	13	8%
	SB Total	1,117	2,463	1,346	121%	1,045	2,213	1,168	112%
EAST BOUND	Left	206	401	196	95%	330	465	136	41%
	Through	158	579	422	268%	452	1,072	621	137%
	Right	143	125	-18	-12%	198	105	-93	-47%
	EB Total	506	1,105	600	119%	979	1,642	664	68%
WEST BOUND	Left	61	268	207	339%	25	165	140	560%
	Through	328	655	327	100%	132	509	378	287%
	Right	38	367	330	879%	29	507	478	1648%
	WB Total	427	1,290	864	202%	186	1,181	996	537%
TOTAL ENTERING VOLUME		3,157	6,132	2975.5	94%	3,278	7,051	3774	115%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	2,463	2,213			
North Leg	Outbound	1,914	2,724			
North Leg	**TOTAL**	**4,377**	**4,937**	**7%**	**8%**	**59,494**
South Leg	Inbound	1,274	2,015			
South Leg	Outbound	2,254	1,772			
South Leg	**TOTAL**	**3,528**	**3,787**	**7%**	**8%**	**49,908**
East Leg	Inbound	1,290	1,181			
East Leg	Outbound	1,022	1,833			
East Leg	**TOTAL**	**2,312**	**3,014**	**6%**	**8%**	**35,993**
West Leg	Inbound	1,105	1,642			
West Leg	Outbound	942	722			
West Leg	**TOTAL**	**2,047**	**2,364**	**7%**	**8%**	**29,810**
OVERALL TOTAL		***12,264***	***14,102***	**7%**	***8%***	***175,205***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[20 Euclid_Edison.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Eucalyptus Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	64	63	6300%	1	52	51	5100%
	Through	4	1,074	1,070	26750%	4	2,088	2,084	52100%
	Right	1	30	29	2900%	1	90	89	8900%
	NB Total	6	1,168	1,162	19367%	6	2,230	2,224	37067%
SOUTH BOUND	Left	1	41	40	4000%	1	119	118	11800%
	Through	4	1,992	1,988	49700%	4	1,842	1,838	45950%
	Right	1	88	87	8700%	1	68	67	6700%
	SB Total	6	2,121	2,115	35250%	6	2,029	2,023	33717%
EAST BOUND	Left	1	34	33	3300%	1	107	106	10600%
	Through	1	9	8	800%	1	42	41	4100%
	Right	1	47	46	4600%	1	72	71	7100%
	EB Total	3	90	87	2900%	3	221	218	7267%
WEST BOUND	Left	1	71	70	7000%	1	60	59	5900%
	Through	1	28	27	2700%	1	20	19	1900%
	Right	1	52	51	5100%	1	90	89	8900%
	WB Total	3	151	148	4933%	3	170	167	5567%
TOTAL ENTERING VOLUME		18	3,530	3512	19511%	18	4,650	4632	25733%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	2,121	2,029			
North Leg	Outbound	1,160	2,285			
North Leg	**TOTAL**	**3,281**	**4,314**	**7%**	**9%**	**49,908**
South Leg	Inbound	1,168	2,230			
South Leg	Outbound	2,110	1,974			
South Leg	**TOTAL**	**3,278**	**4,204**	**7%**	**9%**	**49,410**
East Leg	Inbound	151	170			
East Leg	Outbound	80	251			
East Leg	**TOTAL**	**231**	**421**	**8%**	**14%**	**2,907**
West Leg	Inbound	90	221			
West Leg	Outbound	180	140			
West Leg	**TOTAL**	**270**	**361**	**7%**	**9%**	**4,124**
OVERALL TOTAL		***7,060***	***9,300***	***7%***	***9%***	***106,349***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[21 Euclid_Eucalyptus-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Merrill Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	5	1,093	1,088	21760%	5	1,985	1,980	39600%
	Right	2	83	81	4050%	2	129	127	6350%
	NB Total	8	1,176	1,168	14600%	8	2,114	2,106	26325%
SOUTH BOUND	Left	2	77	75	3750%	2	151	149	7450%
	Through	5	2,037	2,032	40640%	5	1,814	1,809	36180%
	Right	1	0	-1	-100%	1	0	-1	-100%
	SB Total	8	2,114	2,106	26325%	8	1,965	1,957	24463%
EAST BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	1	0	-1	-100%	1	0	-1	-100%
	EB Total	3	0	-3	-100%	3	0	-3	-100%
WEST BOUND	Left	2	113	111	5550%	2	176	174	8700%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	2	57	55	2750%	2	225	223	11150%
	WB Total	5	170	165	3300%	5	401	396	7920%
TOTAL ENTERING VOLUME		24	3,460	3436	14317%	24	4,480	4456	18567%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	2,114	1,965			
North Leg	Outbound	1,150	2,210			
North Leg	**TOTAL**	**3,264**	**4,175**	**7%**	**8%**	**49,410**
South Leg	Inbound	1,176	2,114			
South Leg	Outbound	2,150	1,990			
South Leg	**TOTAL**	**3,326**	**4,104**	**7%**	**8%**	**49,387**
East Leg	Inbound	170	401			
East Leg	Outbound	160	280			
East Leg	**TOTAL**	**330**	**681**	**6%**	**13%**	**5,269**
West Leg	Inbound	0	0			
West Leg	Outbound	0	0			
West Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
OVERALL TOTAL		***6,920***	***8,960***	***7%***	***9%***	***104,066***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[22 Euclid_Merrill-SEMI.xls]Output (3)

Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: Euclid Avenue (SR-83) / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	124	123	12300%	1	195	194	19400%
	Through	5	746	741	14820%	5	1,317	1,312	26240%
	Right	1	152	151	15100%	1	282	281	28100%
	NB Total	7	1,022	1,015	14500%	7	1,794	1,787	25529%
SOUTH BOUND	Left	1	260	259	25900%	1	325	324	32400%
	Through	5	1,466	1,461	29220%	5	1,272	1,267	25340%
	Right	1	212	211	21100%	1	226	225	22500%
	SB Total	7	1,938	1,931	27586%	7	1,823	1,816	25943%
EAST BOUND	Left	1	131	130	13000%	1	277	276	27600%
	Through	2	239	237	11850%	2	533	531	26550%
	Right	1	150	149	14900%	1	232	231	23100%
	EB Total	4	520	516	12900%	4	1,042	1,038	25950%
WEST BOUND	Left	1	259	258	25800%	1	256	255	25500%
	Through	2	336	334	16700%	2	409	407	20350%
	Right	1	225	224	22400%	1	306	305	30500%
	WB Total	4	820	816	20400%	4	971	967	24175%
TOTAL ENTERING VOLUME		22	4,300	4278	19445%	22	5,630	5608	25491%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,938	1,823			
North Leg	Outbound	1,102	1,900			
North Leg	**TOTAL**	**3,040**	**3,723**	**7%**	**8%**	**45,944**
South Leg	Inbound	1,022	1,794			
South Leg	Outbound	1,875	1,760			
South Leg	**TOTAL**	**2,897**	**3,554**	**7%**	**8%**	**44,081**
East Leg	Inbound	820	971			
East Leg	Outbound	651	1,140			
East Leg	**TOTAL**	**1,471**	**2,111**	**7%**	**10%**	**22,072**
West Leg	Inbound	520	1,042			
West Leg	Outbound	672	830			
West Leg	**TOTAL**	**1,192**	**1,872**	**7%**	**11%**	**17,725**
OVERALL TOTAL		***8,600***	***11,260***	***7%***	***9%***	***129,822***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Bickmore Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	48	47	4700%	1	15	14	1400%
	Through	5	931	926	18520%	5	1,429	1,424	28480%
	Right	1	41	40	4000%	1	52	51	5100%
	NB Total	7	1,020	1,013	14471%	7	1,496	1,489	21271%
SOUTH BOUND	Left	1	98	97	9700%	1	161	160	16000%
	Through	5	1,616	1,611	32220%	5	1,499	1,494	29880%
	Right	1	115	114	11400%	1	47	46	4600%
	SB Total	7	1,829	1,822	26029%	7	1,707	1,700	24286%
EAST BOUND	Left	1	29	28	2800%	1	175	174	17400%
	Through	1	11	10	1000%	1	58	57	5700%
	Right	1	21	20	2000%	1	60	59	5900%
	EB Total	3	61	58	1933%	3	293	290	9667%
WEST BOUND	Left	1	43	42	4200%	1	65	64	6400%
	Through	1	28	27	2700%	1	18	17	1700%
	Right	1	60	59	5900%	1	190	189	18900%
	WB Total	3	131	128	4267%	3	273	270	9000%
TOTAL ENTERING VOLUME		20	3,041	3021	15105%	20	3,769	3749	18745%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,829	1,707			
North Leg	Outbound	1,020	1,794			
North Leg	**TOTAL**	**2,849**	**3,501**	**6%**	**8%**	**44,081**
South Leg	Inbound	1,020	1,496			
South Leg	Outbound	1,680	1,624			
South Leg	**TOTAL**	**2,700**	**3,120**	**7%**	**8%**	**38,999**
East Leg	Inbound	131	273			
East Leg	Outbound	150	271			
East Leg	**TOTAL**	**281**	**544**	**5%**	**9%**	**6,173**
West Leg	Inbound	61	293			
West Leg	Outbound	191	80			
West Leg	**TOTAL**	**252**	**373**	**7%**	**10%**	**3,568**
OVERALL TOTAL		***6,082***	***7,538***	***7%***	***8%***	***92,821***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Euclid Avenue (SR-83) / Pine Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	186	185	18500%	1	212	211	21100%
	Through	5	745	740	14800%	5	1,027	1,022	20440%
	Right	1	518	517	51700%	1	770	769	76900%
	NB Total	7	1,449	1,442	20600%	7	2,009	2,002	28600%
SOUTH BOUND	Left	1	247	246	24600%	1	318	317	31700%
	Through	5	1,345	1,340	26800%	5	1,215	1,210	24200%
	Right	1	89	88	8800%	1	88	87	8700%
	SB Total	7	1,681	1,674	23914%	7	1,621	1,614	23057%
EAST BOUND	Left	1	53	52	5200%	1	128	127	12700%
	Through	2	329	327	16350%	2	865	863	43150%
	Right	1	199	198	19800%	1	367	366	36600%
	EB Total	4	581	577	14425%	4	1,360	1,356	33900%
WEST BOUND	Left	1	705	704	70400%	1	851	850	85000%
	Through	2	418	416	20800%	2	552	550	27500%
	Right	1	187	186	18600%	1	297	296	29600%
	WB Total	4	1,310	1,306	32650%	4	1,700	1,696	42400%
TOTAL ENTERING VOLUME		22	5,021	4999	22723%	22	6,690	6668	30309%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,681	1,621			
North Leg	Outbound	985	1,452			
North Leg	**TOTAL**	**2,666**	**3,073**	**7%**	**8%**	**38,999**
South Leg	Inbound	1,449	2,009			
South Leg	Outbound	2,249	2,433			
South Leg	**TOTAL**	**3,698**	**4,442**	**7%**	**8%**	**55,477**
East Leg	Inbound	1,310	1,700			
East Leg	Outbound	1,094	1,953			
East Leg	**TOTAL**	**2,404**	**3,653**	**6%**	**10%**	**37,229**
West Leg	Inbound	581	1,360			
West Leg	Outbound	693	852			
West Leg	**TOTAL**	**1,274**	**2,212**	**6%**	**11%**	**19,883**
OVERALL TOTAL		***10,042***	***13,380***	***7%***	***9%***	***151,588***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: SR-71 Northbound Ramps / Euclid Avenue (SR-83)
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	234	233	23300%	1	262	261	26100%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	942	941	94100%	1	1,218	1,217	121700%
	NB Total	2	1,176	1,174	58700%	2	1,480	1,478	73900%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	528	526	26300%	2	817	815	40750%
	Right	1	6	5	500%	1	3	2	200%
	EB Total	3	534	531	17700%	3	820	817	27233%
WEST BOUND	Left	1	94	93	9300%	1	37	36	3600%
	Through	2	2,116	2,114	105700%	2	2,334	2,332	116600%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	3	2,210	2,207	73567%	3	2,371	2,368	78933%
TOTAL ENTERING VOLUME		8	3,920	3912	48900%	8	4,671	4663	58288%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	1,176	1,480			
South Leg	Outbound	100	40			
South Leg	**TOTAL**	**1,276**	**1,520**	**6%**	**7%**	**21,371**
East Leg	Inbound	2,210	2,371			
East Leg	Outbound	1,470	2,035			
East Leg	**TOTAL**	**3,680**	**4,406**	**7%**	**8%**	**55,993**
West Leg	Inbound	534	820			
West Leg	Outbound	2,350	2,596			
West Leg	**TOTAL**	**2,884**	**3,416**	**7%**	**8%**	**40,456**
OVERALL TOTAL		***7,840***	***9,342***	***7%***	***8%***	***117,820***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: SR-71 Southbound Ramps / Euclid Avenue (SR-83)
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	60	102	43	71%	29	24	-5	-17%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	288	241	-47	-16%	15	16	1	7%
	NB Total	348	343	-5	-1%	44	40	-4	-9%
SOUTH BOUND	Left	256	232	-24	-9%	696	603	-93	-13%
	Through	20	68	48	240%	138	275	137	99%
	Right	35	64	30	86%	150	102	-48	-32%
	SB Total	311	364	54	17%	984	980	-4	0%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	742	911	170	23%	268	412	144	54%
	Right	16	73	57	356%	42	148	106	252%
	EB Total	758	984	227	30%	310	560	250	81%
WEST BOUND	Left	381	1,283	902	237%	97	755	658	678%
	Through	204	376	172	84%	194	515	321	165%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	585	1,659	1,074	184%	291	1,270	979	336%
TOTAL ENTERING VOLUME		2,001	3,350	1349.5	67%	1,629	2,850	1221	75%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	364	980			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**364**	**980**	**2%**	**5%**	**21,582**
South Leg	Inbound	343	40			
South Leg	Outbound	1,424	1,178			
South Leg	**TOTAL**	**1,767**	**1,218**	**16%**	**11%**	**10,988**
East Leg	Inbound	1,659	1,270			
East Leg	Outbound	1,384	1,031			
East Leg	**TOTAL**	**3,043**	**2,301**	**14%**	**10%**	**21,944**
West Leg	Inbound	984	560			
West Leg	Outbound	542	641			
West Leg	**TOTAL**	**1,526**	**1,201**	**5%**	**4%**	**30,141**
OVERALL TOTAL		***6,700***	***5,700***	***8%***	***7%***	***84,655***

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Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: Rincon Meadows Avenue / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	36	35	3500%	1	33	32	3200%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	141	140	14000%	1	143	142	14200%
	NB Total	2	177	175	8750%	2	176	174	8700%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	669	667	33350%	2	1,157	1,155	57750%
	Right	1	22	21	2100%	1	49	48	4800%
	EB Total	3	691	688	22933%	3	1,206	1,203	40100%
WEST BOUND	Left	1	98	97	9700%	1	171	170	17000%
	Through	2	784	782	39100%	2	937	935	46750%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	3	882	879	29300%	3	1,108	1,105	36833%
TOTAL ENTERING VOLUME		8	1,750	1742	21775%	8	2,490	2482	31025%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	177	176			
South Leg	Outbound	120	220			
South Leg	**TOTAL**	**297**	**396**	**6%**	**9%**	**4,581**
East Leg	Inbound	882	1,108			
East Leg	Outbound	810	1,300			
East Leg	**TOTAL**	**1,692**	**2,408**	**6%**	**9%**	**26,281**
West Leg	Inbound	691	1,206			
West Leg	Outbound	820	970			
West Leg	**TOTAL**	**1,511**	**2,176**	**7%**	**10%**	**22,072**
OVERALL TOTAL		***3,500***	***4,980***	***7%***	***9%***	***52,934***

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Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: Mill Creek Avenue / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	42	41	4100%	1	48	47	4700%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	199	198	19800%	1	211	210	21000%
	NB Total	2	241	239	11950%	2	259	257	12850%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	831	829	41450%	2	1,309	1,307	65350%
	Right	1	34	33	3300%	1	63	62	6200%
	EB Total	3	865	862	28733%	3	1,372	1,369	45633%
WEST BOUND	Left	1	176	175	17500%	1	237	236	23600%
	Through	2	888	886	44300%	2	1,132	1,130	56500%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	3	1,064	1,061	35367%	3	1,369	1,366	45533%
TOTAL ENTERING VOLUME		8	2,170	2162	27025%	8	3,000	2992	37400%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	241	259			
South Leg	Outbound	210	300			
South Leg	**TOTAL**	**451**	**559**	**5%**	**7%**	**8,293**
East Leg	Inbound	1,064	1,369			
East Leg	Outbound	1,030	1,520			
East Leg	**TOTAL**	**2,094**	**2,889**	**6%**	**9%**	**33,968**
West Leg	Inbound	865	1,372			
West Leg	Outbound	930	1,180			
West Leg	**TOTAL**	**1,795**	**2,552**	**7%**	**10%**	**26,281**
OVERALL TOTAL		***4,340***	***6,000***	**6%**	***9%***	***68,542***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Main Street / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	189	188	18800%	1	186	185	18500%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	191	190	19000%	1	184	183	18300%
	NB Total	2	380	378	18900%	2	370	368	18400%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	894	892	44600%	2	1,296	1,294	64700%
	Right	1	137	136	13600%	1	224	223	22300%
	EB Total	3	1,031	1,028	34267%	3	1,520	1,517	50567%
WEST BOUND	Left	1	144	143	14300%	1	216	215	21500%
	Through	2	935	933	46650%	2	1,264	1,262	63100%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	3	1,079	1,076	35867%	3	1,480	1,477	49233%
TOTAL ENTERING VOLUME		8	2,490	2482	31025%	8	3,370	3362	42025%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	380	370			
South Leg	Outbound	281	440			
South Leg	**TOTAL**	**661**	**810**	**7%**	**8%**	**9,560**
East Leg	Inbound	1,079	1,480			
East Leg	Outbound	1,085	1,480			
East Leg	**TOTAL**	**2,164**	**2,960**	**4%**	**5%**	**53,996**
West Leg	Inbound	1,031	1,520			
West Leg	Outbound	1,124	1,450			
West Leg	**TOTAL**	**2,155**	**2,970**	**6%**	**9%**	**33,968**
OVERALL TOTAL		***4,980***	***6,740***	**5%**	***7%***	***97,524***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[50 Main_Kimball_SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year (Post-2040)	Analyst:	CHS
		Date:	10/12/16

LOCATION: Flight Avenue / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	52	51	5100%	1	84	83	8300%
	Through	1	16	15	1500%	1	16	15	1500%
	Right	1	13	12	1200%	1	22	21	2100%
	NB Total	3	81	78	2600%	3	122	119	3967%
SOUTH BOUND	Left	1	45	44	4400%	1	99	98	9800%
	Through	1	8	7	700%	1	25	24	2400%
	Right	1	181	180	18000%	1	384	383	38300%
	SB Total	3	234	231	7700%	3	508	505	16833%
EAST BOUND	Left	1	289	288	28800%	1	269	268	26800%
	Through	3	731	728	24267%	3	1,090	1,087	36233%
	Right	1	41	40	4000%	1	93	92	9200%
	EB Total	5	1,061	1,056	21120%	5	1,452	1,447	28940%
WEST BOUND	Left	1	12	11	1100%	1	22	21	2100%
	Through	3	857	854	28467%	3	1,022	1,019	33967%
	Right	1	85	84	8400%	1	65	64	6400%
	WB Total	5	954	949	18980%	5	1,109	1,104	22080%
TOTAL ENTERING VOLUME		16	2,330	2314	14463%	16	3,191	3175	19844%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	234	508			
North Leg	Outbound	390	350			
North Leg	**TOTAL**	**624**	**858**	**7%**	**9%**	**9,085**
South Leg	Inbound	81	122			
South Leg	Outbound	61	140			
South Leg	**TOTAL**	**142**	**262**	**6%**	**12%**	**2,189**
East Leg	Inbound	954	1,109			
East Leg	Outbound	789	1,211			
East Leg	**TOTAL**	**1,743**	**2,320**	**6%**	**9%**	**26,857**
West Leg	Inbound	1,061	1,452			
West Leg	Outbound	1,090	1,490			
West Leg	**TOTAL**	**2,151**	**2,942**	**6%**	**9%**	**33,996**
OVERALL TOTAL		***4,660***	***6,382***	**6%**	***9%***	***72,127***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[51 Flight_Kimbal-SEMI.xls]Output (3)

Project: Kimball Business Center
Scenario: Horizon Year (Post-2040)

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: Hellman Avenue / Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	163	162	16200%	1	201	200	20000%
	Through	2	60	58	2900%	2	53	51	2550%
	Right	1	298	297	29700%	1	448	447	44700%
	NB Total	4	521	517	12925%	4	702	698	17450%
SOUTH BOUND	Left	1	21	20	2000%	1	43	42	4200%
	Through	2	28	26	1300%	2	69	67	3350%
	Right	1	11	10	1000%	1	19	18	1800%
	SB Total	4	60	56	1400%	4	131	127	3175%
EAST BOUND	Left	1	20	19	1900%	1	20	19	1900%
	Through	3	601	598	19933%	3	999	996	33200%
	Right	1	132	131	13100%	1	269	268	26800%
	EB Total	5	753	748	14960%	5	1,288	1,283	25660%
WEST BOUND	Left	1	331	330	33000%	1	503	502	50200%
	Through	3	825	822	27400%	3	840	837	27900%
	Right	1	50	49	4900%	1	37	36	3600%
	WB Total	5	1,206	1,201	24020%	5	1,380	1,375	27500%
TOTAL ENTERING VOLUME		18	2,540	2522	14011%	18	3,501	3483	19350%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	60	131			
North Leg	Outbound	130	110			
North Leg	**TOTAL**	**190**	**241**	**8%**	**10%**	**2,515**
South Leg	Inbound	521	702			
South Leg	Outbound	491	841			
South Leg	**TOTAL**	**1,012**	**1,543**	**7%**	**10%**	**14,860**
East Leg	Inbound	1,206	1,380			
East Leg	Outbound	920	1,490			
East Leg	**TOTAL**	**2,126**	**2,870**	**6%**	**9%**	**33,374**
West Leg	Inbound	753	1,288			
West Leg	Outbound	999	1,060			
West Leg	**TOTAL**	**1,752**	**2,348**	**6%**	**9%**	**27,325**
OVERALL TOTAL		***5,080***	***7,002***	***7%***	***9%***	***78,074***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[53 Hellman_Kimball-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year	Analyst:	CHS
		Date:	10/12/16

LOCATION: Archibald Avenue / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	120	119	11900%	1	82	81	8100%
	Through	3	1,376	1,373	45767%	3	1,439	1,436	47867%
	Right	1	404	403	40300%	1	380	379	37900%
	NB Total	5	1,900	1,895	37900%	5	1,901	1,896	37920%
SOUTH BOUND	Left	1	748	747	74700%	1	1,103	1,102	110200%
	Through	3	1,019	1,016	33867%	3	1,578	1,575	52500%
	Right	1	223	222	22200%	1	237	236	23600%
	SB Total	5	1,990	1,985	39700%	5	2,918	2,913	58260%
EAST BOUND	Left	1	230	229	22900%	1	285	284	28400%
	Through	2	608	606	30300%	2	677	675	33750%
	Right	1	92	91	9100%	1	108	107	10700%
	EB Total	4	930	926	23150%	4	1,070	1,066	26650%
WEST BOUND	Left	1	329	328	32800%	1	444	443	44300%
	Through	2	647	645	32250%	2	601	599	29950%
	Right	1	824	823	82300%	1	1,176	1,175	117500%
	WB Total	4	1,800	1,796	44900%	4	2,221	2,217	55425%
TOTAL ENTERING VOLUME		18	6,620	6602	36678%	18	8,110	8092	44956%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,990	2,918			
North Leg	Outbound	2,430	2,900			
North Leg	**TOTAL**	**4,420**	**5,818**	**7%**	**10%**	**60,359**
South Leg	Inbound	1,900	1,901			
South Leg	Outbound	1,440	2,130			
South Leg	**TOTAL**	**3,340**	**4,031**	**8%**	**10%**	**42,229**
East Leg	Inbound	1,800	2,221			
East Leg	Outbound	1,760	2,160			
East Leg	**TOTAL**	**3,560**	**4,381**	**7%**	**9%**	**48,416**
West Leg	Inbound	930	1,070			
West Leg	Outbound	990	920			
West Leg	**TOTAL**	**1,920**	**1,990**	**8%**	**8%**	**24,634**
OVERALL TOTAL		***13,240***	***16,220***	**8%**	***9%***	***175,638***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year	Analyst:	CHS
		Date:	10/12/16

LOCATION: Harrison Avenue / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	119	118	11800%	1	135	134	13400%
	Through	1	57	56	5600%	1	58	57	5700%
	Right	1	144	143	14300%	1	157	156	15600%
	NB Total	3	320	317	10567%	3	350	347	11567%
SOUTH BOUND	Left	1	164	163	16300%	1	109	108	10800%
	Through	1	30	29	2900%	1	109	108	10800%
	Right	1	136	135	13500%	1	93	92	9200%
	SB Total	3	330	327	10900%	3	311	308	10267%
EAST BOUND	Left	1	71	70	7000%	1	78	77	7700%
	Through	2	1,632	1,630	81500%	2	1,894	1,892	94600%
	Right	1	33	32	3200%	1	210	209	20900%
	EB Total	4	1,736	1,732	43300%	4	2,182	2,178	54450%
WEST BOUND	Left	1	38	37	3700%	1	251	250	25000%
	Through	2	1,545	1,543	77150%	2	1,942	1,940	97000%
	Right	1	82	81	8100%	1	93	92	9200%
	WB Total	4	1,665	1,661	41525%	4	2,286	2,282	57050%
TOTAL ENTERING VOLUME		14	4,051	4037	28836%	14	5,129	5115	36536%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	330	311			
North Leg	Outbound	210	229			
North Leg	**TOTAL**	**540**	**540**	**8%**	**8%**	**6,871**
South Leg	Inbound	320	350			
South Leg	Outbound	101	570			
South Leg	**TOTAL**	**421**	**920**	**6%**	**13%**	**7,005**
East Leg	Inbound	1,665	2,286			
East Leg	Outbound	1,940	2,160			
East Leg	**TOTAL**	**3,605**	**4,446**	**7%**	**9%**	**49,085**
West Leg	Inbound	1,736	2,182			
West Leg	Outbound	1,800	2,170			
West Leg	**TOTAL**	**3,536**	**4,352**	**7%**	**9%**	**48,076**
OVERALL TOTAL		***8,102***	***10,258***	***7%***	***9%***	***111,037***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[55 Harrison_Limonite-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year	Analyst:	CHS
		Date:	10/12/16

LOCATION: Sumner Avenue / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	388	387	38700%	1	422	421	42100%
	Through	1	0	-1	-100%	1	79	78	7800%
	Right	1	276	275	27500%	1	321	320	32000%
	NB Total	3	664	661	22033%	3	822	819	27300%
SOUTH BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	1	0	-1	-100%	1	0	-1	-100%
	SB Total	3	0	-3	-100%	3	0	-3	-100%
EAST BOUND	Left	1	0	-1	-100%	1	43	42	4200%
	Through	2	1,634	1,632	81600%	2	1,579	1,577	78850%
	Right	1	295	294	29400%	1	541	540	54000%
	EB Total	4	1,929	1,925	48125%	4	2,163	2,159	53975%
WEST BOUND	Left	1	165	164	16400%	1	489	488	48800%
	Through	2	1,282	1,280	64000%	2	1,868	1,866	93300%
	Right	1	0	-1	-100%	1	39	38	3800%
	WB Total	4	1,447	1,443	36075%	4	2,396	2,392	59800%
TOTAL ENTERING VOLUME		14	4,040	4026	28757%	14	5,381	5367	38336%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	161			
North Leg	**TOTAL**	**0**	**161**	**0%**	**28%**	**574**
South Leg	Inbound	664	822			
South Leg	Outbound	460	1,030			
South Leg	**TOTAL**	**1,124**	**1,852**	**8%**	**13%**	**14,464**
East Leg	Inbound	1,447	2,396			
East Leg	Outbound	1,910	1,900			
East Leg	**TOTAL**	**3,357**	**4,296**	**7%**	**9%**	**48,155**
West Leg	Inbound	1,929	2,163			
West Leg	Outbound	1,670	2,290			
West Leg	**TOTAL**	**3,599**	**4,453**	**7%**	**9%**	**49,085**
OVERALL TOTAL		***8,080***	***10,762***	***7%***	***10%***	***112,278***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[56 Sumner_Limonite-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year	Analyst:	CHS
		Date:	10/12/16

LOCATION: Scholar Way / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	78	77	7700%	1	271	270	27000%
	Through	1	9	8	800%	1	19	18	1800%
	Right	1	36	35	3500%	1	50	49	4900%
	NB Total	3	123	120	4000%	3	340	337	11233%
SOUTH BOUND	Left	1	27	26	2600%	1	12	11	1100%
	Through	1	8	7	700%	1	14	13	1300%
	Right	1	57	56	5600%	1	66	65	6500%
	SB Total	3	92	89	2967%	3	92	89	2967%
EAST BOUND	Left	1	45	44	4400%	1	65	64	6400%
	Through	2	1,727	1,725	86250%	2	1,528	1,526	76300%
	Right	1	60	59	5900%	1	197	196	19600%
	EB Total	4	1,832	1,828	45700%	4	1,790	1,786	44650%
WEST BOUND	Left	1	21	20	2000%	1	49	48	4800%
	Through	2	1,295	1,293	64650%	2	2,053	2,051	102550%
	Right	1	16	15	1500%	1	16	15	1500%
	WB Total	4	1,332	1,328	33200%	4	2,118	2,114	52850%
TOTAL ENTERING VOLUME		14	3,379	3365	24036%	14	4,340	4326	30900%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	92	92			
North Leg	Outbound	70	100			
North Leg	**TOTAL**	**162**	**192**	**7%**	**8%**	**2,294**
South Leg	Inbound	123	340			
South Leg	Outbound	89	260			
South Leg	**TOTAL**	**212**	**600**	**5%**	**15%**	**3,893**
East Leg	Inbound	1,332	2,118			
East Leg	Outbound	1,790	1,590			
East Leg	**TOTAL**	**3,122**	**3,708**	**7%**	**9%**	**42,913**
West Leg	Inbound	1,832	1,790			
West Leg	Outbound	1,430	2,390			
West Leg	**TOTAL**	**3,262**	**4,180**	**7%**	**9%**	**48,155**
OVERALL TOTAL		***6,758***	***8,680***	***7%***	***9%***	***97,255***

U:\UcJobs_09600-10000_09700\09774\Post Processing\[57 Scholar_Limonite-SEMI.xls]Output (3)

Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year	Analyst:	CHS
		Date:	10/12/16

LOCATION: Hamner Avenue / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	126	125	12500%	1	237	236	23600%
	Through	2	657	655	32750%	2	1,010	1,008	50400%
	Right	1	317	316	31600%	1	363	362	36200%
	NB Total	4	1,100	1,096	27400%	4	1,610	1,606	40150%
SOUTH BOUND	Left	1	660	659	65900%	1	633	632	63200%
	Through	2	437	435	21750%	2	983	981	49050%
	Right	1	262	261	26100%	1	413	412	41200%
	SB Total	4	1,359	1,355	33875%	4	2,029	2,025	50625%
EAST BOUND	Left	1	317	316	31600%	1	332	331	33100%
	Through	2	1,373	1,371	68550%	2	1,073	1,071	53550%
	Right	1	101	100	10000%	1	185	184	18400%
	EB Total	4	1,791	1,787	44675%	4	1,590	1,586	39650%
WEST BOUND	Left	1	162	161	16100%	1	362	361	36100%
	Through	2	872	870	43500%	2	1,369	1,367	68350%
	Right	1	506	505	50500%	1	648	647	64700%
	WB Total	4	1,540	1,536	38400%	4	2,379	2,375	59375%
TOTAL ENTERING VOLUME		16	5,790	5774	36088%	16	7,608	7592	47450%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,359	2,029			
North Leg	Outbound	1,480	1,990			
North Leg	**TOTAL**	**2,839**	**4,019**	**8%**	**11%**	**36,899**
South Leg	Inbound	1,100	1,610			
South Leg	Outbound	700	1,530			
South Leg	**TOTAL**	**1,800**	**3,140**	**8%**	**14%**	**23,228**
East Leg	Inbound	1,540	2,379			
East Leg	Outbound	2,350	2,069			
East Leg	**TOTAL**	**3,890**	**4,448**	**7%**	**8%**	**54,466**
West Leg	Inbound	1,791	1,590			
West Leg	Outbound	1,260	2,019			
West Leg	**TOTAL**	**3,051**	**3,609**	**7%**	**8%**	**42,913**
OVERALL TOTAL		***11,580***	***15,216***	***7%***	***10%***	***157,506***

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Project: Kimball Business Center
Scenario: Horizon Year

Job #: 9774
Analyst: CHS
Date: 10/12/16

LOCATION: I-15 Southbound Ramps / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
SOUTH BOUND	Left	1	424	423	42300%	1	497	496	49600%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	237	236	23600%	1	503	502	50200%
	SB Total	2	661	659	32950%	2	1,000	998	49900%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	1,960	1,958	97900%	2	1,643	1,641	82050%
	Right	1	786	785	78500%	1	687	686	68600%
	EB Total	3	2,746	2,743	91433%	3	2,330	2,327	77567%
WEST BOUND	Left	1	1,057	1,056	105600%	1	913	912	91200%
	Through	2	1,476	1,474	73700%	2	2,207	2,205	110250%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	3	2,533	2,530	84333%	3	3,120	3,117	103900%
TOTAL ENTERING VOLUME		8	5,940	5932	74150%	8	6,450	6442	80525%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	661	1,000			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**661**	**1,000**	**6%**	**9%**	**10,602**
South Leg	Inbound	0	0			
South Leg	Outbound	1,843	1,600			
South Leg	**TOTAL**	**1,843**	**1,600**	**9%**	**7%**	**21,382**
East Leg	Inbound	2,533	3,120			
East Leg	Outbound	2,384	2,140			
East Leg	**TOTAL**	**4,917**	**5,260**	**8%**	**8%**	**64,997**
West Leg	Inbound	2,746	2,330			
West Leg	Outbound	1,713	2,710			
West Leg	**TOTAL**	**4,459**	**5,040**	**7%**	**8%**	**62,094**
OVERALL TOTAL		***11,880***	***12,900***	***7%***	***8%***	***159,075***

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Project:	Kimball Business Center	Job #:	9774
Scenario:	Horizon Year	Analyst:	CHS
		Date:	10/12/16

LOCATION: I-15 Northbound Ramps / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	596	595	59500%	1	597	596	59600%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1	654	653	65300%	1	910	909	90900%
	NB Total	2	1,250	1,248	62400%	2	1,507	1,505	75250%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	1	387	386	38600%	1	240	239	23900%
	Through	2	1,996	1,994	99700%	2	1,920	1,918	95900%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	3	2,383	2,380	79333%	3	2,160	2,157	71900%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	2	1,944	1,942	97100%	2	2,523	2,521	126050%
	Right	1	413	412	41200%	1	480	479	47900%
	WB Total	3	2,357	2,354	78467%	3	3,003	3,000	100000%
TOTAL ENTERING VOLUME		8	5,990	5982	74775%	8	6,670	6662	83275%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	800	720			
North Leg	**TOTAL**	**800**	**720**	**9%**	**8%**	**8,930**
South Leg	Inbound	1,250	1,507			
South Leg	Outbound	0	0			
South Leg	**TOTAL**	**1,250**	**1,507**	**7%**	**8%**	**19,142**
East Leg	Inbound	2,357	3,003			
East Leg	Outbound	2,650	2,830			
East Leg	**TOTAL**	**5,007**	**5,833**	**7%**	**9%**	**67,899**
West Leg	Inbound	2,383	2,160			
West Leg	Outbound	2,540	3,120			
West Leg	**TOTAL**	**4,923**	**5,280**	**8%**	**8%**	**64,997**
OVERALL TOTAL		***11,980***	***13,340***	***7%***	***8%***	***160,968***

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APPENDIX 5.1:

E+P (PHASE 1) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1153	305	6	918	472	82	384
Future Volume (vph)	1153	305	6	918	472	82	384
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.40	0.36	0.04	0.54	0.55	0.53	0.67
Control Delay	11.4	3.2	27.0	9.4	21.3	20.4	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	3.2	27.0	9.4	21.3	20.4	18.7
LOS	B	A	C	A	C	C	B
Approach Delay	9.7			9.5		20.0	
Approach LOS	A			A		B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1153	305	6	918	0	0	0	0	472	82	384
Future Volume (veh/h)	0	1153	305	6	918	0	0	0	0	472	82	384
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1189	244	6	946	0				548	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1189	244	6	946	0				548	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	8.3	6.6	0.2	8.5	0.0				8.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.3	6.6	0.2	8.5	0.0				8.1	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.46	0.38	0.47	0.54	0.00				0.51	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.78	0.78	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.6	12.1	29.6	6.2	0.0				16.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.4	7.4	1.0	0.0				1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	2.8	0.1	4.1	0.0				3.8	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.7	12.5	37.0	7.1	0.0				17.8	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1433			952						548	
Approach Delay, s/veh		12.7			7.3						17.8	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	10.3		10.1		10.5		
Green Ext Time (p_c), s	0.0	8.5		1.1		14.8		

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	537	1088	563	299	361	192
Future Volume (vph)	537	1088	563	299	361	192
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	46.0	30.0	30.0	14.0	14.0
Total Split (%)	26.7%	76.7%	50.0%	50.0%	23.3%	23.3%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	39.5	23.5	23.5	8.0	8.0
Actuated g/C Ratio	0.18	0.66	0.39	0.39	0.13	0.13
v/c Ratio	1.05	0.51	0.44	0.47	0.99	0.93
Control Delay	80.6	5.9	14.7	9.7	94.1	57.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.6	5.9	14.7	9.7	94.1	57.7
LOS	F	A	B	A	F	E
Approach Delay		30.6	13.0			69.7
Approach LOS		C	B			E

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 32.8	Intersection LOS: C
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	537	1088	0	0	563	299	361	192	9	0	0	0
Future Volume (veh/h)	537	1088	0	0	563	299	361	192	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	565	1145	0	0	593	314	395	181	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	542	2252	0	0	1340	590	432	231	8			
Arrive On Green	0.18	0.66	0.00	0.00	0.39	0.39	0.13	0.13	0.13			
Sat Flow, veh/h	2956	3510	0	0	3510	1505	3238	1732	57			
Grp Volume(v), veh/h	565	1145	0	0	593	314	395	0	187			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1505	1619	0	1790			
Q Serve(g_s), s	11.0	10.3	0.0	0.0	7.7	9.6	7.2	0.0	6.1			
Cycle Q Clear(g_c), s	11.0	10.3	0.0	0.0	7.7	9.6	7.2	0.0	6.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	542	2252	0	0	1340	590	432	0	239			
V/C Ratio(X)	1.04	0.51	0.00	0.00	0.44	0.53	0.91	0.00	0.78			
Avail Cap(c_a), veh/h	542	2252	0	0	1340	590	432	0	239			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.72	0.72	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.5	5.3	0.0	0.0	13.4	14.0	25.7	0.0	25.2			
Incr Delay (d2), s/veh	48.3	0.7	0.0	0.0	0.8	2.5	26.5	0.0	22.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.1	5.0	0.0	0.0	3.7	4.3	4.8	0.0	4.4			
LnGrp Delay(d),s/veh	72.8	6.0	0.0	0.0	14.2	16.5	52.2	0.0	47.4			
LnGrp LOS	F	A			B	B	D		D			
Approach Vol, veh/h		1710			907			582				
Approach Delay, s/veh		28.1			15.0			50.6				
Approach LOS		C			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		46.0			16.0	30.0		14.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		39.5			11.0	23.5		8.0
Max Q Clear Time (g_c+I1), s		12.3			13.0	11.6		9.2
Green Ext Time (p_c), s		15.6			0.0	8.7		0.0

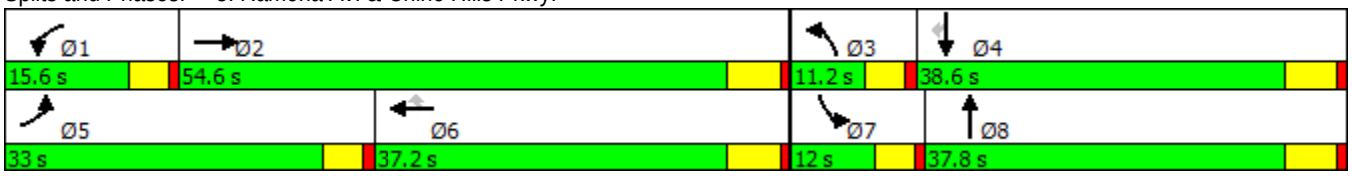
Intersection Summary	
HCM 2010 Ctrl Delay	28.5
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	340	753	65	594	91	26	384	78	174	241
Future Volume (vph)	340	753	65	594	91	26	384	78	174	241
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	27.3	48.3	8.7	27.5	27.5	6.0	32.1	7.4	37.6	37.6
Actuated g/C Ratio	0.24	0.42	0.08	0.24	0.24	0.05	0.28	0.06	0.33	0.33
v/c Ratio	0.94	0.39	0.56	0.77	0.20	0.33	0.59	0.80	0.16	0.38
Control Delay	76.6	24.4	69.9	47.8	1.9	64.9	36.6	101.6	30.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.6	24.4	69.9	47.8	1.9	64.9	36.6	101.6	30.8	6.0
LOS	E	C	E	D	A	E	D	F	C	A
Approach Delay		40.6		44.1			38.0		29.8	
Approach LOS		D		D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.1	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 39.2	Intersection LOS: D
Intersection Capacity Utilization 87.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	753	4	65	594	91	26	384	144	78	174	241
Future Volume (veh/h)	340	753	4	65	594	91	26	384	144	78	174	241
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	358	793	3	68	625	79	27	404	84	82	183	158
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	2159	8	85	835	368	41	782	161	101	1077	474
Arrive On Green	0.24	0.43	0.43	0.05	0.24	0.24	0.03	0.28	0.28	0.06	0.31	0.31
Sat Flow, veh/h	1619	5053	19	1619	3420	1507	1619	2817	580	1619	3420	1504
Grp Volume(v), veh/h	358	514	282	68	625	79	27	244	244	82	183	158
Grp Sat Flow(s),veh/h/ln	1619	1638	1796	1619	1710	1507	1619	1710	1687	1619	1710	1504
Q Serve(g_s), s	25.0	12.3	12.3	4.8	19.5	4.8	1.9	13.8	14.1	5.8	4.5	9.3
Cycle Q Clear(g_c), s	25.0	12.3	12.3	4.8	19.5	4.8	1.9	13.8	14.1	5.8	4.5	9.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	381	1399	767	85	835	368	41	475	468	101	1077	474
V/C Ratio(X)	0.94	0.37	0.37	0.80	0.75	0.21	0.66	0.51	0.52	0.81	0.17	0.33
Avail Cap(c_a), veh/h	399	1399	767	154	931	410	93	475	468	104	1077	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.3	22.4	22.4	54.0	40.3	34.7	55.7	35.1	35.2	53.4	28.6	30.2
Incr Delay (d2), s/veh	29.0	0.2	0.4	6.4	3.4	0.4	6.7	3.9	4.1	33.4	0.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	5.6	6.2	2.3	9.6	2.0	0.9	7.0	7.1	3.5	2.2	4.1
LnGrp Delay(d),s/veh	72.2	22.7	22.9	60.5	43.7	35.2	62.4	39.0	39.3	86.8	28.9	32.1
LnGrp LOS	E	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1154			772			515			423	
Approach Delay, s/veh		38.1			44.3			40.4			41.3	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	55.0	7.5	42.1	31.7	34.0	11.8	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	6.8	14.3	3.9	11.3	27.0	21.5	7.8	16.1
Green Ext Time (p_c), s	0.0	16.2	0.0	4.3	0.1	6.6	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	40.6
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	766	93	27	634	105	31
Future Vol, veh/h	766	93	27	634	105	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	842	102	30	697	115	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	842	0	1250	421
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	408	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	802	-	168	587
Stage 1	-	-	-	-	388	-
Stage 2	-	-	-	-	646	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	802	-	162	587
Mov Cap-2 Maneuver	-	-	-	-	338	-
Stage 1	-	-	-	-	388	-
Stage 2	-	-	-	-	622	-

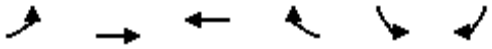
Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	20.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	374	-	-	802	-
HCM Lane V/C Ratio	0.4	-	-	0.037	-
HCM Control Delay (s)	20.9	-	-	9.7	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.9	-	-	0.1	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	212	584	566	64	94
Future Volume (vph)	212	584	566	64	94
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	92.0	50.0	28.0	42.0
Total Split (%)	35.0%	76.7%	41.7%	23.3%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	15.8	42.9	22.4	22.6	39.6
Actuated g/C Ratio	0.20	0.55	0.29	0.29	0.51
v/c Ratio	0.70	0.33	0.66	0.08	0.12
Control Delay	41.0	9.5	27.7	24.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	9.5	27.7	24.0	2.5
LOS	D	A	C	C	A
Approach Delay		17.8	27.7	11.2	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 77.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	212	584	566	30	64	94
Future Volume (veh/h)	212	584	566	30	64	94
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	230	635	615	33	70	27
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	269	1938	1127	60	842	690
Arrive On Green	0.17	0.57	0.34	0.34	0.28	0.28
Sat Flow, veh/h	1619	3510	3392	177	2956	1530
Grp Volume(v), veh/h	230	635	318	330	70	27
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1769	1478	1530
Q Serve(g_s), s	10.8	7.7	11.7	11.8	1.4	0.8
Cycle Q Clear(g_c), s	10.8	7.7	11.7	11.8	1.4	0.8
Prop In Lane	1.00			0.10	1.00	1.00
Lane Grp Cap(c), veh/h	269	1938	584	604	842	690
V/C Ratio(X)	0.85	0.33	0.55	0.55	0.08	0.04
Avail Cap(c_a), veh/h	776	3780	969	1002	842	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	9.0	20.8	20.8	20.4	12.0
Incr Delay (d2), s/veh	3.0	0.1	1.1	1.1	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	3.7	5.7	5.9	0.6	0.9
LnGrp Delay(d),s/veh	34.6	9.1	21.9	21.9	20.6	12.1
LnGrp LOS	C	A	C	C	C	B
Approach Vol, veh/h		865	648		97	
Approach Delay, s/veh		15.9	21.9		18.3	
Approach LOS		B	C		B	

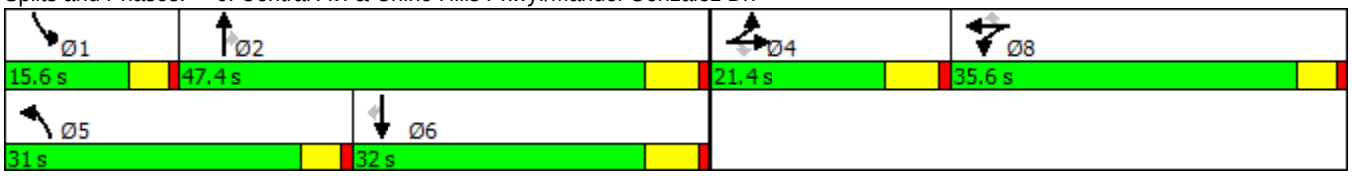
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		50.0		28.0	17.6	32.4		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		86.2		22.2	37.4	44.2		
Max Q Clear Time (g_c+I1), s		9.7		3.4	12.8	13.8		
Green Ext Time (p_c), s		16.2		0.2	0.3	12.9		

Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	50	206	2	3	7	318	791	43	62	642	245
Future Volume (vph)	295	50	206	2	3	7	318	791	43	62	642	245
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.6	15.6	15.6	13.5	13.5	13.5	25.6	46.8	46.8	7.9	26.8	26.8
Actuated g/C Ratio	0.17	0.17	0.17	0.15	0.15	0.15	0.28	0.50	0.50	0.09	0.29	0.29
v/c Ratio	0.72	0.68	0.51	0.01	0.01	0.02	0.78	0.50	0.06	0.49	0.71	0.46
Control Delay	57.0	53.3	10.4	35.5	35.3	0.1	46.9	20.6	0.1	56.4	36.7	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	53.3	10.4	35.5	35.3	0.1	46.9	20.6	0.1	56.4	36.7	13.0
LOS	E	D	B	D	D	A	D	C	A	E	D	B
Approach Delay		38.4			13.7			27.1			31.8	
Approach LOS		D			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 92.9	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 31.1	Intersection LOS: C
Intersection Capacity Utilization 68.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	295	50	206	2	3	7	318	791	43	62	642	245
Future Volume (veh/h)	295	50	206	2	3	7	318	791	43	62	642	245
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	360	0	128	2	3	3	346	860	35	67	698	211
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	462	0	218	33	37	31	383	1791	785	83	1157	511
Arrive On Green	0.14	0.00	0.14	0.02	0.02	0.02	0.24	0.52	0.52	0.05	0.34	0.34
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	360	0	128	2	3	3	346	860	35	67	698	211
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	8.5	0.0	6.2	0.1	0.1	0.2	16.5	12.7	0.9	3.3	13.5	8.5
Cycle Q Clear(g_c), s	8.5	0.0	6.2	0.1	0.1	0.2	16.5	12.7	0.9	3.3	13.5	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	462	0	218	33	37	31	383	1791	785	83	1157	511
V/C Ratio(X)	0.78	0.00	0.59	0.06	0.08	0.10	0.90	0.48	0.04	0.81	0.60	0.41
Avail Cap(c_a), veh/h	636	0	300	632	702	597	538	1791	785	224	1157	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	31.8	38.2	38.2	38.2	29.4	12.0	9.2	37.3	21.9	20.2
Incr Delay (d2), s/veh	4.2	0.0	2.5	0.8	0.9	1.3	11.8	0.9	0.1	6.7	2.3	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	2.8	0.0	0.1	0.1	8.6	6.2	0.4	1.6	6.7	3.9
LnGrp Delay(d),s/veh	37.0	0.0	34.3	38.9	39.1	39.5	41.2	13.0	9.3	44.0	24.2	22.7
LnGrp LOS	D		C	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		488			8			1241			976	
Approach Delay, s/veh		36.3			39.2			20.7			25.2	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	47.4		17.1	23.4	32.7		6.2
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.3	14.7		10.5	18.5	15.5		2.2
Green Ext Time (p_c), s	0.0	17.3		0.8	0.3	8.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	25.2
HCM 2010 LOS	C

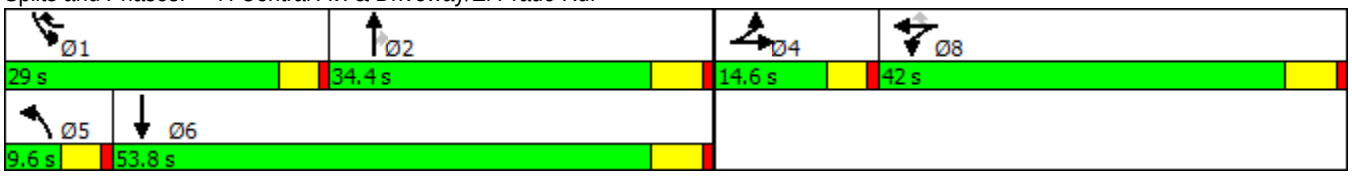
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	895	3	440	2	738	532	325	603
Future Volume (vph)	1	1	895	3	440	2	738	532	325	603
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	0.97	0.92	0.47	0.03	0.91	0.71	0.99	0.27
Control Delay	48.0	41.0	69.5	58.6	6.3	53.0	53.7	8.3	88.3	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	69.5	58.6	6.3	53.0	53.7	8.3	88.3	16.2
LOS	D	D	E	E	A	D	D	A	F	B
Approach Delay		43.3		45.0			34.7			41.2
Approach LOS		D		D			C			D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 108.3
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 40.3 — Intersection LOS: D
Intersection Capacity Utilization 89.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	895	3	440	2	738	532	325	603	9
Future Volume (veh/h)	1	1	1	895	3	440	2	738	532	325	603	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	996	0	346	2	820	422	361	670	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1049	0	834	4	885	391	358	2388	28
Arrive On Green	0.01	0.01	0.01	0.32	0.00	0.32	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5006	60
Grp Volume(v), veh/h	1	0	2	996	0	346	2	820	422	361	438	240
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	33.2	0.0	14.7	0.1	25.8	28.6	24.4	8.9	8.9
Cycle Q Clear(g_c), s	0.1	0.0	0.1	33.2	0.0	14.7	0.1	25.8	28.6	24.4	8.9	8.9
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1049	0	834	4	885	391	358	1563	854
V/C Ratio(X)	0.08	0.00	0.15	0.95	0.00	0.42	0.46	0.93	1.08	1.01	0.28	0.28
Avail Cap(c_a), veh/h	147	0	150	1061	0	839	73	885	391	358	1563	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	0.0	54.4	36.5	0.0	14.8	55.0	39.9	40.9	43.0	17.4	17.4
Incr Delay (d2), s/veh	0.9	0.0	2.0	16.7	0.0	0.3	25.4	16.9	68.4	50.0	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	17.2	0.0	6.3	0.1	14.3	19.3	15.8	4.1	4.6
LnGrp Delay(d),s/veh	55.3	0.0	56.4	53.2	0.0	15.1	80.4	56.8	109.3	93.1	17.9	18.3
LnGrp LOS	E		E	D		B	F	E	F	F	B	B
Approach Vol, veh/h		3			1342			1244			1039	
Approach Delay, s/veh		56.0			43.4			74.7			44.1	
Approach LOS		E			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		41.6
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	10.9		35.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	21.6		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	54.3
HCM 2010 LOS	D

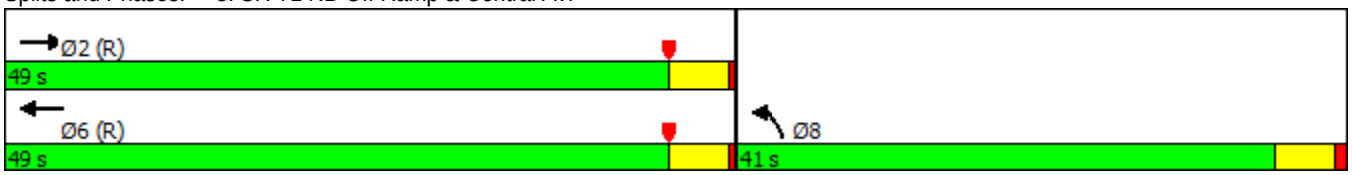
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1001	835	97
Future Volume (vph)	1001	835	97
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	49.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	59.3	59.3	21.2
Actuated g/C Ratio	0.66	0.66	0.24
v/c Ratio	0.68	0.31	1.16dr
Control Delay	6.3	7.4	37.7
Queue Delay	0.0	0.0	0.0
Total Delay	6.3	7.4	37.7
LOS	A	A	D
Approach Delay	6.3	7.4	37.7
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 62.4%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1001	764	0	835	97	364
Future Volume (veh/h)	1001	764	0	835	97	364
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1206	920	0	1006	117	246
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2326	1087	0	3490	298	282
Arrive On Green	1.00	1.00	0.00	0.71	0.18	0.18
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1206	920	0	1006	117	246
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	6.7	5.7	14.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.7	5.7	14.1
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2326	1087	0	3490	298	282
V/C Ratio(X)	0.52	0.85	0.00	0.29	0.39	0.87
Avail Cap(c_a), veh/h	2326	1087	0	3490	648	612
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.8	32.3	35.7
Incr Delay (d2), s/veh	0.8	8.2	0.0	0.2	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.5	0.0	3.0	2.6	6.2
LnGrp Delay(d),s/veh	0.8	8.2	0.0	5.0	32.6	39.0
LnGrp LOS	A	A		A	C	D
Approach Vol, veh/h	2126			1006	363	
Approach Delay, s/veh	4.0			5.0	36.9	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		68.4				68.4		21.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		36.0
Max Q Clear Time (g_c+I1), s		2.0				8.7		16.1
Green Ext Time (p_c), s		25.2				22.7		0.5

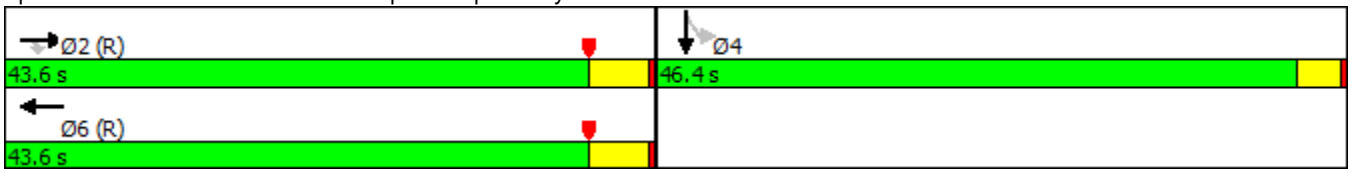
Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1310	69	740	455	0
Future Volume (vph)	1310	69	740	455	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	46.2	46.2	46.2	35.8	35.8
Actuated g/C Ratio	0.51	0.51	0.51	0.40	0.40
v/c Ratio	0.66	0.11	0.47	0.85	0.79
Control Delay	18.9	3.9	10.6	37.9	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	3.9	10.6	37.9	29.9
LOS	B	A	B	D	C
Approach Delay	18.2		10.6		34.0
Approach LOS	B		B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 20.0	Intersection LOS: B
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1310	69	0	740	193	0	0	0	455	0	344
Future Volume (veh/h)	0	1310	69	0	740	193	0	0	0	455	0	344
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1658	0	0	937	244				435	197	294
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2832	882	0	2241	582				542	219	326
Arrive On Green	0.00	0.58	0.00	0.00	1.00	1.00				0.33	0.33	0.33
Sat Flow, veh/h	0	5076	1530	0	4050	1009				1619	653	975
Grp Volume(v), veh/h	0	1658	0	0	789	392				435	0	491
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1622				1619	0	1628
Q Serve(g_s), s	0.0	19.4	0.0	0.0	0.0	0.0				22.0	0.0	25.9
Cycle Q Clear(g_c), s	0.0	19.4	0.0	0.0	0.0	0.0				22.0	0.0	25.9
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.60
Lane Grp Cap(c), veh/h	0	2832	882	0	1888	935				542	0	545
V/C Ratio(X)	0.00	0.59	0.00	0.00	0.42	0.42				0.80	0.00	0.90
Avail Cap(c_a), veh/h	0	2832	882	0	1888	935				772	0	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.2	0.0	0.0	0.0	0.0				27.2	0.0	28.5
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.0	0.7	1.4				2.6	0.0	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.0	0.0	0.0	0.2	0.4				10.2	0.0	12.8
LnGrp Delay(d),s/veh	0.0	13.1	0.0	0.0	0.7	1.4				29.8	0.0	36.7
LnGrp LOS		B			A	A				C		D
Approach Vol, veh/h		1658			1181						926	
Approach Delay, s/veh		13.1			0.9						33.5	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		56.4		33.6		56.4		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		21.4		27.9		2.0		
Green Ext Time (p_c), s		13.9		2.3		23.9		

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

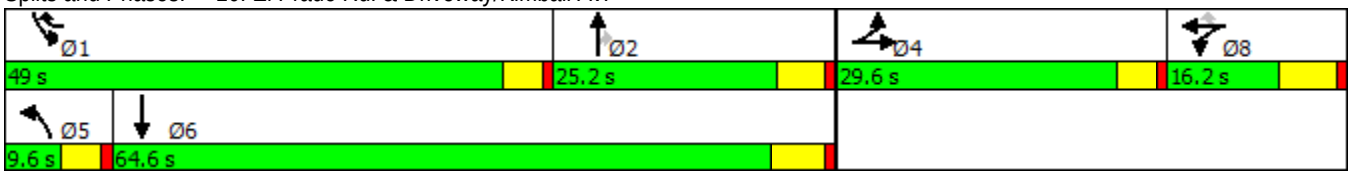
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	1	25	1069	5	270	31	526	195
Future Volume (vph)	11	1	25	1069	5	270	31	526	195
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.4	58.3	5.2	19.1	19.1	46.0	59.2
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.62
v/c Ratio	0.05	0.01	0.28	0.92	0.06	0.76	0.07	0.69	0.12
Control Delay	40.1	30.3	49.4	22.6	52.6	53.8	0.3	29.3	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.3	49.4	22.6	52.6	53.8	0.3	29.3	9.3
LOS	D	C	D	C	D	D	A	C	A
Approach Delay		38.0	23.9			48.3			23.1
Approach LOS		D	C			D			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 94.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 27.1 — Intersection LOS: C
Intersection Capacity Utilization 105.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	2	27	25	1069	5	270	31	526	195	41
Future Volume (veh/h)	11	1	2	27	25	1069	5	270	31	526	195	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	1	1	28	26	230	5	276	32	537	199	42
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	51	26	26	121	113	749	108	351	298	577	1367	283
Arrive On Green	0.03	0.03	0.03	0.13	0.13	0.13	0.07	0.20	0.20	0.36	0.48	0.48
Sat Flow, veh/h	1619	827	827	910	845	1530	1619	1800	1530	1619	2822	584
Grp Volume(v), veh/h	11	0	2	54	0	230	5	276	32	537	119	122
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1696
Q Serve(g_s), s	0.5	0.0	0.1	2.1	0.0	6.7	0.2	10.9	1.3	23.9	2.9	3.0
Cycle Q Clear(g_c), s	0.5	0.0	0.1	2.1	0.0	6.7	0.2	10.9	1.3	23.9	2.9	3.0
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	51	0	52	234	0	749	108	351	298	577	828	821
V/C Ratio(X)	0.21	0.00	0.04	0.23	0.00	0.31	0.05	0.79	0.11	0.93	0.14	0.15
Avail Cap(c_a), veh/h	542	0	553	235	0	750	108	482	409	962	1346	1335
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	0.0	35.1	28.9	0.0	11.5	32.6	28.6	24.7	23.2	10.7	10.7
Incr Delay (d2), s/veh	2.1	0.0	0.3	0.5	0.0	0.2	0.1	5.9	0.2	6.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.0	0.0	2.9	0.1	5.9	0.6	11.6	1.4	1.4
LnGrp Delay(d),s/veh	37.3	0.0	35.4	29.4	0.0	11.7	32.7	34.5	24.9	29.7	10.8	10.8
LnGrp LOS	D		D	C		B	C	C	C	C	B	B
Approach Vol, veh/h		13			284			313			778	
Approach Delay, s/veh		37.0			15.1			33.5			23.8	
Approach LOS		D			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	31.2	20.4		7.0	9.6	42.0		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	25.9	12.9		2.5	2.2	5.0		8.7
Green Ext Time (p_c), s	0.7	1.7		0.0	0.0	3.1		0.1

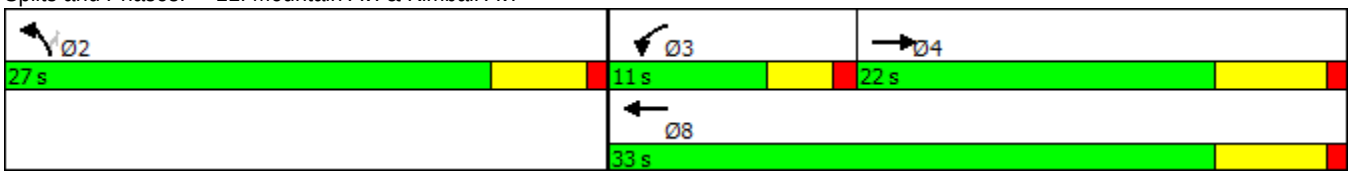
Intersection Summary	
HCM 2010 Ctrl Delay	24.3
HCM 2010 LOS	C

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	482	77	920	244	19
Future Volume (vph)	482	77	920	244	19
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	12.9	7.5	18.4	11.3	11.3
Actuated g/C Ratio	0.31	0.18	0.44	0.27	0.27
v/c Ratio	0.57	0.28	0.64	0.58	0.05
Control Delay	15.8	22.5	11.3	20.7	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	22.5	11.3	20.7	7.2
LOS	B	C	B	C	A
Approach Delay	15.8		12.2	19.7	
Approach LOS	B		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 41.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 51.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	482	90	77	920	244	19
Future Volume (veh/h)	482	90	77	920	244	19
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	502	89	80	958	254	15
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	834	147	170	1700	333	314
Arrive On Green	0.29	0.29	0.11	0.50	0.21	0.21
Sat Flow, veh/h	2997	513	1619	3510	1619	1530
Grp Volume(v), veh/h	294	297	80	958	254	15
Grp Sat Flow(s),veh/h/ln	1710	1709	1619	1710	1619	1530
Q Serve(g_s), s	5.6	5.7	1.8	7.4	5.6	0.3
Cycle Q Clear(g_c), s	5.6	5.7	1.8	7.4	5.6	0.3
Prop In Lane		0.30	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	491	490	170	1700	333	314
V/C Ratio(X)	0.60	0.60	0.47	0.56	0.76	0.05
Avail Cap(c_a), veh/h	720	720	298	2430	925	874
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	11.7	16.0	6.7	14.2	12.1
Incr Delay (d2), s/veh	0.4	0.4	0.7	0.1	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.7	0.8	3.5	2.6	0.1
LnGrp Delay(d),s/veh	12.1	12.1	16.8	6.8	15.6	12.1
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	591			1038	269	
Approach Delay, s/veh	12.1			7.6	15.4	
Approach LOS	B			A	B	

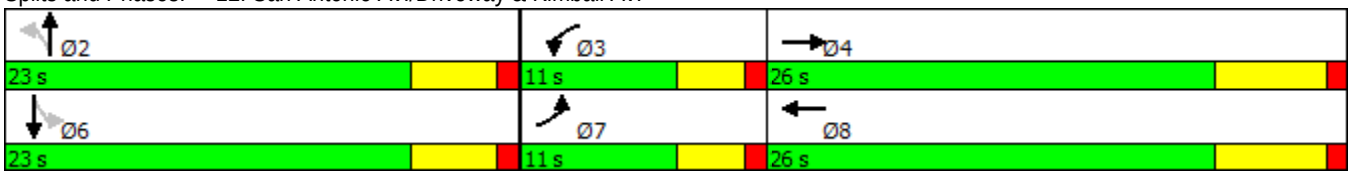
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.1	8.0	16.9				24.9
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		7.6	3.8	7.7				9.4
Green Ext Time (p_c), s		0.2	0.0	3.2				4.4

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	431	35	1002	42	0		
Future Volume (vph)	431	35	1002	42	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	26.0	11.0	26.0	23.0	23.0	23.0	11.0
Total Split (%)	43.3%	18.3%	43.3%	38.3%	38.3%	38%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	16.4	7.3	17.8	8.8	8.8		
Actuated g/C Ratio	0.43	0.19	0.47	0.23	0.23		
v/c Ratio	0.36	0.12	0.67	0.15	0.02		
Control Delay	9.4	17.9	10.5	14.1	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	9.4	17.9	10.5	14.1	0.1		
LOS	A	B	B	B	A		
Approach Delay	9.4		10.7		10.6		
Approach LOS	A		B		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 38.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 47.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	431	56	35	1002	0	42	0	14	0	0	0
Future Volume (veh/h)	0	431	56	35	1002	0	42	0	14	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	459	60	37	1066	0	45	0	12	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	926	120	98	1647	0	537	0	310	209	365	0
Arrive On Green	0.00	0.31	0.31	0.06	0.48	0.00	0.20	0.00	0.20	0.00	0.00	0.00
Sat Flow, veh/h	1619	3036	395	1619	3510	0	1619	0	1530	1345	1800	0
Grp Volume(v), veh/h	0	257	262	37	1066	0	45	0	12	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	0	1619	0	1530	1345	1800	0
Q Serve(g_s), s	0.0	4.3	4.3	0.8	8.1	0.0	0.8	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.3	4.3	0.8	8.1	0.0	0.8	0.0	0.2	0.0	0.0	0.0
Prop In Lane	1.00		0.23	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	5	522	525	98	1647	0	537	0	310	209	365	0
V/C Ratio(X)	0.00	0.49	0.50	0.38	0.65	0.00	0.08	0.00	0.04	0.00	0.00	0.00
Avail Cap(c_a), veh/h	328	991	997	328	1982	0	1058	0	802	641	944	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.8	9.8	15.6	6.7	0.0	11.3	0.0	11.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.0	2.1	0.4	3.8	0.0	0.4	0.0	0.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	10.1	10.1	16.5	7.0	0.0	11.3	0.0	11.1	0.0	0.0	0.0
LnGrp LOS		B	B	B	A		B		B			
Approach Vol, veh/h		519			1103			57			0	
Approach Delay, s/veh		10.1			7.4			11.3			0.0	
Approach LOS		B			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.1	16.5		11.9	0.0	22.6
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		2.8	2.8	6.3		0.0	0.0	10.1
Green Ext Time (p_c), s		0.0	0.0	4.2		0.0	0.0	3.7

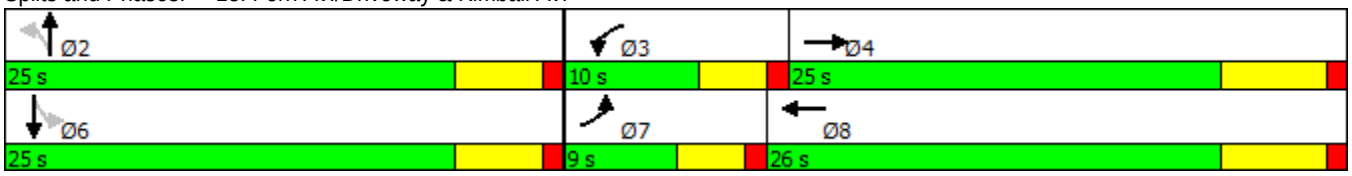
Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	360	37	987	43	0	14	1
Future Volume (vph)	10	360	37	987	43	0	14	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.4	17.3	5.6	17.5	7.5	7.5	7.5	7.5
Actuated g/C Ratio	0.14	0.46	0.15	0.47	0.20	0.20	0.20	0.20
v/c Ratio	0.05	0.30	0.17	0.69	0.19	0.05	0.06	0.01
Control Delay	20.2	8.2	20.4	13.9	15.0	0.1	13.6	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	8.2	20.4	13.9	15.0	0.1	13.6	10.2
LOS	C	A	C	B	B	A	B	B
Approach Delay		8.5		14.1		9.5		12.9
Approach LOS		A		B		A		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 37.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 12.3 — Intersection LOS: B
Intersection Capacity Utilization 52.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	360	64	37	987	3	43	0	25	14	1	3
Future Volume (veh/h)	10	360	64	37	987	3	43	0	25	14	1	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	400	64	41	1097	3	48	0	18	16	1	2
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	23	1128	179	76	1453	4	405	0	223	391	78	156
Arrive On Green	0.01	0.38	0.38	0.05	0.42	0.42	0.15	0.00	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1619	2948	468	1619	3499	10	1356	0	1530	1338	537	1074
Grp Volume(v), veh/h	11	231	233	41	536	564	48	0	18	16	0	3
Grp Sat Flow(s),veh/h/ln	1619	1710	1706	1619	1710	1798	1356	0	1530	1338	0	1611
Q Serve(g_s), s	0.2	3.3	3.4	0.9	9.2	9.2	1.1	0.0	0.3	0.4	0.0	0.1
Cycle Q Clear(g_c), s	0.2	3.3	3.4	0.9	9.2	9.2	1.1	0.0	0.3	0.7	0.0	0.1
Prop In Lane	1.00		0.27	1.00		0.01	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	23	654	653	76	710	747	405	0	223	391	0	234
V/C Ratio(X)	0.47	0.35	0.36	0.54	0.76	0.76	0.12	0.00	0.08	0.04	0.00	0.01
Avail Cap(c_a), veh/h	236	960	958	283	1010	1062	1001	0	895	978	0	942
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.8	7.6	7.6	16.0	8.6	8.6	13.1	0.0	12.7	13.0	0.0	12.6
Incr Delay (d2), s/veh	5.3	0.1	0.1	2.2	1.1	1.0	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.6	1.6	0.4	4.4	4.6	0.4	0.0	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	22.1	7.7	7.7	18.2	9.6	9.6	13.1	0.0	12.8	13.0	0.0	12.6
LnGrp LOS	C	A	A	B	A	A	B		B	B		B
Approach Vol, veh/h		475			1141			66			19	
Approach Delay, s/veh		8.0			9.9			13.0			12.9	
Approach LOS		A			A			B			B	

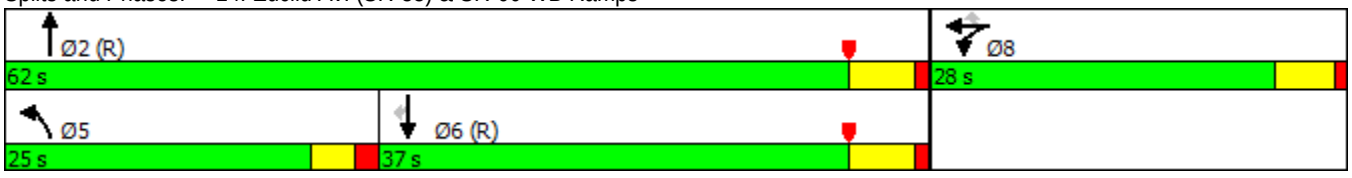
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	5.6	18.8		9.9	4.5	20.0
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.1	2.9	5.4		2.7	2.2	11.2
Green Ext Time (p_c), s		0.1	0.0	3.6		0.1	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.5
HCM 2010 LOS	A

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	604	2	364	296	897	961	461
Future Volume (vph)	604	2	364	296	897	961	461
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	22.5	22.5	22.5	19.6	57.0	33.0	33.0
Actuated g/C Ratio	0.25	0.25	0.25	0.22	0.63	0.37	0.37
v/c Ratio	0.95	0.91	0.70	0.91	0.45	0.83	0.59
Control Delay	69.6	60.6	26.1	49.5	19.0	33.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	1.4	0.0	0.0
Total Delay	69.6	60.6	26.1	49.5	20.5	33.4	5.3
LOS	E	E	C	D	C	C	A
Approach Delay		53.0			27.6	24.3	
Approach LOS		D			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 33.2	Intersection LOS: C
Intersection Capacity Utilization 85.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	604	2	364	296	897	0	0	961	461
Future Volume (veh/h)	0	0	0	604	2	364	296	897	0	0	961	461
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				723	0	158	318	965	0	0	1033	496
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				790	0	373	341	2187	0	0	1296	559
Arrive On Green				0.24	0.00	0.24	0.42	1.00	0.00	0.00	0.38	0.38
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1475
Grp Volume(v), veh/h				723	0	158	318	965	0	0	1033	496
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1475
Q Serve(g_s), s				19.6	0.0	7.8	16.9	0.0	0.0	0.0	24.2	28.3
Cycle Q Clear(g_c), s				19.6	0.0	7.8	16.9	0.0	0.0	0.0	24.2	28.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				790	0	373	341	2187	0	0	1296	559
V/C Ratio(X)				0.92	0.00	0.42	0.93	0.44	0.00	0.00	0.80	0.89
Avail Cap(c_a), veh/h				828	0	391	369	2187	0	0	1296	559
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.59	0.59	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.1	0.0	28.7	25.4	0.0	0.0	0.0	24.9	26.2
Incr Delay (d2), s/veh				13.9	0.0	0.3	19.7	0.4	0.0	0.0	5.2	18.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.3	0.0	3.3	9.3	0.1	0.0	0.0	12.3	14.3
LnGrp Delay(d),s/veh				47.0	0.0	29.0	45.2	0.4	0.0	0.0	30.0	44.8
LnGrp LOS				D		C	D	A			C	D
Approach Vol, veh/h					881			1283			1529	
Approach Delay, s/veh					43.8			11.5			34.8	
Approach LOS					D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		63.1			23.4	39.6		26.9
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			18.9	30.3		21.6
Green Ext Time (p_c), s		39.6			0.1	1.1		0.4

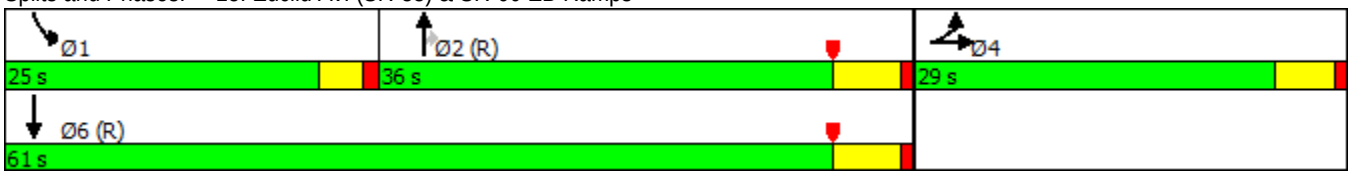
Intersection Summary	
HCM 2010 Ctrl Delay	28.8
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	324	0	869	542	287	1278
Future Volume (vph)	324	0	869	542	287	1278
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	21.8	21.8	34.4	34.4	19.3	57.7
Actuated g/C Ratio	0.24	0.24	0.38	0.38	0.21	0.64
v/c Ratio	0.84	0.92	0.71	0.63	0.88	0.62
Control Delay	52.3	54.6	28.4	5.5	54.2	4.8
Queue Delay	0.2	0.5	0.0	0.0	0.0	0.7
Total Delay	52.5	55.1	28.4	5.5	54.2	5.5
LOS	D	E	C	A	D	A
Approach Delay		54.0	19.6			14.4
Approach LOS		D	B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 23.5	Intersection LOS: C
Intersection Capacity Utilization 85.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	324	0	325	0	0	0	0	869	542	287	1278	0
Future Volume (veh/h)	324	0	325	0	0	0	0	869	542	287	1278	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	304	57	263				0	924	577	305	1360	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	369	64	295				0	1384	616	334	2241	0
Arrive On Green	0.23	0.23	0.23				0.00	0.40	0.40	0.27	0.87	0.00
Sat Flow, veh/h	1619	280	1292				0	3510	1522	1619	3510	0
Grp Volume(v), veh/h	304	0	320				0	924	577	305	1360	0
Grp Sat Flow(s),veh/h/ln	1619	0	1572				0	1710	1522	1619	1710	0
Q Serve(g_s), s	16.1	0.0	17.8				0.0	19.8	32.7	16.4	9.8	0.0
Cycle Q Clear(g_c), s	16.1	0.0	17.8				0.0	19.8	32.7	16.4	9.8	0.0
Prop In Lane	1.00		0.82				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	369	0	359				0	1384	616	334	2241	0
V/C Ratio(X)	0.82	0.00	0.89				0.00	0.67	0.94	0.91	0.61	0.00
Avail Cap(c_a), veh/h	432	0	419				0	1384	616	378	2241	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.84	0.84	0.40	0.40	0.00
Uniform Delay (d), s/veh	33.0	0.0	33.7				0.0	21.8	25.7	31.9	2.6	0.0
Incr Delay (d2), s/veh	9.3	0.0	17.3				0.0	2.2	20.9	11.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	9.5				0.0	9.8	17.2	8.3	4.3	0.0
LnGrp Delay(d),s/veh	42.3	0.0	51.0				0.0	24.0	46.6	43.3	3.1	0.0
LnGrp LOS	D		D					C	D	D	A	
Approach Vol, veh/h		624						1501			1665	
Approach Delay, s/veh		46.8						32.7			10.5	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.5	41.9		25.5		64.5		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	18.4	34.7		19.8		11.8		
Green Ext Time (p_c), s	0.1	0.0		0.8		37.5		

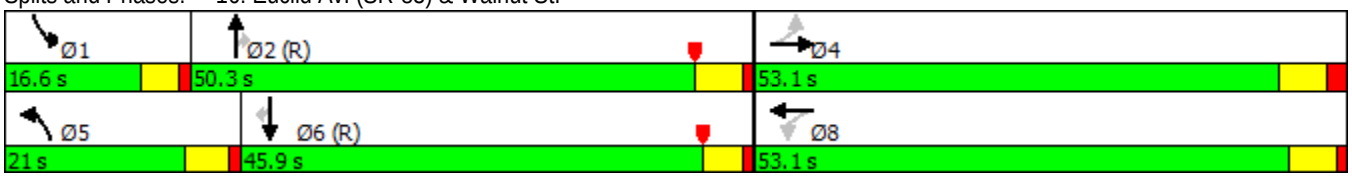
Intersection Summary	
HCM 2010 Ctrl Delay	25.2
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	147	326	81	301	101	1077	49	154	1178	56
Future Volume (vph)	147	326	81	301	101	1077	49	154	1178	56
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.0	33.0	34.0	34.0	12.7	60.4	60.4	10.5	58.6	58.6
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.11	0.50	0.50	0.09	0.49	0.49
v/c Ratio	0.97	0.48	0.45	0.50	0.62	0.46	0.06	0.63	0.52	0.08
Control Delay	106.9	33.2	39.8	28.1	67.2	12.6	5.2	64.0	24.6	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.9	33.2	39.8	28.1	67.2	12.6	5.2	64.0	24.6	4.7
LOS	F	C	D	C	E	B	A	E	C	A
Approach Delay		52.2		29.8		16.8			28.1	
Approach LOS		D		C		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 72.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	326	99	81	301	168	101	1077	49	154	1178	56
Future Volume (veh/h)	147	326	99	81	301	168	101	1077	49	154	1178	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	155	343	82	85	317	144	106	1134	33	162	1240	30
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	257	911	215	277	760	337	130	2277	709	210	2215	689
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.03	0.15	0.15	0.07	0.45	0.45
Sat Flow, veh/h	892	2747	648	923	2292	1017	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	155	212	213	85	235	226	106	1134	33	162	1240	30
Grp Sat Flow(s),veh/h/ln	892	1710	1685	923	1710	1600	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	19.7	11.3	11.6	9.3	12.8	13.2	7.8	25.4	2.2	6.5	22.2	1.3
Cycle Q Clear(g_c), s	32.9	11.3	11.6	20.9	12.8	13.2	7.8	25.4	2.2	6.5	22.2	1.3
Prop In Lane	1.00		0.38	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	257	567	559	277	567	530	130	2277	709	210	2215	689
V/C Ratio(X)	0.60	0.37	0.38	0.31	0.41	0.43	0.82	0.50	0.05	0.77	0.56	0.04
Avail Cap(c_a), veh/h	310	667	657	338	681	637	217	2277	709	298	2215	689
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.57	0.57	0.57	0.75	0.75	0.75
Uniform Delay (d), s/veh	44.0	30.6	30.7	38.7	31.1	31.2	57.5	38.0	28.2	54.8	24.2	18.5
Incr Delay (d2), s/veh	2.3	0.4	0.4	0.6	0.5	0.5	6.9	0.4	0.1	3.4	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	5.4	5.5	2.4	6.1	5.9	3.8	11.6	1.0	2.7	10.1	0.6
LnGrp Delay(d),s/veh	46.3	31.0	31.1	39.3	31.6	31.8	64.5	38.5	28.3	58.2	25.0	18.6
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	C	B
Approach Vol, veh/h		580			546			1273			1432	
Approach Delay, s/veh		35.1			32.9			40.4			28.6	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	60.9		46.1	14.5	59.4		46.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	8.5	27.4		34.9	9.8	24.2		22.9
Green Ext Time (p_c), s	0.1	12.4		4.9	0.1	12.1		6.7

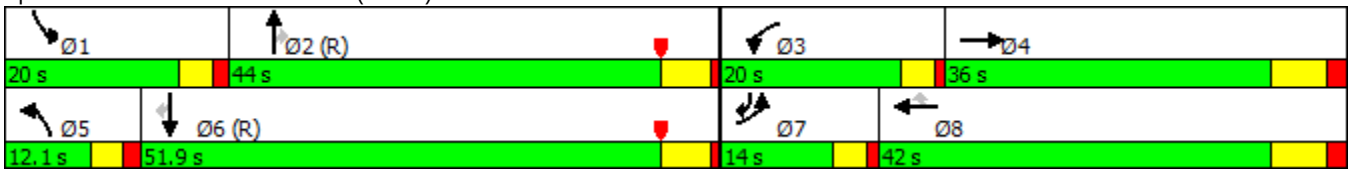
Intersection Summary		
HCM 2010 Ctrl Delay		34.1
HCM 2010 LOS		C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	318	171	373	49	61	937	166	175	1045	145
Future Volume (vph)	139	318	171	373	49	61	937	166	175	1045	145
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	36.0	20.0	42.0	42.0	12.1	44.0	44.0	20.0	51.9	14.0
Total Split (%)	11.7%	30.0%	16.7%	35.0%	35.0%	10.1%	36.7%	36.7%	16.7%	43.3%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.2	21.6	15.3	24.7	24.7	9.5	43.4	43.4	18.7	54.8	72.6
Actuated g/C Ratio	0.10	0.18	0.13	0.21	0.21	0.08	0.36	0.36	0.16	0.46	0.60
v/c Ratio	0.89	0.64	0.87	0.56	0.12	0.50	0.80	0.26	0.73	0.70	0.16
Control Delay	100.5	48.6	88.6	45.1	0.6	76.3	36.5	6.3	69.7	17.6	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.5	48.6	88.6	45.1	0.6	76.3	36.5	6.3	69.7	17.6	2.2
LOS	F	D	F	D	A	E	D	A	E	B	A
Approach Delay		62.8		53.9			34.3			22.6	
Approach LOS		E		D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 37.1	Intersection LOS: D
Intersection Capacity Utilization 77.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	318	52	171	373	49	61	937	166	175	1045	145
Future Volume (veh/h)	139	318	52	171	373	49	61	937	166	175	1045	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	146	335	32	180	393	47	64	986	94	184	1100	87
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	516	49	204	705	315	80	1399	626	205	1663	871
Arrive On Green	0.08	0.16	0.16	0.13	0.21	0.21	0.07	0.54	0.54	0.25	0.97	0.97
Sat Flow, veh/h	1619	3153	299	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	146	181	186	180	393	47	64	986	94	184	1100	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1742	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	10.0	11.9	12.0	13.1	12.4	3.0	4.7	25.6	3.7	13.2	3.0	0.2
Cycle Q Clear(g_c), s	10.0	11.9	12.0	13.1	12.4	3.0	4.7	25.6	3.7	13.2	3.0	0.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	280	285	204	705	315	80	1399	626	205	1663	871
V/C Ratio(X)	1.08	0.65	0.65	0.88	0.56	0.15	0.80	0.70	0.15	0.90	0.66	0.10
Avail Cap(c_a), veh/h	135	413	421	216	998	446	103	1399	626	209	1663	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.85	0.85	0.85	0.85	0.85
Uniform Delay (d), s/veh	55.0	46.9	47.0	51.6	42.7	39.0	55.5	22.0	17.0	44.1	0.9	0.6
Incr Delay (d2), s/veh	101.2	3.5	3.6	29.7	1.0	0.3	25.3	2.6	0.4	31.7	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	5.9	6.1	7.5	5.9	1.3	2.6	12.4	1.6	7.6	1.0	0.1
LnGrp Delay(d),s/veh	156.2	50.4	50.6	81.2	43.7	39.3	80.8	24.6	17.4	75.8	2.7	0.8
LnGrp LOS	F	D	D	F	D	D	F	C	B	E	A	A
Approach Vol, veh/h		513			620			1144			1371	
Approach Delay, s/veh		80.6			54.3			27.1			12.4	
Approach LOS		F			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	54.6	19.1	26.6	10.4	63.9	14.0	31.8
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	38.5	16.0	29.0	7.6	46.4	10.0	35.0
Max Q Clear Time (g_c+I1), s	15.2	27.6	15.1	14.0	6.7	5.0	12.0	14.4
Green Ext Time (p_c), s	0.0	8.6	0.0	5.4	0.0	21.6	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	97	119	48	60	155	56	1008	131	28	1134	95
Future Volume (vph)	97	119	48	60	155	56	1008	131	28	1134	95
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	25.0	25.0	25.0		25.0	8.8	75.2	75.2	6.8	71.4	71.4
Actuated g/C Ratio	0.21	0.21	0.21		0.21	0.07	0.63	0.63	0.06	0.60	0.60
v/c Ratio	0.67	0.33	0.13		0.80	0.50	0.50	0.14	0.32	0.59	0.11
Control Delay	63.6	41.3	1.9		61.6	78.4	9.3	2.0	43.9	32.1	13.5
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	41.3	1.9		61.6	78.4	9.3	2.0	43.9	32.1	13.5
LOS	E	D	A		E	E	A	A	D	C	B
Approach Delay		42.2			61.6		11.7			30.9	
Approach LOS		D			E		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 26.8	Intersection LOS: C
Intersection Capacity Utilization 72.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	119	48	60	155	35	56	1008	131	28	1134	95
Future Volume (veh/h)	97	119	48	60	155	35	56	1008	131	28	1134	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	102	125	27	63	163	33	59	1061	102	29	1194	71
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	197	386	324	98	215	40	73	2127	952	42	2061	921
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.09	1.00	1.00	0.01	0.20	0.20
Sat Flow, veh/h	1139	1800	1510	282	1000	187	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	102	125	27	259	0	0	59	1061	102	29	1194	71
Grp Sat Flow(s),veh/h/ln	1139	1800	1510	1470	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	1.0	7.0	1.7	13.7	0.0	0.0	4.3	0.0	0.0	2.1	37.9	4.5
Cycle Q Clear(g_c), s	21.7	7.0	1.7	20.7	0.0	0.0	4.3	0.0	0.0	2.1	37.9	4.5
Prop In Lane	1.00		1.00	0.24		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	386	324	353	0	0	73	2127	952	42	2061	921
V/C Ratio(X)	0.52	0.32	0.08	0.73	0.00	0.00	0.81	0.50	0.11	0.69	0.58	0.08
Avail Cap(c_a), veh/h	304	555	466	502	0	0	169	2127	952	101	2061	921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.77	0.77	0.77	0.63	0.63	0.63
Uniform Delay (d), s/veh	46.0	39.8	37.7	45.5	0.0	0.0	54.1	0.0	0.0	59.0	34.3	20.9
Incr Delay (d2), s/veh	2.1	0.5	0.1	3.3	0.0	0.0	5.9	0.6	0.2	4.8	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.6	0.7	8.5	0.0	0.0	2.0	0.2	0.0	1.0	18.2	2.0
LnGrp Delay(d),s/veh	48.1	40.2	37.8	48.8	0.0	0.0	59.9	0.6	0.2	63.8	35.1	21.0
LnGrp LOS	D	D	D	D			E	A	A	E	D	C
Approach Vol, veh/h		254			259			1222			1294	
Approach Delay, s/veh		43.1			48.8			3.5			34.9	
Approach LOS		D			D			A			C	

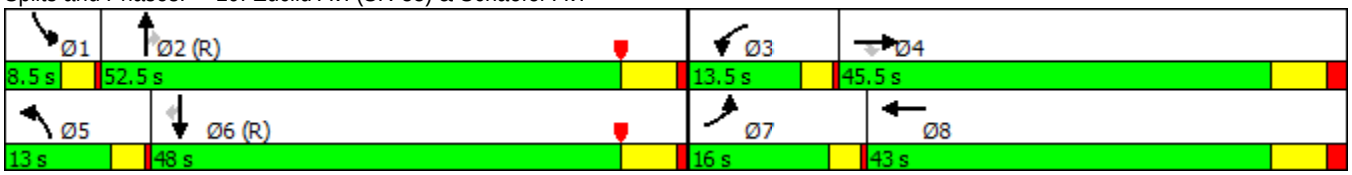
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	80.6		32.8	8.9	78.3		32.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.1	2.0		23.7	6.3	39.9		22.7
Green Ext Time (p_c), s	0.0	27.0		2.1	0.0	11.0		2.2

Intersection Summary		
HCM 2010 Ctrl Delay		24.1
HCM 2010 LOS		C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	134	59	83	52	114	95	1069	18	14	1074	127
Future Volume (vph)	134	59	83	52	114	95	1069	18	14	1074	127
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.4	22.4	22.4	10.0	17.2	11.2	70.2	70.2	5.4	59.2	59.2
Actuated g/C Ratio	0.10	0.19	0.19	0.08	0.14	0.09	0.58	0.58	0.04	0.49	0.49
v/c Ratio	0.86	0.19	0.23	0.41	0.54	0.67	0.57	0.02	0.21	0.68	0.17
Control Delay	93.4	40.7	3.4	62.0	51.0	57.1	27.3	0.9	45.9	40.3	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	40.7	3.4	62.0	51.0	57.1	27.3	0.9	45.9	40.3	16.2
LOS	F	D	A	E	D	E	C	A	D	D	B
Approach Delay		55.1			54.1		29.3			37.9	
Approach LOS		E			D		C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 37.0	Intersection LOS: D
Intersection Capacity Utilization 70.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	59	83	52	114	17	95	1069	18	14	1074	127
Future Volume (veh/h)	134	59	83	52	114	17	95	1069	18	14	1074	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	143	63	36	55	121	16	101	1137	14	15	1143	87
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	166	238	202	113	155	20	123	2102	941	27	1899	830
Arrive On Green	0.10	0.13	0.13	0.07	0.10	0.10	0.05	0.41	0.41	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1558	206	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	143	63	36	55	0	137	101	1137	14	15	1143	87
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	10.4	3.8	2.5	3.9	0.0	9.1	7.4	30.2	0.6	1.1	36.8	5.8
Cycle Q Clear(g_c), s	10.4	3.8	2.5	3.9	0.0	9.1	7.4	30.2	0.6	1.1	36.8	5.8
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	166	238	202	113	0	175	123	2102	941	27	1899	830
V/C Ratio(X)	0.86	0.26	0.18	0.49	0.00	0.78	0.82	0.54	0.01	0.57	0.60	0.10
Avail Cap(c_a), veh/h	169	578	491	135	0	529	128	2102	941	67	1899	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.67	0.67	0.67	0.80	0.80	0.80
Uniform Delay (d), s/veh	53.0	46.8	46.3	53.7	0.0	52.8	56.2	22.5	13.8	59.2	36.8	24.2
Incr Delay (d2), s/veh	31.8	0.4	0.3	1.2	0.0	5.5	21.9	0.7	0.0	5.5	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	1.9	1.1	1.8	0.0	4.7	4.1	14.5	0.3	0.5	17.8	2.5
LnGrp Delay(d),s/veh	84.8	47.3	46.6	54.9	0.0	58.3	78.1	23.1	13.8	64.7	38.0	24.4
LnGrp LOS	F	D	D	D		E	E	C	B	E	D	C
Approach Vol, veh/h		242			192			1252			1245	
Approach Delay, s/veh		69.3			57.3			27.5			37.3	
Approach LOS		E			E			C			D	

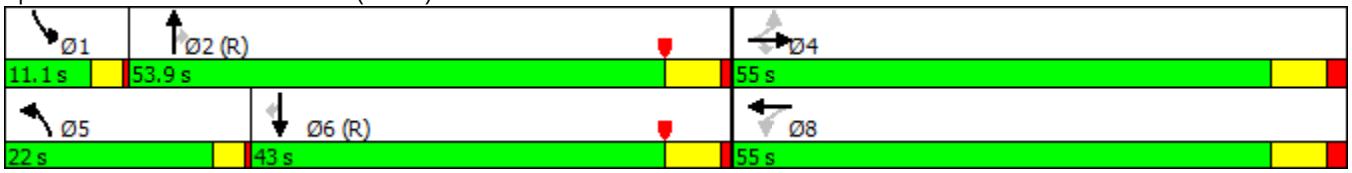
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	79.8	11.9	22.9	12.6	72.6	15.8	18.9
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.1	32.2	5.9	5.8	9.4	38.8	12.4	11.1
Green Ext Time (p_c), s	0.0	11.1	0.0	0.9	0.0	2.9	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	37.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	206	158	149	62	328	184	906	33	39	891	237
Future Volume (vph)	206	158	149	62	328	184	906	33	39	891	237
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.0	43.0	43.0	43.0	43.0	17.0	55.5	55.5	6.7	43.5	43.5
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.14	0.46	0.46	0.06	0.36	0.36
v/c Ratio	1.01	0.26	0.24	0.17	0.61	0.86	0.61	0.05	0.46	0.76	0.38
Control Delay	102.3	27.1	4.5	25.4	34.7	68.0	34.2	7.1	92.6	21.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.3	27.1	4.5	25.4	34.7	68.0	34.2	7.1	92.6	21.2	4.8
LOS	F	C	A	C	C	E	C	A	F	C	A
Approach Delay		50.7			33.4		38.9			20.3	
Approach LOS		D			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 33.3	Intersection LOS: C
Intersection Capacity Utilization 93.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	158	149	62	328	38	184	906	33	39	891	237
Future Volume (veh/h)	206	158	149	62	328	38	184	906	33	39	891	237
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	219	168	92	66	349	38	196	964	20	41	948	221
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	282	720	612	423	638	69	220	1475	660	50	1117	499
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.14	0.43	0.43	0.06	0.65	0.65
Sat Flow, veh/h	956	1800	1530	1074	1595	174	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	219	168	92	66	0	387	196	964	20	41	948	221
Grp Sat Flow(s),veh/h/ln	956	1800	1530	1074	0	1769	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	27.4	7.4	4.6	5.2	0.0	20.2	14.3	26.8	0.9	3.0	25.9	8.5
Cycle Q Clear(g_c), s	47.6	7.4	4.6	12.6	0.0	20.2	14.3	26.8	0.9	3.0	25.9	8.5
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	282	720	612	423	0	708	220	1475	660	50	1117	499
V/C Ratio(X)	0.78	0.23	0.15	0.16	0.00	0.55	0.89	0.65	0.03	0.81	0.85	0.44
Avail Cap(c_a), veh/h	282	720	612	423	0	708	250	1475	660	103	1117	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.90	0.90	0.90	0.73	0.73	0.73
Uniform Delay (d), s/veh	45.9	23.8	23.0	28.0	0.0	27.6	51.0	27.0	19.7	55.9	18.5	15.5
Incr Delay (d2), s/veh	12.9	0.2	0.1	0.2	0.0	0.9	24.3	2.1	0.1	8.4	6.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	3.7	2.0	1.6	0.0	10.0	7.9	13.0	0.4	1.5	12.8	3.7
LnGrp Delay(d),s/veh	58.8	24.0	23.1	28.2	0.0	28.5	75.3	29.1	19.7	64.3	24.6	17.6
LnGrp LOS	E	C	C	C		C	E	C	B	E	C	B
Approach Vol, veh/h		479			453			1180			1210	
Approach Delay, s/veh		39.7			28.5			36.6			24.6	
Approach LOS		D			C			D			C	

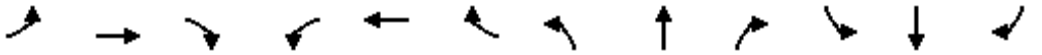
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	57.8		55.0	19.8	45.2		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.0	28.8		49.6	16.3	27.9		22.2
Green Ext Time (p_c), s	0.0	12.3		0.0	0.1	7.0		5.1

Intersection Summary	
HCM 2010 Ctrl Delay	31.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	52	7	134	17	43	130	1048	5	21	1048	26
Future Volume (vph)	52	7	134	17	43	130	1048	5	21	1048	26
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	21.0	63.5	63.5	9.7	52.2	52.2
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	17.5%	52.9%	52.9%	8.1%	43.5%	43.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.6	15.6	15.6	15.6	15.6	14.1	87.7	87.7	6.2	76.3	76.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.12	0.73	0.73	0.05	0.64	0.64
v/c Ratio	0.35	0.03	0.44	0.11	0.31	0.71	0.44	0.00	0.27	0.50	0.03
Control Delay	48.6	36.7	9.9	40.3	28.9	74.0	6.0	0.0	73.7	7.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	36.7	9.9	40.3	28.9	74.0	6.0	0.0	73.7	7.5	1.1
LOS	D	D	A	D	C	E	A	A	E	A	A
Approach Delay		21.2			31.1		13.5			8.6	
Approach LOS		C			C		B			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	7	134	17	43	30	130	1048	5	21	1048	26
Future Volume (veh/h)	52	7	134	17	43	30	130	1048	5	21	1048	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	7	54	18	45	24	135	1092	5	22	1092	23
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	140	182	154	185	112	59	159	2602	1164	35	2340	1024
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.76	0.76	0.01	0.23	0.23
Sat Flow, veh/h	1278	1800	1530	1287	1106	590	1619	3420	1530	1619	3420	1497
Grp Volume(v), veh/h	54	7	54	18	0	69	135	1092	5	22	1092	23
Grp Sat Flow(s),veh/h/ln	1278	1800	1530	1287	0	1696	1619	1710	1530	1619	1710	1497
Q Serve(g_s), s	5.0	0.4	3.9	1.5	0.0	4.6	9.8	13.5	0.1	1.6	33.2	1.4
Cycle Q Clear(g_c), s	9.5	0.4	3.9	2.0	0.0	4.6	9.8	13.5	0.1	1.6	33.2	1.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	182	154	185	0	171	159	2602	1164	35	2340	1024
V/C Ratio(X)	0.39	0.04	0.35	0.10	0.00	0.40	0.85	0.42	0.00	0.63	0.47	0.02
Avail Cap(c_a), veh/h	458	630	535	506	0	594	236	2602	1164	84	2340	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.70	0.70	0.70
Uniform Delay (d), s/veh	55.0	48.7	50.3	49.6	0.0	50.6	53.2	5.0	3.4	59.1	27.5	15.2
Incr Delay (d2), s/veh	1.3	0.1	1.0	0.2	0.0	1.1	14.5	0.5	0.0	9.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.2	1.7	0.6	0.0	2.2	5.0	6.4	0.0	0.8	15.9	0.6
LnGrp Delay(d),s/veh	56.3	48.8	51.3	49.7	0.0	51.7	67.7	5.5	3.4	68.3	28.0	15.3
LnGrp LOS	E	D	D	D		D	E	A	A	E	C	B
Approach Vol, veh/h		115			87			1232			1137	
Approach Delay, s/veh		53.5			51.3			12.3			28.5	
Approach LOS		D			D			B			C	

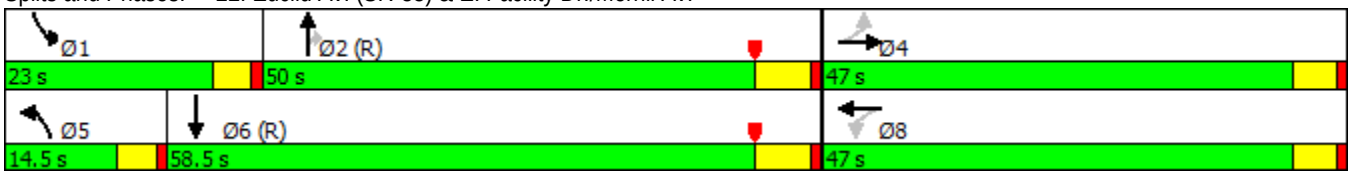
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	97.0		16.9	15.3	87.8		16.9
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	57.8		42.0	17.5	46.5		42.0
Max Q Clear Time (g_c+I1), s	3.6	15.5		11.5	11.8	35.2		6.6
Green Ext Time (p_c), s	0.0	21.4		0.6	0.1	8.8		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	22.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	162	46	19	974	105	165	1018
Future Volume (vph)	8	6	162	46	19	974	105	165	1018
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		35.8		35.8	10.0	52.7	52.7	15.9	67.4
Actuated g/C Ratio		0.30		0.30	0.08	0.44	0.44	0.13	0.56
v/c Ratio		0.04		0.91	0.15	0.68	0.15	0.80	0.58
Control Delay		22.6		60.2	56.4	20.7	2.8	66.0	18.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.6		60.2	56.4	20.7	2.8	66.0	18.4
LOS		C		E	E	C	A	E	B
Approach Delay		22.6		60.2		19.6			24.8
Approach LOS		C		E		B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 82.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	162	46	191	19	974	105	165	1018	42
Future Volume (veh/h)	8	6	4	162	46	191	19	974	105	165	1018	42
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	169	48	153	20	1015	83	172	1060	41
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	182	131	58	223	55	166	66	1655	740	196	1896	73
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.04	0.48	0.48	0.12	0.56	0.56
Sat Flow, veh/h	521	492	217	677	207	623	1619	3420	1530	1619	3357	130
Grp Volume(v), veh/h	17	0	0	370	0	0	20	1015	83	172	540	561
Grp Sat Flow(s),veh/h/ln	1230	0	0	1507	0	0	1619	1710	1530	1619	1710	1777
Q Serve(g_s), s	0.0	0.0	0.0	27.8	0.0	0.0	1.4	26.1	3.6	12.5	24.1	24.1
Cycle Q Clear(g_c), s	0.9	0.0	0.0	28.7	0.0	0.0	1.4	26.1	3.6	12.5	24.1	24.1
Prop In Lane	0.47		0.18	0.46		0.41	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	371	0	0	444	0	0	66	1655	740	196	966	1004
V/C Ratio(X)	0.05	0.00	0.00	0.83	0.00	0.00	0.30	0.61	0.11	0.88	0.56	0.56
Avail Cap(c_a), veh/h	491	0	0	571	0	0	135	1655	740	250	966	1004
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	0.0	42.8	0.0	0.0	55.9	22.7	16.9	51.8	16.6	16.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	6.6	0.0	0.0	0.6	1.1	0.2	20.3	2.3	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	12.7	0.0	0.0	0.7	12.5	1.5	6.7	11.9	12.3
LnGrp Delay(d),s/veh	32.7	0.0	0.0	49.4	0.0	0.0	56.5	23.8	17.1	72.1	18.9	18.9
LnGrp LOS	C			D			E	C	B	E	B	B
Approach Vol, veh/h		17			370			1118			1273	
Approach Delay, s/veh		32.7			49.4			23.9			26.1	
Approach LOS		C			D			C			C	

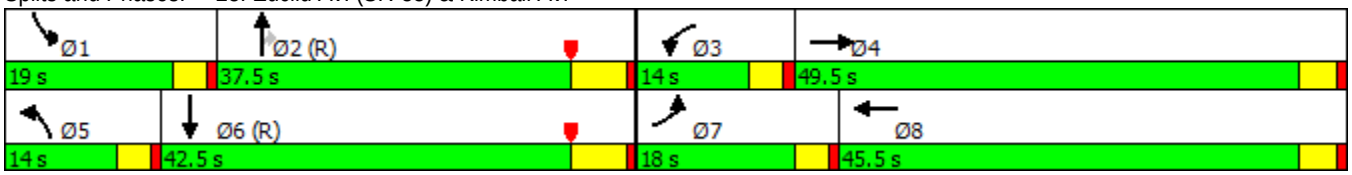
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.1	64.1		36.9	9.4	73.8		36.9
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	14.5	28.1		2.9	3.4	26.1		30.7
Green Ext Time (p_c), s	0.1	11.0		1.4	0.0	15.4		1.1

Intersection Summary		
HCM 2010 Ctrl Delay		28.3
HCM 2010 LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	135	252	30	639	97	651	34	206	593
Future Volume (vph)	135	252	30	639	97	651	34	206	593
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	12.9	45.1	10.0	36.6	10.7	33.1	33.1	18.9	41.3
Actuated g/C Ratio	0.11	0.38	0.08	0.30	0.09	0.28	0.28	0.16	0.34
v/c Ratio	0.80	0.22	0.23	0.89	0.69	0.70	0.07	0.83	0.79
Control Delay	82.9	25.3	56.0	48.6	61.6	45.0	4.2	71.6	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.9	25.3	56.0	48.6	61.6	45.0	4.2	71.6	26.3
LOS	F	C	E	D	E	D	A	E	C
Approach Delay		44.1		48.8		45.3			34.7
Approach LOS		D		D		D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 42.6	Intersection LOS: D
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	252	25	30	639	266	97	651	34	206	593	310
Future Volume (veh/h)	135	252	25	30	639	266	97	651	34	206	593	310
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	138	257	24	31	652	249	99	664	27	210	605	278
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	1097	102	87	728	278	130	1096	490	202	829	380
Arrive On Green	0.10	0.35	0.35	0.05	0.30	0.30	0.03	0.11	0.11	0.13	0.37	0.37
Sat Flow, veh/h	1619	3165	293	1619	2422	925	1619	3420	1530	1619	2269	1042
Grp Volume(v), veh/h	138	138	143	31	460	441	99	664	27	210	456	427
Grp Sat Flow(s),veh/h/ln	1619	1710	1748	1619	1710	1637	1619	1710	1530	1619	1710	1601
Q Serve(g_s), s	10.1	6.9	7.0	2.2	30.9	30.9	7.3	22.3	1.9	15.0	27.7	27.7
Cycle Q Clear(g_c), s	10.1	6.9	7.0	2.2	30.9	30.9	7.3	22.3	1.9	15.0	27.7	27.7
Prop In Lane	1.00		0.17	1.00		0.56	1.00		1.00	1.00		0.65
Lane Grp Cap(c), veh/h	162	593	606	87	514	492	130	1096	490	202	625	585
V/C Ratio(X)	0.85	0.23	0.24	0.36	0.90	0.90	0.76	0.61	0.06	1.04	0.73	0.73
Avail Cap(c_a), veh/h	189	641	656	135	584	559	135	1096	490	202	625	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	1.00	1.00	1.00	0.88	0.88	0.88	0.79	0.79	0.79
Uniform Delay (d), s/veh	53.2	27.9	27.9	54.8	40.2	40.2	57.3	46.4	37.3	52.5	33.0	33.0
Incr Delay (d2), s/veh	23.4	0.2	0.2	0.9	14.1	14.6	17.2	2.2	0.2	66.4	5.9	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	3.3	3.4	1.0	16.6	16.0	3.9	10.9	0.8	10.4	14.1	13.2
LnGrp Delay(d),s/veh	76.6	28.1	28.1	55.7	54.2	54.8	74.4	48.6	37.5	119.0	38.8	39.3
LnGrp LOS	E	C	C	E	D	D	E	D	D	F	D	D
Approach Vol, veh/h		419			932			790			1093	
Approach Delay, s/veh		44.0			54.6			51.5			54.4	
Approach LOS		D			D			D			D	

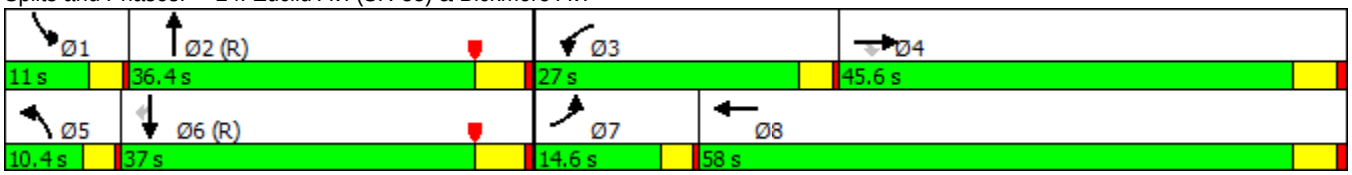
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	44.5	10.4	46.1	13.6	49.8	16.0	40.6
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	24.3	4.2	9.0	9.3	29.7	12.1	32.9
Green Ext Time (p_c), s	0.0	4.7	0.0	5.1	0.0	4.4	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	52.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	65	18	24	184	365	29	520	41	502	74
Future Volume (vph)	65	18	24	184	365	29	520	41	502	74
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.0	24.9	24.9	30.2	43.9	6.4	46.0	7.1	48.5	48.5
Actuated g/C Ratio	0.08	0.21	0.21	0.25	0.37	0.05	0.38	0.06	0.40	0.40
v/c Ratio	0.57	0.05	0.06	0.48	0.88	0.36	0.46	0.46	0.39	0.12
Control Delay	71.8	29.7	0.3	45.9	49.8	45.4	17.9	73.2	11.5	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	29.7	0.3	45.9	49.8	45.4	17.9	73.2	11.5	3.6
LOS	E	C	A	D	D	D	B	E	B	A
Approach Delay		48.5			48.8		19.3		14.7	
Approach LOS		D			D		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 29.9	Intersection LOS: C
Intersection Capacity Utilization 71.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	18	24	184	365	170	29	520	39	41	502	74
Future Volume (veh/h)	65	18	24	184	365	170	29	520	39	41	502	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	69	19	24	196	388	168	31	553	40	44	534	70
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	86	476	404	221	415	180	43	1357	98	55	1458	652
Arrive On Green	0.05	0.26	0.26	0.14	0.35	0.35	0.01	0.14	0.14	0.01	0.14	0.14
Sat Flow, veh/h	1619	1800	1528	1619	1193	516	1619	3235	234	1619	3420	1530
Grp Volume(v), veh/h	69	19	24	196	0	556	31	292	301	44	534	70
Grp Sat Flow(s),veh/h/ln	1619	1800	1528	1619	0	1709	1619	1710	1759	1619	1710	1530
Q Serve(g_s), s	5.1	0.9	1.4	14.3	0.0	37.7	2.3	18.7	18.8	3.3	17.0	4.8
Cycle Q Clear(g_c), s	5.1	0.9	1.4	14.3	0.0	37.7	2.3	18.7	18.8	3.3	17.0	4.8
Prop In Lane	1.00		1.00	1.00		0.30	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	86	476	404	221	0	594	43	717	738	55	1458	652
V/C Ratio(X)	0.80	0.04	0.06	0.89	0.00	0.94	0.71	0.41	0.41	0.81	0.37	0.11
Avail Cap(c_a), veh/h	150	609	517	317	0	755	93	717	738	101	1458	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	0.55	0.55	0.55
Uniform Delay (d), s/veh	56.2	32.8	33.0	50.9	0.0	37.8	59.0	38.1	38.1	58.9	36.9	31.6
Incr Delay (d2), s/veh	6.4	0.0	0.0	14.6	0.0	14.9	6.0	1.3	1.3	5.6	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.5	0.6	7.3	0.0	20.2	1.1	9.1	9.4	1.5	8.1	2.1
LnGrp Delay(d),s/veh	62.6	32.8	33.0	65.5	0.0	52.8	65.0	39.4	39.4	64.6	37.3	31.8
LnGrp LOS	E	C	C	E		D	E	D	D	E	D	C
Approach Vol, veh/h		112			752			624			648	
Approach Delay, s/veh		51.2			56.1			40.6			38.5	
Approach LOS		D			E			D			D	

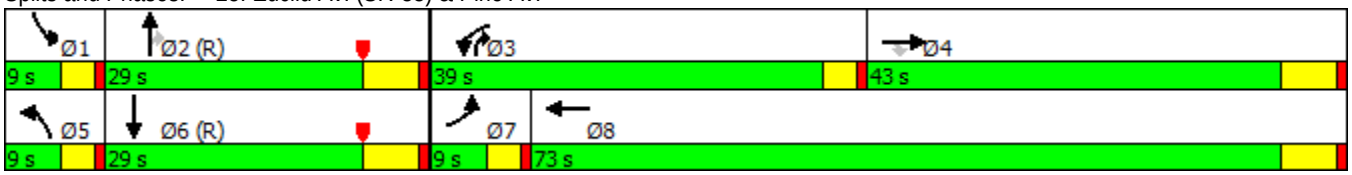
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	55.8	19.9	36.7	6.7	56.7	9.9	46.7
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	5.3	20.8	16.3	3.4	4.3	19.0	7.1	39.7
Green Ext Time (p_c), s	0.0	3.1	0.1	2.4	0.0	3.4	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	46.0
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	208	32	841	159	56	595	470	58	631
Future Volume (vph)	5	208	32	841	159	56	595	470	58	631
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	22.3	22.3	35.0	59.5	8.2	34.3	71.3	8.4	34.5
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.29	0.59	0.07	0.29
v/c Ratio	0.07	0.63	0.08	0.99	0.26	0.52	0.62	0.44	0.52	0.66
Control Delay	57.8	52.2	0.4	70.3	15.3	77.4	39.3	2.1	56.7	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.2	0.4	70.3	15.3	77.4	39.3	2.1	56.7	32.8
LOS	E	D	A	E	B	E	D	A	E	C
Approach Delay		45.6			58.8		25.7			34.7
Approach LOS		D			E		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 40.5	Intersection LOS: D
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	208	32	841	159	64	56	595	470	58	631	14
Future Volume (veh/h)	5	208	32	841	159	64	56	595	470	58	631	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	210	0	849	161	50	57	601	297	59	637	9
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	278	236	862	578	179	67	1182	963	67	1193	17
Arrive On Green	0.01	0.15	0.00	0.29	0.44	0.44	0.04	0.35	0.35	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1314	408	1619	3420	1496	1619	3451	49
Grp Volume(v), veh/h	5	210	0	849	0	211	57	601	297	59	316	330
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1722	1619	1710	1496	1619	1710	1790
Q Serve(g_s), s	0.4	13.4	0.0	34.2	0.0	9.4	4.2	16.7	10.8	4.4	20.9	20.9
Cycle Q Clear(g_c), s	0.4	13.4	0.0	34.2	0.0	9.4	4.2	16.7	10.8	4.4	20.9	20.9
Prop In Lane	1.00		1.00	1.00		0.24	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	278	236	862	0	757	67	1182	963	67	591	619
V/C Ratio(X)	0.48	0.76	0.00	0.98	0.00	0.28	0.84	0.51	0.31	0.87	0.53	0.53
Avail Cap(c_a), veh/h	67	555	472	862	0	961	67	1182	963	67	591	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.70	0.70	0.70	0.92	0.92	0.92
Uniform Delay (d), s/veh	59.4	48.6	0.0	42.2	0.0	21.5	57.1	31.2	9.8	58.9	44.0	44.0
Incr Delay (d2), s/veh	12.4	5.9	0.0	26.7	0.0	0.3	44.7	1.1	0.6	62.6	3.2	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.1	0.0	17.1	0.0	4.5	2.7	8.1	4.6	3.1	10.4	10.9
LnGrp Delay(d),s/veh	71.8	54.4	0.0	69.0	0.0	21.8	101.8	32.3	10.4	121.4	47.2	47.1
LnGrp LOS	E	D		E		C	F	C	B	F	D	D
Approach Vol, veh/h		215			1060			955			705	
Approach Delay, s/veh		54.8			59.6			29.6			53.4	
Approach LOS		D			E			C			D	

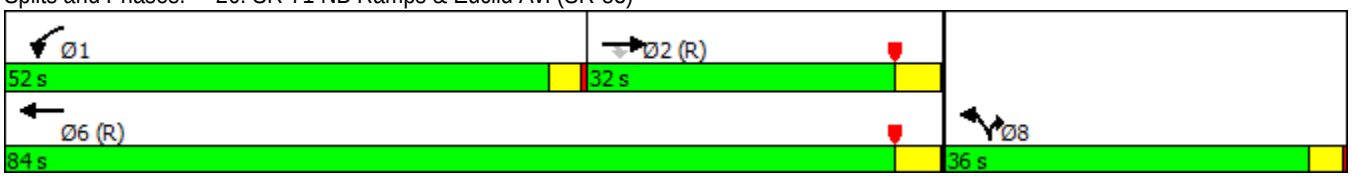
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	47.5	39.0	24.5	9.0	47.5	4.8	58.8
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	6.4	18.7	36.2	15.4	6.2	22.9	2.4	11.4
Green Ext Time (p_c), s	0.0	2.2	0.0	3.1	0.0	0.1	0.0	3.7

Intersection Summary	
HCM 2010 Ctrl Delay	48.0
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	485	289	552	942	69	669
Future Volume (vph)	485	289	552	942	69	669
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	32.0	32.0	52.0	84.0	36.0	36.0
Total Split (%)	26.7%	26.7%	43.3%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	50.1	50.1	44.1	97.7	14.3	14.3
Actuated g/C Ratio	0.42	0.42	0.37	0.81	0.12	0.12
v/c Ratio	0.35	0.37	0.92	0.35	0.18	0.88
Control Delay	47.2	23.6	48.7	0.3	44.8	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	23.6	48.7	0.3	44.8	16.2
LOS	D	C	D	A	D	B
Approach Delay	38.4			18.2	18.9	
Approach LOS	D			B	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	485	289	552	942	69	669
Future Volume (veh/h)	485	289	552	942	69	669
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	505	0	575	981	72	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1753	784	600	3050	139	64
Arrive On Green	0.68	0.00	0.35	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	505	0	575	981	72	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	7.0	0.0	39.4	5.2	2.5	0.0
Cycle Q Clear(g_c), s	7.0	0.0	39.4	5.2	2.5	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1753	784	600	3050	139	64
V/C Ratio(X)	0.29	0.00	0.96	0.32	0.52	0.00
Avail Cap(c_a), veh/h	1753	784	693	3050	901	414
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.45	0.45	1.00	0.00
Uniform Delay (d), s/veh	10.4	0.0	38.2	1.0	56.3	0.0
Incr Delay (d2), s/veh	0.4	0.0	12.7	0.1	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	20.8	2.4	1.2	0.0
LnGrp Delay(d),s/veh	10.8	0.0	50.8	1.1	59.3	0.0
LnGrp LOS	B		D	A	E	
Approach Vol, veh/h	505			1556	72	
Approach Delay, s/veh	10.8			19.5	59.3	
Approach LOS	B			B	E	

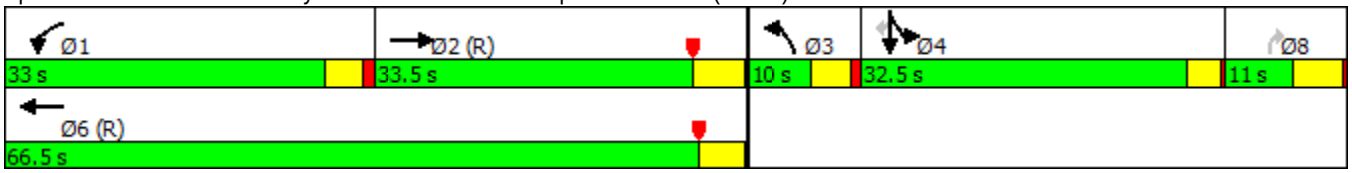
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	45.5	66.0				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	48.5	27.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	41.4	9.0				7.2		4.5
Green Ext Time (p_c), s	0.6	7.8				10.4		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	18.8
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	744	381	205	60	288	256	20	35
Future Volume (vph)	744	381	205	60	288	256	20	35
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	33.5	33.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	27.9%	27.5%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	28.6	38.1	71.7	5.5	7.1	18.2	18.2	18.2
Actuated g/C Ratio	0.24	0.32	0.60	0.05	0.06	0.15	0.15	0.15
v/c Ratio	1.03	0.82	0.11	0.89	0.82	0.66	0.61	0.11
Control Delay	83.8	61.7	4.4	134.9	23.4	60.1	56.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.8	61.7	4.4	134.9	23.4	60.1	56.7	0.6
LOS	F	E	A	F	C	E	E	A
Approach Delay	83.8		41.6				51.9	
Approach LOS	F		D				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 59.4	Intersection LOS: E
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	744	16	381	205	0	60	0	288	256	20	35
Future Volume (veh/h)	0	744	16	381	205	0	60	0	288	256	20	35
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	818	18	419	225	0	66	0	316	297	0	38
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1847	41	385	2787	0	0	0	0	370	0	175
Arrive On Green	0.00	0.54	0.54	0.40	1.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11
Sat Flow, veh/h	0	3511	75	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	409	427	419	225	0		0.0		297	0	38
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	17.3	17.4	28.5	0.0	0.0				10.7	0.0	2.7
Cycle Q Clear(g_c), s	0.0	17.3	17.4	28.5	0.0	0.0				10.7	0.0	2.7
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	923	965	385	2787	0				370	0	175
V/C Ratio(X)	0.00	0.44	0.44	1.09	0.08	0.00				0.80	0.00	0.22
Avail Cap(c_a), veh/h	0	923	965	385	2787	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.7	16.7	36.2	0.0	0.0				51.8	0.0	48.3
Incr Delay (d2), s/veh	0.0	1.5	1.5	72.2	0.1	0.0				4.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.6	8.9	20.3	0.0	0.0				5.0	0.0	1.2
LnGrp Delay(d),s/veh	0.0	18.2	18.2	108.4	0.1	0.0				55.9	0.0	48.9
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		836			644						335	
Approach Delay, s/veh		18.2			70.5						55.1	
Approach LOS		B			E						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	33.0	69.8		17.2		102.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	28.5	28.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	30.5	19.4		12.7		2.0		
Green Ext Time (p_c), s	0.0	2.9		1.0		4.4		

Intersection Summary	
HCM 2010 Ctrl Delay	43.6
HCM 2010 LOS	D

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	400	108	18	1021	27	5
Future Volume (vph)	400	108	18	1021	27	5
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.2	24.2	9.6	24.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	52.0	52.0	5.3	55.1	13.0	13.0
Actuated g/C Ratio	0.65	0.65	0.07	0.69	0.16	0.16
v/c Ratio	0.37	0.11	0.19	0.90	0.11	0.02
Control Delay	8.7	2.0	49.6	21.9	34.9	21.8
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	8.7	2.0	49.6	21.9	34.9	21.8
LOS	A	A	D	C	C	C
Approach Delay	7.3			22.4	33.0	
Approach LOS	A			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 80.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 74.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	400	108	18	1021	27	5
Future Volume (veh/h)	400	108	18	1021	27	5
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	435	117	20	1110	29	5
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1082	920	37	1244	235	222
Arrive On Green	0.60	0.60	0.02	0.69	0.15	0.15
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	435	117	20	1110	29	5
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	8.8	2.3	0.8	34.3	1.1	0.2
Cycle Q Clear(g_c), s	8.8	2.3	0.8	34.3	1.1	0.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1082	920	37	1244	235	222
V/C Ratio(X)	0.40	0.13	0.54	0.89	0.12	0.02
Avail Cap(c_a), veh/h	1883	1601	117	2134	634	599
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.2	5.9	33.3	8.6	25.6	25.3
Incr Delay (d2), s/veh	0.2	0.1	4.4	2.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	1.0	0.4	17.6	0.5	0.1
LnGrp Delay(d),s/veh	7.5	6.0	37.7	11.4	25.9	25.3
LnGrp LOS	A	A	D	B	C	C
Approach Vol, veh/h	552			1130	34	
Approach Delay, s/veh	7.2			11.9	25.8	
Approach LOS	A			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.2	47.6				53.8		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.8	10.8				36.3		3.1
Green Ext Time (p_c), s	0.0	2.9				11.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	6	0	32	117	9
Future Vol, veh/h	0	6	0	32	117	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	7	0	35	127	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	132	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	923	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	923	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	923	-	-
HCM Lane V/C Ratio	-	0.007	-	-
HCM Control Delay (s)	-	8.9	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	4	29	114	9
Future Vol, veh/h	3	0	4	29	114	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	0	4	32	124	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	169	129	134	0	-	0
Stage 1	129	-	-	-	-	-
Stage 2	40	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	826	926	1463	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	824	926	1463	-	-	-
Mov Cap-2 Maneuver	800	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1463	-	800	-	-
HCM Lane V/C Ratio	0.003	-	0.004	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	0	20	23	79	35
Future Vol, veh/h	9	0	20	23	79	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	10	0	22	25	86	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	173	105	124	0	-	0
Stage 1	105	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	822	955	1475	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	810	955	1475	-	-	-
Mov Cap-2 Maneuver	796	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	946	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	3.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1475	-	796	-	-
HCM Lane V/C Ratio	0.015	-	0.012	-	-
HCM Control Delay (s)	7.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	1	5	35	50	28
Future Vol, veh/h	8	1	5	35	50	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	1	5	38	54	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	119	70	85	0	-	0
Stage 1	70	-	-	-	-	-
Stage 2	49	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	882	998	1524	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	879	998	1524	-	-	-
Mov Cap-2 Maneuver	842	-	-	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	976	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1524	-	857	-	-
HCM Lane V/C Ratio	0.004	-	0.011	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	1	5	32	21	30
Future Vol, veh/h	8	1	5	32	21	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	1	5	35	23	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	85	39	55	0	-	0
Stage 1	39	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	921	1038	1563	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	918	1038	1563	-	-	-
Mov Cap-2 Maneuver	868	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1563	-	884	-	-
HCM Lane V/C Ratio	0.003	-	0.011	-	-
HCM Control Delay (s)	7.3	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	1	2	34	9	14
Future Vol, veh/h	4	1	2	34	9	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	1	2	37	10	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	58	17	25	0	-	0
Stage 1	17	-	-	-	-	-
Stage 2	41	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	954	1068	1603	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	953	1068	1603	-	-	-
Mov Cap-2 Maneuver	889	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	986	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1603	-	920	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	7.2	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	68	710	6	2	8
Future Vol, veh/h	30	68	710	6	2	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	74	772	7	2	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	772	0	-	0	911	772
Stage 1	-	-	-	-	772	-
Stage 2	-	-	-	-	139	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	852	-	-	-	307	403
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	893	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	852	-	-	-	295	403
Mov Cap-2 Maneuver	-	-	-	-	426	-
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	858	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	852	-	-	-	426	403
HCM Lane V/C Ratio	0.038	-	-	-	0.005	0.022
HCM Control Delay (s)	9.4	-	-	-	13.5	14.1
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	402	0	0	1039	0	0	0	0	1	0	0
Future Vol, veh/h	3	402	0	0	1039	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	442	0	0	1142	0	0	0	0	1	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	1142	0	-	-	-	0				1590	1590	1142
Stage 1	-	-	-	-	-	-				1142	1142	-
Stage 2	-	-	-	-	-	-				448	448	-
Critical Hdwy	4.1	-	-	-	-	-				6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	619	-	0	0	-	-				120	109	246
Stage 1	-	-	0	0	-	-				307	278	-
Stage 2	-	-	0	0	-	-				648	576	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	619	-	-	-	-	-				119	0	246
Mov Cap-2 Maneuver	-	-	-	-	-	-				235	0	-
Stage 1	-	-	-	-	-	-				307	0	-
Stage 2	-	-	-	-	-	-				645	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	619	-	-	-	235
HCM Lane V/C Ratio	0.005	-	-	-	0.005
HCM Control Delay (s)	10.8	-	-	-	20.4
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	393	20	11	1056	16	20
Future Vol, veh/h	393	20	11	1056	16	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	409	21	11	1100	17	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	430	0	1543	215
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	1123	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1140	-	117	796
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	314	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1140	-	116	796
Mov Cap-2 Maneuver	-	-	-	-	278	-
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	311	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	278	796	-	-	1140	-
HCM Lane V/C Ratio	0.06	0.026	-	-	0.01	-
HCM Control Delay (s)	18.8	9.6	-	-	8.2	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	356	23	916	150	18
Future Volume (vph)	356	23	916	150	18
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	30.8	5.1	34.3	10.1	10.1
Actuated g/C Ratio	0.55	0.09	0.61	0.18	0.18
v/c Ratio	0.24	0.17	0.91	0.57	0.07
Control Delay	7.0	28.5	23.6	32.1	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	28.5	23.6	32.1	11.2
LOS	A	C	C	C	B
Approach Delay	7.0		23.7	29.8	
Approach LOS	A		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 55.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	356	57	23	916	150	18
Future Volume (veh/h)	356	57	23	916	150	18
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	391	63	25	1007	165	17
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1508	241	47	1120	287	271
Arrive On Green	0.51	0.51	0.03	0.62	0.18	0.18
Sat Flow, veh/h	3034	470	1619	1800	1619	1530
Grp Volume(v), veh/h	226	228	25	1007	165	17
Grp Sat Flow(s),veh/h/ln	1710	1705	1619	1800	1619	1530
Q Serve(g_s), s	4.2	4.3	0.9	27.0	5.3	0.5
Cycle Q Clear(g_c), s	4.2	4.3	0.9	27.0	5.3	0.5
Prop In Lane		0.28	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	876	873	47	1120	287	271
V/C Ratio(X)	0.26	0.26	0.54	0.90	0.57	0.06
Avail Cap(c_a), veh/h	882	880	144	1235	287	271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.7	7.8	27.0	9.1	21.3	19.3
Incr Delay (d2), s/veh	0.2	0.2	3.5	8.5	8.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.0	0.4	15.8	3.0	0.3
LnGrp Delay(d),s/veh	7.9	7.9	30.6	17.7	29.4	19.7
LnGrp LOS	A	A	C	B	C	B
Approach Vol, veh/h	454			1032	182	
Approach Delay, s/veh	7.9			18.0	28.5	
Approach LOS	A			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.2	35.1				41.3		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	2.9	6.3				29.0		7.3
Green Ext Time (p_c), s	0.0	10.4				6.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	276	61	730	209	65
Future Volume (vph)	276	61	730	209	65
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	22.6	5.4	28.1	13.7	13.7
Actuated g/C Ratio	0.43	0.10	0.53	0.26	0.26
v/c Ratio	0.32	0.42	0.86	0.56	0.18
Control Delay	11.5	33.7	20.6	26.2	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	33.7	20.6	26.2	16.4
LOS	B	C	C	C	B
Approach Delay	11.5		21.6	23.9	
Approach LOS	B		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 62.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	276	124	61	730	209	65
Future Volume (veh/h)	276	124	61	730	209	65
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	310	139	69	820	235	55
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	906	396	98	976	411	388
Arrive On Green	0.39	0.39	0.06	0.54	0.25	0.25
Sat Flow, veh/h	2386	1004	1619	1800	1619	1530
Grp Volume(v), veh/h	229	220	69	820	235	55
Grp Sat Flow(s),veh/h/ln	1710	1590	1619	1800	1619	1530
Q Serve(g_s), s	4.9	5.1	2.2	20.2	6.7	1.5
Cycle Q Clear(g_c), s	4.9	5.1	2.2	20.2	6.7	1.5
Prop In Lane		0.63	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	675	628	98	976	411	388
V/C Ratio(X)	0.34	0.35	0.71	0.84	0.57	0.14
Avail Cap(c_a), veh/h	835	776	165	1219	411	388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	24.4	10.2	17.2	15.3
Incr Delay (d2), s/veh	0.3	0.3	3.5	4.5	5.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.3	1.1	11.0	3.7	0.7
LnGrp Delay(d),s/veh	11.5	11.6	27.9	14.6	22.9	16.0
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	449			889	290	
Approach Delay, s/veh	11.5			15.7	21.6	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.8	27.1				34.8		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.2	7.1				22.2		8.7
Green Ext Time (p_c), s	0.0	7.6				6.4		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	81	251	8	5	730	113	14	19	17	38	12	47
Future Vol, veh/h	81	251	8	5	730	113	14	19	17	38	12	47
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	85	264	8	5	768	119	15	20	18	40	13	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	888	0	0	275	0	0	1310	1340	139	1153	1284	829
Stage 1	-	-	-	-	-	-	441	441	-	839	839	-
Stage 2	-	-	-	-	-	-	869	899	-	314	445	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	771	-	-	1300	-	-	128	154	890	165	166	374
Stage 1	-	-	-	-	-	-	570	580	-	363	384	-
Stage 2	-	-	-	-	-	-	349	360	-	677	578	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	771	-	-	1299	-	-	98	136	887	137	147	374
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	216	-	243	264	-
Stage 1	-	-	-	-	-	-	506	515	-	323	382	-
Stage 2	-	-	-	-	-	-	292	358	-	567	513	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0	22.1	23.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	263	771	-	-	1299	-	-	296
HCM Lane V/C Ratio	0.2	0.111	-	-	0.004	-	-	0.345
HCM Control Delay (s)	22.1	10.2	-	-	7.8	-	-	23.4
HCM Lane LOS	C	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0.4	-	-	0	-	-	1.5

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	291	14	24	793	55	21
Future Vol, veh/h	291	14	24	793	55	21
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	320	15	26	871	60	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	336	0	1252	169
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	924	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1235	-	179	852
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	390	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1235	-	175	851
Mov Cap-2 Maneuver	-	-	-	-	343	-
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	382	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	411	-	-	1235	-
HCM Lane V/C Ratio	0.203	-	-	0.021	-
HCM Control Delay (s)	16	-	-	8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	96.9
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	312	0	0	0	0	0	817	0	0
Future Vol, veh/h	0	0	0	312	0	0	0	0	0	817	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	335	0	0	0	0	0	878	0	0
Number of Lanes	0	0	0	1	0	0	0	0	0	1	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay	13.9	128.6
HCM LOS	B	F

Lane	NBLn1	EBLn1
Vol Left, %	100%	0%
Vol Thru, %	0%	0%
Vol Right, %	0%	100%
Sign Control	Stop	Stop
Traffic Vol by Lane	817	312
LT Vol	817	0
Through Vol	0	0
RT Vol	0	312
Lane Flow Rate	878	335
Geometry Grp	1	1
Degree of Util (X)	1.217	0.484
Departure Headway (Hd)	4.986	5.679
Convergence, Y/N	Yes	Yes
Cap	729	637
Service Time	3.053	3.679
HCM Lane V/C Ratio	1.204	0.526
HCM Control Delay	128.6	13.9
HCM Lane LOS	F	B
HCM 95th-tile Q	30.1	2.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

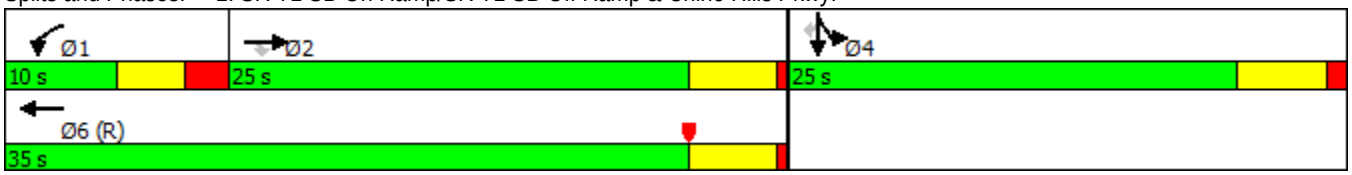
Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	0	0
Future Vol, veh/h	0	0	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	0	0
Number of Lanes	0	0	0	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1105	661	17	900	379	226	667
Future Volume (vph)	1105	661	17	900	379	226	667
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.40	0.71	0.13	0.54	0.61	0.58	1.19
Control Delay	11.4	9.5	38.0	9.5	22.8	21.5	123.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	9.5	38.0	9.5	22.8	21.5	123.8
LOS	B	A	D	A	C	C	F
Approach Delay	10.7			10.0		75.4	
Approach LOS	B			A		E	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1105	661	17	900	0	0	0	0	379	226	667
Future Volume (veh/h)	0	1105	661	17	900	0	0	0	0	379	226	667
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1163	570	18	947	0				318	351	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2498	608	35	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.04	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1163	570	18	947	0				318	351	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	8.3	21.8	0.7	0.0	0.0				9.8	9.7	0.0
Cycle Q Clear(g_c), s	0.0	8.3	21.8	0.7	0.0	0.0				9.8	9.7	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2498	608	35	1739	0				540	600	510
V/C Ratio(X)	0.00	0.47	0.94	0.51	0.54	0.00				0.59	0.58	0.00
Avail Cap(c_a), veh/h	0	2498	608	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.81	0.81	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.1	17.2	28.4	0.0	0.0				16.6	16.6	0.0
Incr Delay (d2), s/veh	0.0	0.1	22.3	3.5	1.0	0.0				4.7	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.5	12.6	0.3	0.2	0.0				5.0	5.5	0.0
LnGrp Delay(d),s/veh	0.0	13.3	39.4	31.9	1.0	0.0				21.3	20.7	0.0
LnGrp LOS		B	D	C	A					C	C	
Approach Vol, veh/h		1733			965						669	
Approach Delay, s/veh		21.9			1.6						21.0	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.3	28.7		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	23.8		11.8		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.5		20.6		

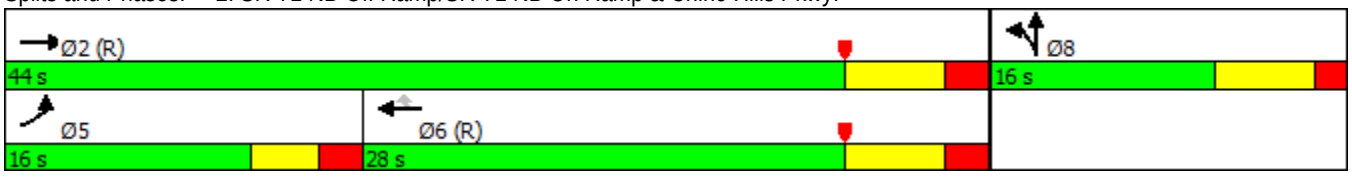
Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	395	1088	579	521	338	102
Future Volume (vph)	395	1088	579	521	338	102
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.8	37.5	21.7	21.7	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.80	0.55	0.50	0.80	0.74	0.56
Control Delay	36.4	9.1	16.8	20.3	44.9	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	9.1	16.8	20.3	44.9	27.5
LOS	D	A	B	C	D	C
Approach Delay		16.4	18.5			34.1
Approach LOS		B	B			C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 19.7	Intersection LOS: B
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	395	1088	0	0	579	521	338	102	5	0	0	0
Future Volume (veh/h)	395	1088	0	0	579	521	338	102	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	425	1170	0	0	623	557	363	110	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	514	2138	0	0	1257	555	540	297	3			
Arrive On Green	0.17	0.63	0.00	0.00	0.37	0.37	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1781	16			
Grp Volume(v), veh/h	425	1170	0	0	623	557	363	0	111			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	8.3	11.7	0.0	0.0	8.5	22.1	6.3	0.0	3.3			
Cycle Q Clear(g_c), s	8.3	11.7	0.0	0.0	8.5	22.1	6.3	0.0	3.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	514	2138	0	0	1257	555	540	0	300			
V/C Ratio(X)	0.83	0.55	0.00	0.00	0.50	1.00	0.67	0.00	0.37			
Avail Cap(c_a), veh/h	542	2138	0	0	1257	555	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.63	0.63	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.9	6.4	0.0	0.0	14.7	19.0	23.5	0.0	22.2			
Incr Delay (d2), s/veh	8.9	0.9	0.0	0.0	0.9	31.3	6.6	0.0	3.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	5.6	0.0	0.0	4.1	13.9	3.3	0.0	1.9			
LnGrp Delay(d),s/veh	32.8	7.3	0.0	0.0	15.5	50.3	30.0	0.0	25.7			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1595			1180			474				
Approach Delay, s/veh		14.1			32.0			29.0				
Approach LOS		B			C			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			15.4	28.6		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		13.7			10.3	24.1		8.3
Green Ext Time (p_c), s		16.0			0.1	0.0		0.4

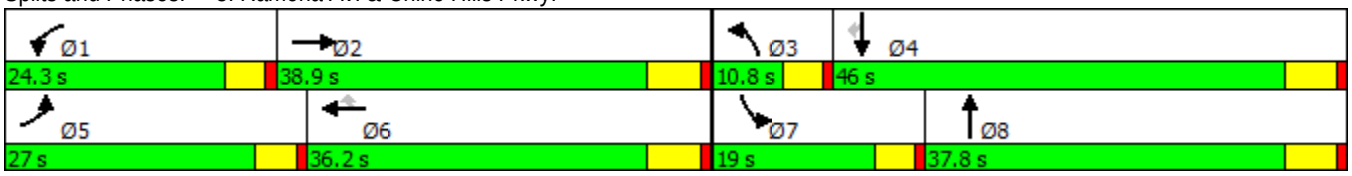
Intersection Summary	
HCM 2010 Ctrl Delay	22.8
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	246	845	137	679	126	21	284	151	445	400
Future Volume (vph)	246	845	137	679	126	21	284	151	445	400
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	21.0	35.3	14.6	28.9	28.9	5.7	32.1	13.6	44.1	44.1
Actuated g/C Ratio	0.18	0.30	0.13	0.25	0.25	0.05	0.28	0.12	0.38	0.38
v/c Ratio	0.90	0.61	0.72	0.85	0.27	0.28	0.47	0.86	0.37	0.51
Control Delay	80.5	37.3	69.5	52.8	5.6	64.0	32.5	88.5	28.8	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.5	37.3	69.5	52.8	5.6	64.0	32.5	88.5	28.8	5.1
LOS	F	D	E	D	A	E	C	F	C	A
Approach Delay		47.0		48.9			34.0		28.4	
Approach LOS		D		D			C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.5	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 40.5	Intersection LOS: D
Intersection Capacity Utilization 88.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	845	2	137	679	126	21	284	134	151	445	400
Future Volume (veh/h)	246	845	2	137	679	126	21	284	134	151	445	400
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	262	899	2	146	722	89	22	302	88	161	473	316
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	287	1578	4	172	822	363	36	741	212	186	1286	567
Arrive On Green	0.18	0.31	0.31	0.11	0.24	0.24	0.02	0.28	0.28	0.11	0.38	0.38
Sat Flow, veh/h	1619	5063	11	1619	3420	1509	1619	2616	748	1619	3420	1507
Grp Volume(v), veh/h	262	582	319	146	722	89	22	195	195	161	473	316
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1654	1619	1710	1507
Q Serve(g_s), s	17.9	16.8	16.8	10.0	23.0	5.4	1.5	10.4	10.8	11.0	11.3	18.7
Cycle Q Clear(g_c), s	17.9	16.8	16.8	10.0	23.0	5.4	1.5	10.4	10.8	11.0	11.3	18.7
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	287	1021	560	172	822	363	36	484	468	186	1286	567
V/C Ratio(X)	0.91	0.57	0.57	0.85	0.88	0.25	0.62	0.40	0.42	0.87	0.37	0.56
Avail Cap(c_a), veh/h	321	1021	560	282	920	406	89	484	468	206	1286	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	32.5	32.5	49.6	41.3	34.6	54.8	32.8	32.9	49.1	25.5	27.8
Incr Delay (d2), s/veh	26.0	0.9	1.7	6.1	9.4	0.5	6.3	2.5	2.7	25.9	0.8	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	7.7	8.6	4.8	11.9	2.3	0.7	5.3	5.3	6.3	5.5	8.4
LnGrp Delay(d),s/veh	71.6	33.5	34.3	55.7	50.8	35.1	61.0	35.3	35.6	75.1	26.3	31.8
LnGrp LOS	E	C	C	E	D	D	E	D	D	E	C	C
Approach Vol, veh/h		1163			957			412			950	
Approach Delay, s/veh		42.3			50.1			36.8			36.4	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.6	41.0	7.1	48.3	24.6	33.0	17.6	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	12.0	18.8	3.5	20.7	19.9	25.0	13.0	12.8
Green Ext Time (p_c), s	0.1	10.4	0.0	6.1	0.1	2.2	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	42.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	833	120	45	777	87	27
Future Vol, veh/h	833	120	45	777	87	27
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	926	133	50	863	97	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	929	0	1461	466
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	532	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	744	-	122	549
Stage 1	-	-	-	-	350	-
Stage 2	-	-	-	-	559	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	744	-	113	547
Mov Cap-2 Maneuver	-	-	-	-	292	-
Stage 1	-	-	-	-	349	-
Stage 2	-	-	-	-	521	-

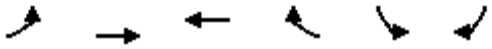
Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	22.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	328	-	-	744	-
HCM Lane V/C Ratio	0.386	-	-	0.067	-
HCM Control Delay (s)	22.7	-	-	10.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.8	-	-	0.2	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	119	741	589	58	232
Future Volume (vph)	119	741	589	58	232
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	10.5	38.4	23.2	23.5	35.3
Actuated g/C Ratio	0.14	0.52	0.31	0.32	0.48
v/c Ratio	0.56	0.45	0.66	0.07	0.31
Control Delay	40.3	11.5	24.9	20.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	11.5	24.9	20.9	5.3
LOS	D	B	C	C	A
Approach Delay		15.5	24.9	8.5	
Approach LOS		B	C	A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 73.7	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	741	589	60	58	232
Future Volume (veh/h)	119	741	589	60	58	232
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	129	805	640	63	63	66
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	160	1911	1260	124	870	601
Arrive On Green	0.10	0.56	0.40	0.40	0.29	0.29
Sat Flow, veh/h	1619	3510	3229	309	2956	1530
Grp Volume(v), veh/h	129	805	348	355	63	66
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1737	1478	1530
Q Serve(g_s), s	6.2	10.7	12.1	12.1	1.2	2.2
Cycle Q Clear(g_c), s	6.2	10.7	12.1	12.1	1.2	2.2
Prop In Lane	1.00			0.18	1.00	1.00
Lane Grp Cap(c), veh/h	160	1911	687	698	870	601
V/C Ratio(X)	0.81	0.42	0.51	0.51	0.07	0.11
Avail Cap(c_a), veh/h	583	3694	1132	1150	870	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	10.0	17.7	17.7	20.1	15.2
Incr Delay (d2), s/veh	3.6	0.2	0.8	0.8	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	5.1	5.9	6.0	0.5	2.4
LnGrp Delay(d),s/veh	38.4	10.3	18.6	18.6	20.2	15.6
LnGrp LOS	D	B	B	B	C	B
Approach Vol, veh/h		934	703		129	
Approach Delay, s/veh		14.1	18.6		17.8	
Approach LOS		B	B		B	

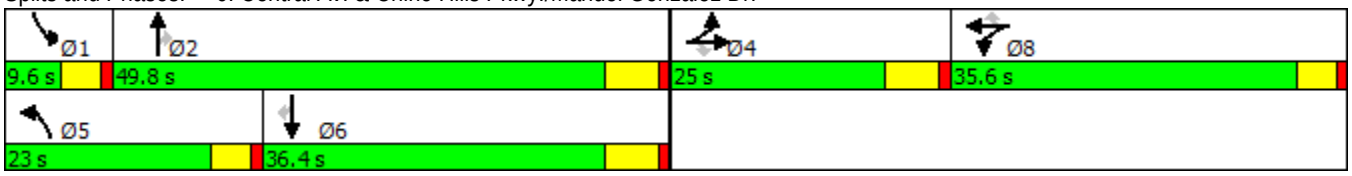
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		49.9		29.0	12.4	37.5		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		12.7		4.2	8.2	14.1		
Green Ext Time (p_c), s		21.5		0.3	0.1	17.6		

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	2	361	11	40	32	246	705	1	10	804	222
Future Volume (vph)	475	2	361	11	40	32	246	705	1	10	804	222
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.87	0.82	0.64	0.05	0.18	0.10	0.89	0.43	0.00	0.14	0.83	0.42
Control Delay	69.7	62.8	9.7	37.5	40.1	0.6	73.0	18.3	0.0	54.2	41.7	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	62.8	9.7	37.5	40.1	0.6	73.0	18.3	0.0	54.2	41.7	14.7
LOS	E	E	A	D	D	A	E	B	A	D	D	B
Approach Delay		41.8			24.4			32.4			36.0	
Approach LOS		D			C			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 36.2	Intersection LOS: D
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	475	2	361	11	40	32	246	705	1	10	804	222
Future Volume (veh/h)	475	2	361	11	40	32	246	705	1	10	804	222
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	517	0	264	12	43	18	267	766	1	11	874	171
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	623	0	294	154	171	144	295	1658	741	21	1080	477
Arrive On Green	0.19	0.00	0.19	0.09	0.09	0.09	0.18	0.48	0.48	0.01	0.32	0.32
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	517	0	264	12	43	18	267	766	1	11	874	171
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	14.9	0.0	16.3	0.7	2.1	1.1	15.6	14.4	0.0	0.7	22.8	8.5
Cycle Q Clear(g_c), s	14.9	0.0	16.3	0.7	2.1	1.1	15.6	14.4	0.0	0.7	22.8	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	623	0	294	154	171	144	295	1658	741	21	1080	477
V/C Ratio(X)	0.83	0.00	0.90	0.08	0.25	0.12	0.90	0.46	0.00	0.51	0.81	0.36
Avail Cap(c_a), veh/h	641	0	303	518	576	487	307	1658	741	84	1080	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	0.0	38.2	40.0	40.7	40.2	38.8	16.6	12.9	47.5	30.5	25.6
Incr Delay (d2), s/veh	8.8	0.0	26.9	0.2	0.8	0.4	26.9	0.9	0.0	6.9	6.6	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	9.1	0.3	1.1	0.5	9.2	7.0	0.0	0.3	11.7	3.8
LnGrp Delay(d),s/veh	46.4	0.0	65.1	40.2	41.4	40.5	65.7	17.5	12.9	54.4	37.1	27.7
LnGrp LOS	D		E	D	D	D	E	B	B	D	D	C
Approach Vol, veh/h		781			73			1034			1056	
Approach Delay, s/veh		52.7			41.0			29.9			35.7	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	52.8		24.4	22.3	36.4		13.8
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	16.4		18.3	17.6	24.8		4.1
Green Ext Time (p_c), s	0.0	17.9		0.3	0.0	5.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	38.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	5	540	4	369	9	550	675	503	682
Future Volume (vph)	25	5	540	4	369	9	550	675	503	682
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.1	10.1	23.9	23.9	67.7	5.1	24.0	24.0	38.0	64.9
Actuated g/C Ratio	0.09	0.09	0.22	0.22	0.61	0.05	0.22	0.22	0.34	0.59
v/c Ratio	0.18	0.16	0.85	0.81	0.37	0.12	0.77	0.86	0.94	0.25
Control Delay	53.6	26.5	65.7	60.6	5.5	59.2	50.3	18.2	64.4	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	26.5	65.7	60.6	5.5	59.2	50.3	18.2	64.4	13.3
LOS	D	C	E	E	A	E	D	B	E	B
Approach Delay		40.1		39.8			32.8			34.7
Approach LOS		D		D			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 110.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 35.5	Intersection LOS: D
Intersection Capacity Utilization 96.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	5	20	540	4	369	9	550	675	503	682	17
Future Volume (veh/h)	25	5	20	540	4	369	9	550	675	503	682	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	5	12	565	0	233	9	573	527	524	710	14
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	107	31	74	656	0	822	18	723	319	542	2654	52
Arrive On Green	0.07	0.07	0.07	0.20	0.00	0.20	0.01	0.21	0.21	0.33	0.54	0.54
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4959	98
Grp Volume(v), veh/h	26	0	17	565	0	233	9	573	527	524	469	255
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.7	0.0	1.1	18.9	0.0	9.3	0.6	17.8	23.7	35.7	8.7	8.7
Cycle Q Clear(g_c), s	1.7	0.0	1.1	18.9	0.0	9.3	0.6	17.8	23.7	35.7	8.7	8.7
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	107	0	105	656	0	822	18	723	319	542	1753	953
V/C Ratio(X)	0.24	0.00	0.16	0.86	0.00	0.28	0.51	0.79	1.65	0.97	0.27	0.27
Avail Cap(c_a), veh/h	144	0	143	809	0	894	72	723	319	542	1753	953
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.7	0.0	49.4	43.2	0.0	14.2	55.1	41.9	44.2	36.7	14.1	14.1
Incr Delay (d2), s/veh	0.4	0.0	0.3	8.0	0.0	0.2	8.2	8.7	307.4	30.2	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	9.2	0.0	4.0	0.3	9.2	37.1	20.4	4.0	4.4
LnGrp Delay(d),s/veh	50.1	0.0	49.7	51.1	0.0	14.4	63.3	50.6	351.6	66.9	14.5	14.8
LnGrp LOS	D		D	D		B	E	D	F	E	B	B
Approach Vol, veh/h		43			798			1109			1248	
Approach Delay, s/veh		50.0			40.4			193.7			36.6	
Approach LOS		D			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.0	5.8	65.8		28.5
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	37.7	25.7		3.7	2.6	10.7		20.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	21.8		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	92.2
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1123	838	152
Future Volume (vph)	1123	838	152
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	87.6	87.6	22.9
Actuated g/C Ratio	0.73	0.73	0.19
v/c Ratio	0.45	0.25	1.01dr
Control Delay	4.5	5.9	50.6
Queue Delay	0.0	0.0	0.0
Total Delay	4.5	5.9	50.6
LOS	A	A	D
Approach Delay	4.5	5.9	50.6
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 55.9%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1123	367	0	838	152	328
Future Volume (veh/h)	1123	367	0	838	152	328
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1182	386	0	882	160	184
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2869	937	0	3844	224	212
Arrive On Green	1.00	1.00	0.00	0.78	0.14	0.14
Sat Flow, veh/h	3830	1197	0	5238	1619	1530
Grp Volume(v), veh/h	1056	512	0	882	160	184
Grp Sat Flow(s),veh/h/ln	1638	1589	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	5.7	11.3	14.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	5.7	11.3	14.1
Prop In Lane		0.75	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2563	1243	0	3844	224	212
V/C Ratio(X)	0.41	0.41	0.00	0.23	0.71	0.87
Avail Cap(c_a), veh/h	2563	1243	0	3844	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.5	49.4	50.6
Incr Delay (d2), s/veh	0.5	1.0	0.0	0.1	1.6	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.0	2.6	5.2	6.2
LnGrp Delay(d),s/veh	0.5	1.0	0.0	3.6	51.0	54.8
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1568			882	344	
Approach Delay, s/veh	0.7			3.6	53.0	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		98.4				98.4		21.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				7.7		16.1
Green Ext Time (p_c), s		17.7				17.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	679	85	654	813	0
Future Volume (vph)	679	85	654	813	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	32.9	32.9	32.9	79.1	79.1
Actuated g/C Ratio	0.27	0.27	0.27	0.66	0.66
v/c Ratio	0.51	0.18	0.74	0.73	0.86
Control Delay	39.0	8.3	39.4	18.3	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	8.3	39.4	18.3	25.5
LOS	D	A	D	B	C
Approach Delay	35.6		39.4		22.2
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 30.4	Intersection LOS: C
Intersection Capacity Utilization 76.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	679	85	0	654	335	0	0	0	813	0	751
Future Volume (veh/h)	0	679	85	0	654	335	0	0	0	813	0	751
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	686	0	0	661	338				727	132	633
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2048	638	0	1365	638				836	140	671
Arrive On Green	0.00	0.42	0.00	0.00	0.14	0.14				0.52	0.52	0.52
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	271	1300
Grp Volume(v), veh/h	0	686	0	0	661	338				727	0	765
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1571
Q Serve(g_s), s	0.0	11.4	0.0	0.0	22.4	24.7				47.3	0.0	55.1
Cycle Q Clear(g_c), s	0.0	11.4	0.0	0.0	22.4	24.7				47.3	0.0	55.1
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.83
Lane Grp Cap(c), veh/h	0	2048	638	0	1365	638				836	0	811
V/C Ratio(X)	0.00	0.33	0.00	0.00	0.48	0.53				0.87	0.00	0.94
Avail Cap(c_a), veh/h	0	2048	638	0	1365	638				1100	0	1067
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	23.7	0.0	0.0	39.8	40.8				25.5	0.0	27.3
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	1.2	3.1				5.0	0.0	12.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.2	0.0	0.0	10.4	11.0				22.2	0.0	26.5
LnGrp Delay(d),s/veh	0.0	24.2	0.0	0.0	41.1	44.0				30.4	0.0	39.3
LnGrp LOS		C			D	D				C		D
Approach Vol, veh/h		686			999						1492	
Approach Delay, s/veh		24.2			42.0						35.0	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		54.5		65.5		54.5		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		13.4		57.1		26.7		
Green Ext Time (p_c), s		8.4		4.9		2.8		

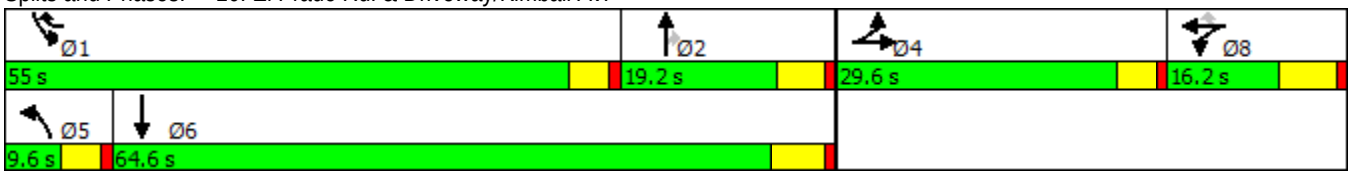
Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	34	8	3	573	4	192	23	789	336
Future Volume (vph)	34	8	3	573	4	192	23	789	336
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.17	0.07	0.14	0.51	0.05	0.74	0.07	0.94	0.17
Control Delay	42.6	29.8	48.4	2.6	53.2	60.2	0.3	45.2	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	29.8	48.4	2.6	53.2	60.2	0.3	45.2	10.7
LOS	D	C	D	A	D	E	A	D	B
Approach Delay		38.7	4.5			53.8			34.6
Approach LOS		D	A			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 27.8	Intersection LOS: C
Intersection Capacity Utilization 81.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	8	8	22	3	573	4	192	23	789	336	13
Future Volume (veh/h)	34	8	8	22	3	573	4	192	23	789	336	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	36	8	6	23	3	152	4	202	23	831	354	13
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	71	53	148	19	900	79	236	201	795	1930	71
Arrive On Green	0.07	0.07	0.07	0.10	0.10	0.10	0.05	0.13	0.13	0.49	0.57	0.57
Sat Flow, veh/h	1619	956	717	1525	199	1530	1619	1800	1530	1619	3365	123
Grp Volume(v), veh/h	36	0	14	26	0	152	4	202	23	831	179	188
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1724	0	1530	1619	1800	1530	1619	1710	1778
Q Serve(g_s), s	2.2	0.0	0.8	1.4	0.0	4.7	0.2	11.3	1.4	50.4	5.1	5.2
Cycle Q Clear(g_c), s	2.2	0.0	0.8	1.4	0.0	4.7	0.2	11.3	1.4	50.4	5.1	5.2
Prop In Lane	1.00		0.43	0.88		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	124	167	0	900	79	236	201	795	981	1020
V/C Ratio(X)	0.30	0.00	0.11	0.16	0.00	0.17	0.05	0.86	0.11	1.04	0.18	0.18
Avail Cap(c_a), veh/h	395	0	408	168	0	901	79	246	209	795	981	1020
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	44.3	42.5	0.0	9.7	46.5	43.6	39.3	26.1	10.4	10.4
Incr Delay (d2), s/veh	1.4	0.0	0.4	0.4	0.0	0.1	0.1	23.9	0.3	44.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.4	0.7	0.0	2.0	0.1	7.2	0.6	32.1	2.4	2.5
LnGrp Delay(d),s/veh	46.4	0.0	44.7	42.9	0.0	9.7	46.6	67.5	39.6	70.3	10.5	10.5
LnGrp LOS	D		D	D		A	D	E	D	F	B	B
Approach Vol, veh/h		50			178			229			1198	
Approach Delay, s/veh		45.9			14.6			64.3			52.0	
Approach LOS		D			B			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.2		12.2	9.6	64.6		16.1
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	13.3		4.2	2.2	7.2		6.7
Green Ext Time (p_c), s	0.0	0.2		0.1	0.0	3.3		0.2

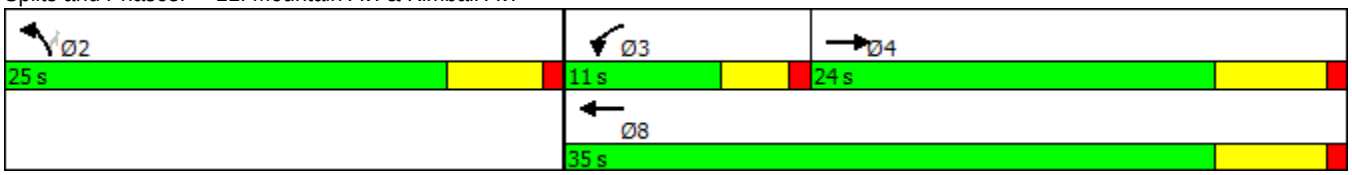
Intersection Summary	
HCM 2010 Ctrl Delay	49.5
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	843	14	502	94	62
Future Volume (vph)	843	14	502	94	62
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	17.2	7.3	18.7	8.8	8.8
Actuated g/C Ratio	0.44	0.19	0.48	0.22	0.22
v/c Ratio	0.67	0.05	0.34	0.28	0.17
Control Delay	14.7	18.1	7.4	15.7	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	18.1	7.4	15.7	5.8
LOS	B	B	A	B	A
Approach Delay	14.7		7.7	11.8	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 39.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 42.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	843	67	14	502	94	62
Future Volume (veh/h)	843	67	14	502	94	62
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	926	72	15	552	103	45
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1213	94	44	1747	303	286
Arrive On Green	0.38	0.38	0.03	0.51	0.19	0.19
Sat Flow, veh/h	3306	250	1619	3510	1619	1530
Grp Volume(v), veh/h	492	506	15	552	103	45
Grp Sat Flow(s),veh/h/ln	1710	1756	1619	1710	1619	1530
Q Serve(g_s), s	9.4	9.4	0.3	3.5	2.1	0.9
Cycle Q Clear(g_c), s	9.4	9.4	0.3	3.5	2.1	0.9
Prop In Lane		0.14	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	645	662	44	1747	303	286
V/C Ratio(X)	0.76	0.76	0.34	0.32	0.34	0.16
Avail Cap(c_a), veh/h	823	845	303	2650	852	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	10.2	17.9	5.3	13.2	12.7
Incr Delay (d2), s/veh	2.3	2.2	1.7	0.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.9	0.2	1.6	0.9	0.4
LnGrp Delay(d),s/veh	12.5	12.4	19.6	5.4	13.4	12.8
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	998			567	148	
Approach Delay, s/veh	12.5			5.8	13.3	
Approach LOS	B			A	B	

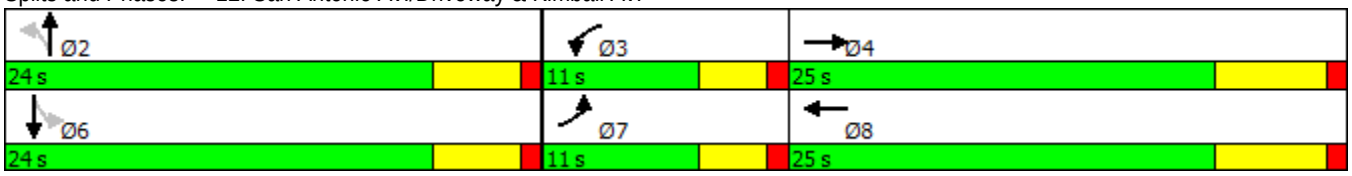
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	5.0	20.1				25.1
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		4.1	2.3	11.4				5.5
Green Ext Time (p_c), s		0.1	0.0	2.7				4.3

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	908	14	466	49	0		
Future Volume (vph)	908	14	466	49	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	25.0	11.0	25.0	24.0	24.0	24.0	11.0
Total Split (%)	41.7%	18.3%	41.7%	40.0%	40.0%	40%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	15.0	7.5	16.3	8.9	8.9		
Actuated g/C Ratio	0.41	0.20	0.44	0.24	0.24		
v/c Ratio	0.70	0.05	0.31	0.17	0.03		
Control Delay	15.0	17.7	7.2	14.2	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	15.0	17.7	7.2	14.2	0.1		
LOS	B	B	A	B	A		
Approach Delay	15.0		7.5		10.6		
Approach LOS	B		A		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 36.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 42.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	908	19	14	466	0	49	0	17	0	0	0
Future Volume (veh/h)	0	908	19	14	466	0	49	0	17	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	956	20	15	491	0	52	0	16	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	4	1283	27	44	1839	0	507	0	293	197	344	0
Arrive On Green	0.00	0.37	0.37	0.03	0.51	0.00	0.19	0.00	0.19	0.00	0.00	0.00
Sat Flow, veh/h	1619	3426	72	1619	3600	0	1619	0	1530	1340	1800	0
Grp Volume(v), veh/h	0	477	499	15	491	0	52	0	16	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1787	1619	1800	0	1619	0	1530	1340	1800	0
Q Serve(g_s), s	0.0	8.9	8.9	0.3	2.8	0.0	1.0	0.0	0.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.9	8.9	0.3	2.8	0.0	1.0	0.0	0.3	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	640	669	44	1839	0	507	0	293	197	344	0
V/C Ratio(X)	0.00	0.75	0.75	0.34	0.27	0.00	0.10	0.00	0.05	0.00	0.00	0.00
Avail Cap(c_a), veh/h	310	888	928	310	1869	0	1042	0	799	640	940	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.9	9.9	17.5	5.1	0.0	12.4	0.0	12.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.2	1.2	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.3	4.5	0.2	1.4	0.0	0.4	0.0	0.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	11.1	11.1	19.2	5.1	0.0	12.4	0.0	12.1	0.0	0.0	0.0
LnGrp LOS		B	B	B	A		B		B			
Approach Vol, veh/h		976			506			68			0	
Approach Delay, s/veh		11.1			5.5			12.3			0.0	
Approach LOS		B			A			B				

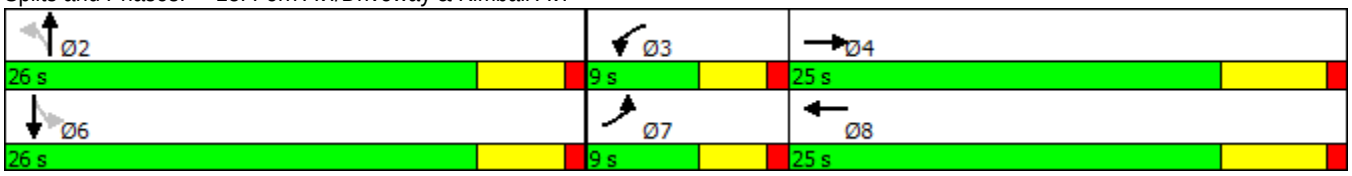
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.0	19.7		11.9	0.0	24.7
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		3.0	2.3	10.9		0.0	0.0	4.8
Green Ext Time (p_c), s		0.0	0.0	2.8		0.0	0.0	3.6

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	913	11	408	45	1	100	7
Future Volume (vph)	4	913	11	408	45	1	100	7
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.3	17.8	5.3	17.8	8.7	8.7	8.7	8.7
Actuated g/C Ratio	0.14	0.46	0.14	0.46	0.22	0.22	0.22	0.22
v/c Ratio	0.02	0.68	0.06	0.30	0.18	0.11	0.41	0.09
Control Delay	20.5	14.4	20.7	9.1	14.5	6.1	18.3	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	14.4	20.7	9.1	14.5	6.1	18.3	7.7
LOS	C	B	C	A	B	A	B	A
Approach Delay		14.4		9.4		10.7		15.8
Approach LOS		B		A		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 38.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 49.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	913	21	11	408	0	45	1	37	100	7	24
Future Volume (veh/h)	4	913	21	11	408	0	45	1	37	100	7	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	1038	18	12	464	0	51	1	22	114	8	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	11	1387	24	25	1411	0	408	11	232	401	122	137
Arrive On Green	0.01	0.40	0.40	0.02	0.41	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1619	3438	60	1619	3510	0	1339	67	1473	1332	775	872
Grp Volume(v), veh/h	5	516	540	12	464	0	51	0	23	114	0	17
Grp Sat Flow(s),veh/h/ln	1619	1710	1788	1619	1710	0	1339	0	1540	1332	0	1646
Q Serve(g_s), s	0.1	8.9	8.9	0.3	3.2	0.0	1.2	0.0	0.4	2.8	0.0	0.3
Cycle Q Clear(g_c), s	0.1	8.9	8.9	0.3	3.2	0.0	1.5	0.0	0.4	3.2	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.00	1.00		0.96	1.00		0.53
Lane Grp Cap(c), veh/h	11	690	721	25	1411	0	408	0	242	401	0	259
V/C Ratio(X)	0.46	0.75	0.75	0.47	0.33	0.00	0.13	0.00	0.09	0.28	0.00	0.07
Avail Cap(c_a), veh/h	235	957	1001	235	1915	0	1017	0	943	1007	0	1008
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	8.8	8.8	16.8	6.9	0.0	13.0	0.0	12.4	13.8	0.0	12.4
Incr Delay (d2), s/veh	10.5	1.2	1.1	4.9	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.4	4.6	0.1	1.5	0.0	0.4	0.0	0.2	1.0	0.0	0.1
LnGrp Delay(d),s/veh	27.6	10.0	9.9	21.7	6.9	0.0	13.0	0.0	12.5	13.9	0.0	12.4
LnGrp LOS	C	A	A	C	A		B		B	B		B
Approach Vol, veh/h		1061			476			74			131	
Approach Delay, s/veh		10.0			7.3			12.9			13.7	
Approach LOS		B			A			B			B	

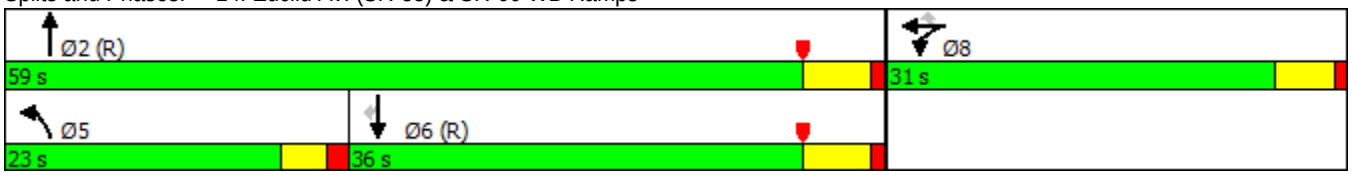
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.3	4.5	19.6		10.3	4.2	19.9
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		3.5	2.3	10.9		5.2	2.1	5.2
Green Ext Time (p_c), s		0.2	0.0	3.0		0.2	0.0	3.7

Intersection Summary	
HCM 2010 Ctrl Delay	9.7
HCM 2010 LOS	A

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	533	6	398	242	979	857	518
Future Volume (vph)	533	6	398	242	979	857	518
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.3	23.3	23.3	16.8	56.2	34.9	34.9
Actuated g/C Ratio	0.26	0.26	0.26	0.19	0.62	0.39	0.39
v/c Ratio	0.86	0.82	0.69	0.85	0.48	0.68	0.60
Control Delay	53.0	45.2	27.6	48.6	19.8	27.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	53.0	45.2	27.6	48.6	21.1	27.4	5.3
LOS	D	D	C	D	C	C	A
Approach Delay		42.4			26.5	19.1	
Approach LOS		D			C	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 27.8	Intersection LOS: C
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	533	6	398	242	979	0	0	857	518
Future Volume (veh/h)	0	0	0	533	6	398	242	979	0	0	857	518
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				646	0	178	255	1031	0	0	902	545
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				735	0	343	281	2245	0	0	1481	642
Arrive On Green				0.23	0.00	0.23	0.35	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1483
Grp Volume(v), veh/h				646	0	178	255	1031	0	0	902	545
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1483
Q Serve(g_s), s				17.3	0.0	9.3	13.5	0.0	0.0	0.0	18.3	29.6
Cycle Q Clear(g_c), s				17.3	0.0	9.3	13.5	0.0	0.0	0.0	18.3	29.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				735	0	343	281	2245	0	0	1481	642
V/C Ratio(X)				0.88	0.00	0.52	0.91	0.46	0.00	0.00	0.61	0.85
Avail Cap(c_a), veh/h				935	0	436	333	2245	0	0	1481	642
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.60	0.60	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.6	0.0	30.5	28.7	0.0	0.0	0.0	19.6	22.9
Incr Delay (d2), s/veh				6.8	0.0	0.5	15.7	0.4	0.0	0.0	1.9	13.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.4	0.0	3.9	7.2	0.1	0.0	0.0	9.0	14.5
LnGrp Delay(d),s/veh				40.4	0.0	30.9	44.4	0.4	0.0	0.0	21.5	36.0
LnGrp LOS				D		C	D	A			C	D
Approach Vol, veh/h					824			1286			1447	
Approach Delay, s/veh					38.4			9.1			27.0	
Approach LOS					D			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		64.6			20.1	44.5		25.4
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			15.5	31.6		19.3
Green Ext Time (p_c), s		37.5			0.1	0.0		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	23.2
HCM 2010 LOS	C

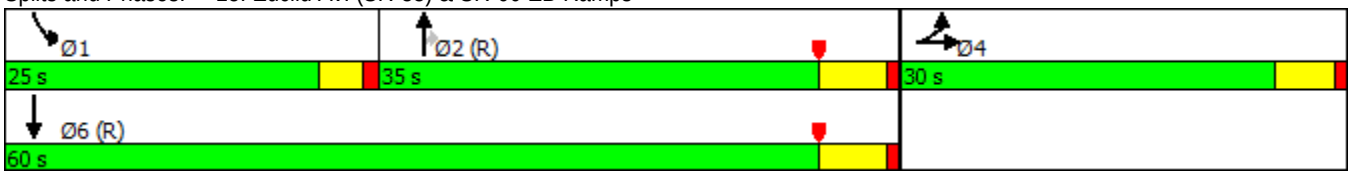
Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	370	2	851	576	295	1094
Future Volume (vph)	370	2	851	576	295	1094
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.6	22.6	33.7	33.7	19.2	56.9
Actuated g/C Ratio	0.25	0.25	0.37	0.37	0.21	0.63
v/c Ratio	0.88	0.85	0.68	0.64	0.88	0.52
Control Delay	57.0	43.4	28.1	5.8	52.1	4.1
Queue Delay	2.5	1.7	0.0	0.0	0.0	0.4
Total Delay	59.5	45.1	28.1	5.8	52.1	4.5
LOS	E	D	C	A	D	A
Approach Delay		52.0	19.1			14.6
Approach LOS		D	B			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 23.9 — Intersection LOS: C
Intersection Capacity Utilization 90.0% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	2	327	0	0	0	0	851	576	295	1094	0
Future Volume (veh/h)	370	2	327	0	0	0	0	851	576	295	1094	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	319	85	257				0	868	588	301	1116	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	388	95	286				0	1352	587	330	2201	0
Arrive On Green	0.24	0.24	0.24				0.00	0.40	0.40	0.27	0.86	0.00
Sat Flow, veh/h	1619	395	1194				0	3510	1486	1619	3510	0
Grp Volume(v), veh/h	319	0	342				0	868	588	301	1116	0
Grp Sat Flow(s),veh/h/ln	1619	0	1589				0	1710	1486	1619	1710	0
Q Serve(g_s), s	16.8	0.0	18.8				0.0	18.5	35.6	16.2	7.5	0.0
Cycle Q Clear(g_c), s	16.8	0.0	18.8				0.0	18.5	35.6	16.2	7.5	0.0
Prop In Lane	1.00		0.75				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	388	0	381				0	1352	587	330	2201	0
V/C Ratio(X)	0.82	0.00	0.90				0.00	0.64	1.00	0.91	0.51	0.00
Avail Cap(c_a), veh/h	450	0	441				0	1352	587	378	2201	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.85	0.85	0.61	0.61	0.00
Uniform Delay (d), s/veh	32.4	0.0	33.1				0.0	22.0	27.2	32.0	2.9	0.0
Incr Delay (d2), s/veh	8.9	0.0	17.5				0.0	2.0	34.5	15.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	0.0	10.1				0.0	9.1	20.2	8.6	3.4	0.0
LnGrp Delay(d),s/veh	41.3	0.0	50.7				0.0	24.1	61.7	47.6	3.4	0.0
LnGrp LOS	D		D					C	F	D	A	
Approach Vol, veh/h		661						1456			1417	
Approach Delay, s/veh		46.2						39.3			12.8	
Approach LOS		D						D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.3	41.1		26.6		63.4		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	18.2	37.6		20.8		9.5		
Green Ext Time (p_c), s	0.1	0.0		0.8		35.1		

Intersection Summary	
HCM 2010 Ctrl Delay	29.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	119	308	90	268	121	1112	58	312	969	132
Future Volume (vph)	119	308	90	268	121	1112	58	312	969	132
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	45.0	45.0	45.0	45.0	21.0	48.0	48.0	27.0	54.0	54.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	17.5%	40.0%	40.0%	22.5%	45.0%	45.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.0	26.0	27.0	27.0	13.8	60.4	60.4	17.5	64.4	64.4
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.12	0.50	0.50	0.15	0.54	0.54
v/c Ratio	0.90	0.60	0.72	0.52	0.68	0.47	0.07	0.76	0.38	0.16
Control Delay	97.3	39.4	69.4	35.4	78.6	9.8	0.3	60.6	18.6	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.3	39.4	69.4	35.4	78.6	9.8	0.3	60.6	18.6	3.9
LOS	F	D	E	D	E	A	A	E	B	A
Approach Delay		51.8		41.8		15.8			26.5	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	308	126	90	268	117	121	1112	58	312	969	132
Future Volume (veh/h)	119	308	126	90	268	117	121	1112	58	312	969	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	124	321	100	94	279	101	126	1158	37	325	1009	79
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	226	692	212	210	665	235	150	2305	708	377	2462	765
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.12	0.62	0.62	0.13	0.50	0.50
Sat Flow, veh/h	958	2570	786	926	2471	873	1619	4914	1509	2956	4914	1526
Grp Volume(v), veh/h	124	212	209	94	191	189	126	1158	37	325	1009	79
Grp Sat Flow(s),veh/h/ln	958	1710	1646	926	1710	1634	1619	1638	1509	1478	1638	1526
Q Serve(g_s), s	14.7	12.4	12.8	11.4	11.0	11.5	9.1	15.5	1.1	12.9	15.5	3.3
Cycle Q Clear(g_c), s	26.2	12.4	12.8	24.1	11.0	11.5	9.1	15.5	1.1	12.9	15.5	3.3
Prop In Lane	1.00		0.48	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	460	443	210	460	440	150	2305	708	377	2462	765
V/C Ratio(X)	0.55	0.46	0.47	0.45	0.42	0.43	0.84	0.50	0.05	0.86	0.41	0.10
Avail Cap(c_a), veh/h	277	551	531	268	566	541	217	2305	708	554	2462	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.53	0.53	0.53	0.85	0.85	0.85
Uniform Delay (d), s/veh	47.1	36.6	36.7	46.8	36.1	36.2	51.8	14.9	12.2	51.3	18.8	15.7
Incr Delay (d2), s/veh	2.1	0.7	0.8	1.5	0.6	0.7	10.2	0.4	0.1	5.5	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	6.0	5.9	3.0	5.3	5.3	4.5	7.0	0.5	5.6	7.1	1.4
LnGrp Delay(d),s/veh	49.1	37.3	37.5	48.3	36.7	36.9	62.0	15.3	12.3	56.8	19.2	16.0
LnGrp LOS	D	D	D	D	D	D	E	B	B	E	B	B
Approach Vol, veh/h		545			474			1321			1413	
Approach Delay, s/veh		40.1			39.1			19.7			27.7	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.8	61.6		38.6	16.0	65.4		38.6
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	22.5	42.7		38.7	16.1	* 50		* 40
Max Q Clear Time (g_c+I1), s	14.9	17.5		28.2	11.1	17.5		26.1
Green Ext Time (p_c), s	0.4	14.7		4.1	0.1	16.8		4.7

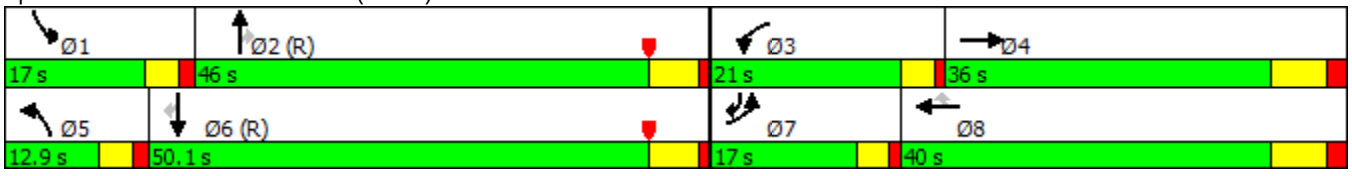
Intersection Summary	
HCM 2010 Ctrl Delay	28.1
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	144	369	166	331	53	70	988	261	125	809	159
Future Volume (vph)	144	369	166	331	53	70	988	261	125	809	159
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.9	22.8	15.6	25.5	25.5	9.7	46.7	46.7	13.9	53.2	67.6
Actuated g/C Ratio	0.11	0.19	0.13	0.21	0.21	0.08	0.39	0.39	0.12	0.44	0.56
v/c Ratio	0.90	0.71	0.85	0.49	0.14	0.58	0.80	0.38	0.72	0.57	0.18
Control Delay	99.3	50.1	84.3	42.9	1.9	63.0	40.1	15.9	61.9	36.2	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	50.1	84.3	42.9	1.9	63.0	40.1	15.9	61.9	36.2	11.4
LOS	F	D	F	D	A	E	D	B	E	D	B
Approach Delay		62.5		51.4			36.5			35.5	
Approach LOS		E		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 42.7	Intersection LOS: D
Intersection Capacity Utilization 77.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	369	60	166	331	53	70	988	261	125	809	159
Future Volume (veh/h)	144	369	60	166	331	53	70	988	261	125	809	159
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	155	397	31	178	356	57	75	1062	150	134	870	73
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	566	44	202	658	290	93	1457	652	159	1595	869
Arrive On Green	0.11	0.18	0.18	0.12	0.19	0.19	0.02	0.14	0.14	0.03	0.15	0.15
Sat Flow, veh/h	1619	3216	250	1619	3420	1506	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	155	210	218	178	356	57	75	1062	150	134	870	73
Grp Sat Flow(s),veh/h/ln	1619	1710	1756	1619	1710	1506	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	11.3	13.9	14.0	13.0	11.3	3.8	5.5	35.7	10.4	9.9	28.2	4.0
Cycle Q Clear(g_c), s	11.3	13.9	14.0	13.0	11.3	3.8	5.5	35.7	10.4	9.9	28.2	4.0
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	301	309	202	658	290	93	1457	652	159	1595	869
V/C Ratio(X)	0.88	0.70	0.70	0.88	0.54	0.20	0.80	0.73	0.23	0.84	0.55	0.08
Avail Cap(c_a), veh/h	175	413	424	229	941	414	113	1457	652	169	1595	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.81	0.81	0.91	0.91	0.91
Uniform Delay (d), s/veh	52.8	46.4	46.5	51.6	43.7	40.7	58.2	44.9	34.1	57.1	39.0	18.5
Incr Delay (d2), s/veh	36.2	4.3	4.4	26.0	1.0	0.5	23.5	2.6	0.7	27.4	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	6.9	7.1	7.2	5.4	1.6	3.1	17.5	4.6	5.7	13.7	1.7
LnGrp Delay(d),s/veh	89.0	50.8	50.9	77.7	44.7	41.1	81.7	47.5	34.7	84.6	40.2	18.7
LnGrp LOS	F	D	D	E	D	D	F	D	C	F	D	B
Approach Vol, veh/h		583			591			1287			1077	
Approach Delay, s/veh		61.0			54.3			48.0			44.3	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	56.6	19.0	28.1	11.4	61.5	17.0	30.1
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	11.9	37.7	15.0	16.0	7.5	30.2	13.3	13.3
Green Ext Time (p_c), s	0.0	2.4	0.0	5.1	0.0	10.3	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	50.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	67	166	33	68	93	47	1270	201	15	914	60
Future Volume (vph)	67	166	33	68	93	47	1270	201	15	914	60
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	9.0	69.8	69.8	9.2	70.0	70.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	34.2%	7.5%	58.2%	58.2%	7.7%	58.3%	58.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.0	22.0	22.0		22.0	7.3	81.0	81.0	5.7	75.9	75.9
Actuated g/C Ratio	0.18	0.18	0.18		0.18	0.06	0.68	0.68	0.05	0.63	0.63
v/c Ratio	0.41	0.52	0.10		0.84	0.49	0.57	0.20	0.20	0.44	0.06
Control Delay	48.2	48.4	3.5		73.5	79.3	9.9	3.8	73.1	5.2	0.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	48.4	3.5		73.5	79.3	9.9	3.8	73.1	5.2	0.4
LOS	D	D	A		E	E	A	A	E	A	A
Approach Delay		42.8			73.5		11.2			5.9	
Approach LOS		D			E		B			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 80.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	166	33	68	93	23	47	1270	201	15	914	60
Future Volume (veh/h)	67	166	33	68	93	23	47	1270	201	15	914	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	69	171	15	70	96	20	48	1309	151	15	942	33
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	215	364	309	108	135	24	59	2203	985	27	2133	934
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.07	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1224	1800	1530	331	668	120	1619	3420	1530	1619	3420	1498
Grp Volume(v), veh/h	69	171	15	186	0	0	48	1309	151	15	942	33
Grp Sat Flow(s),veh/h/ln	1224	1800	1530	1119	0	0	1619	1710	1530	1619	1710	1498
Q Serve(g_s), s	0.0	10.1	0.9	10.5	0.0	0.0	3.5	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.7	10.1	0.9	20.6	0.0	0.0	3.5	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	215	364	309	267	0	0	59	2203	985	27	2133	934
V/C Ratio(X)	0.32	0.47	0.05	0.70	0.00	0.00	0.81	0.59	0.15	0.57	0.44	0.04
Avail Cap(c_a), veh/h	315	510	433	389	0	0	74	2203	985	77	2133	934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.56	0.56	0.56	0.75	0.75	0.75
Uniform Delay (d), s/veh	42.5	42.2	38.6	47.7	0.0	0.0	55.2	0.0	0.0	57.6	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.9	0.1	3.2	0.0	0.0	20.6	0.7	0.2	5.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.1	0.4	6.2	0.0	0.0	1.9	0.2	0.1	0.5	0.1	0.0
LnGrp Delay(d),s/veh	43.3	43.2	38.6	51.0	0.0	0.0	75.8	0.7	0.2	62.8	0.5	0.1
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		255			186			1508			990	
Approach Delay, s/veh		42.9			51.0			3.0			1.4	
Approach LOS		D			D			A			A	

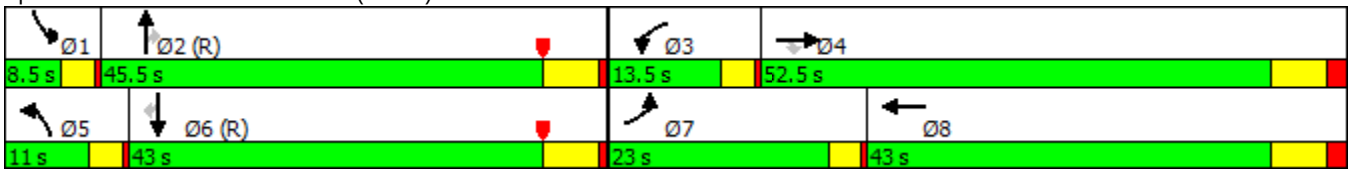
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	83.3		31.2	7.9	80.9		31.2
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	63.8		34.0	5.5	64.0		34.0
Max Q Clear Time (g_c+I1), s	3.1	2.0		12.7	5.5	2.0		22.6
Green Ext Time (p_c), s	0.0	28.1		2.1	0.0	28.2		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	9.0
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	288	217	156	24	47	87	1231	36	22	889	127
Future Volume (vph)	288	217	156	24	47	87	1231	36	22	889	127
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	26.9	26.9	10.0	14.4	10.8	66.3	66.3	5.7	57.7	57.7
Actuated g/C Ratio	0.16	0.22	0.22	0.08	0.12	0.09	0.55	0.55	0.05	0.48	0.48
v/c Ratio	1.13	0.56	0.34	0.19	0.28	0.62	0.67	0.04	0.30	0.56	0.17
Control Delay	142.0	45.5	6.5	54.9	38.5	55.0	27.4	1.4	67.0	25.7	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.0	45.5	6.5	54.9	38.5	55.0	27.4	1.4	67.0	25.7	7.2
LOS	F	D	A	D	D	E	C	A	E	C	A
Approach Delay		78.3			43.2		28.5			24.3	
Approach LOS		E			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 38.0	Intersection LOS: D
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	288	217	156	24	47	14	87	1231	36	22	889	127
Future Volume (veh/h)	288	217	156	24	47	14	87	1231	36	22	889	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	297	224	85	25	48	9	90	1269	28	23	916	78
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	315	268	76	88	16	101	2014	901	36	1877	821
Arrive On Green	0.16	0.17	0.17	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1475	277	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	297	224	85	25	0	57	90	1269	28	23	916	78
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1751	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	14.1	5.8	1.8	0.0	3.8	6.7	40.9	1.8	1.7	28.9	5.2
Cycle Q Clear(g_c), s	19.5	14.1	5.8	1.8	0.0	3.8	6.7	40.9	1.8	1.7	28.9	5.2
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	315	268	76	0	104	101	2014	901	36	1877	821
V/C Ratio(X)	1.13	0.71	0.32	0.33	0.00	0.55	0.89	0.63	0.03	0.64	0.49	0.10
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	2014	901	67	1877	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.65	0.65	0.65	0.91	0.91	0.91
Uniform Delay (d), s/veh	50.3	46.6	43.2	55.3	0.0	54.9	58.3	36.3	20.6	59.1	34.0	24.3
Incr Delay (d2), s/veh	94.7	2.2	0.5	0.9	0.0	3.3	40.9	1.0	0.0	6.1	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	7.2	2.5	0.8	0.0	1.9	4.1	19.7	0.8	0.8	13.9	2.2
LnGrp Delay(d),s/veh	144.9	48.9	43.7	56.3	0.0	58.1	99.3	37.3	20.6	65.2	34.8	24.5
LnGrp LOS	F	D	D	E		E	F	D	C	E	C	C
Approach Vol, veh/h		606			82			1387			1017	
Approach Delay, s/veh		95.2			57.6			41.0			34.7	
Approach LOS		F			E			D			C	

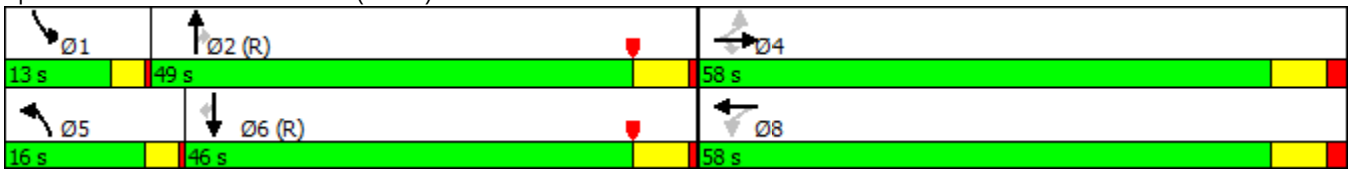
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	76.7	9.2	28.0	11.0	71.9	23.0	14.1
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.7	42.9	3.8	16.1	8.7	30.9	21.5	5.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	5.2	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	50.0
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	330	452	200	25	132	95	961	71	66	834	163
Future Volume (vph)	330	452	200	25	132	95	961	71	66	834	163
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7	10.7	54.1	54.1	8.5	50.1	50.1
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.09	0.45	0.45	0.07	0.42	0.42
v/c Ratio	0.87	0.72	0.31	0.16	0.26	0.67	0.64	0.10	0.59	0.60	0.23
Control Delay	58.2	39.5	4.1	25.8	24.8	56.0	42.0	19.5	90.1	17.7	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	39.5	4.1	25.8	24.8	56.0	42.0	19.5	90.1	17.7	4.0
LOS	E	D	A	C	C	E	D	B	F	B	A
Approach Delay		38.6			24.9		41.7			20.1	
Approach LOS		D			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 82.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	452	200	25	132	29	95	961	71	66	834	163
Future Volume (veh/h)	330	452	200	25	132	29	95	961	71	66	834	163
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	337	461	112	26	135	25	97	981	52	67	851	139
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	436	687	576	196	564	105	119	1469	657	83	1392	623
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.02	0.14	0.14	0.10	0.81	0.81
Sat Flow, veh/h	1176	1800	1508	805	1478	274	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	337	461	112	26	0	160	97	981	52	67	851	139
Grp Sat Flow(s),veh/h/ln	1176	1800	1508	805	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	32.8	25.5	5.9	3.3	0.0	7.5	7.2	32.6	3.5	4.9	11.0	2.5
Cycle Q Clear(g_c), s	40.2	25.5	5.9	28.9	0.0	7.5	7.2	32.6	3.5	4.9	11.0	2.5
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	436	687	576	196	0	669	119	1469	657	83	1392	623
V/C Ratio(X)	0.77	0.67	0.19	0.13	0.00	0.24	0.82	0.67	0.08	0.81	0.61	0.22
Avail Cap(c_a), veh/h	487	765	641	231	0	744	169	1469	657	128	1392	623
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.91	0.91	0.91	0.84	0.84	0.84
Uniform Delay (d), s/veh	38.9	30.8	24.8	42.8	0.0	25.2	57.7	43.4	30.9	53.3	7.6	6.8
Incr Delay (d2), s/veh	6.8	2.0	0.2	0.3	0.0	0.2	11.7	2.2	0.2	8.6	1.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	13.1	2.5	0.8	0.0	3.6	3.6	16.0	1.5	2.4	5.3	1.1
LnGrp Delay(d),s/veh	45.7	32.8	24.9	43.1	0.0	25.4	69.4	45.6	31.1	61.9	9.3	7.5
LnGrp LOS	D	C	C	D		C	E	D	C	E	A	A
Approach Vol, veh/h		910			186			1130			1057	
Approach Delay, s/veh		36.6			27.9			47.0			12.4	
Approach LOS		D			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	57.5		52.8	12.3	54.9		52.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	6.9	34.6		42.2	9.2	13.0		30.9
Green Ext Time (p_c), s	0.0	6.3		3.6	0.0	14.3		5.4

Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	47	27	149	5	12	77	1014	9	10	1031	49
Future Volume (vph)	47	27	149	5	12	77	1014	9	10	1031	49
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.3	15.3	15.3	15.3	15.3	10.5	92.5	92.5	5.5	82.2	82.2
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.09	0.77	0.77	0.05	0.68	0.68
v/c Ratio	0.32	0.13	0.48	0.03	0.11	0.60	0.42	0.01	0.15	0.48	0.05
Control Delay	47.8	41.4	10.2	36.4	25.8	74.5	2.5	0.0	68.2	5.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	41.4	10.2	36.4	25.8	74.5	2.5	0.0	68.2	5.6	0.1
LOS	D	D	B	D	C	E	A	A	E	A	A
Approach Delay		21.8			27.6		7.6			6.0	
Approach LOS		C			C		A			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 56.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	27	149	5	12	10	77	1014	9	10	1031	49
Future Volume (veh/h)	47	27	149	5	12	10	77	1014	9	10	1031	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	51	29	57	5	13	9	84	1102	9	11	1121	53
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	137	126	107	129	69	48	104	2738	1225	21	2563	1121
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.80	0.80	0.03	1.00	1.00
Sat Flow, veh/h	1333	1800	1530	1258	992	687	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	51	29	57	5	0	22	84	1102	9	11	1121	53
Grp Sat Flow(s),veh/h/ln	1333	1800	1530	1258	0	1679	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.5	1.8	4.3	0.5	0.0	1.5	6.1	11.4	0.1	0.8	0.0	0.0
Cycle Q Clear(g_c), s	6.0	1.8	4.3	2.3	0.0	1.5	6.1	11.4	0.1	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	137	126	107	129	0	117	104	2738	1225	21	2563	1121
V/C Ratio(X)	0.37	0.23	0.53	0.04	0.00	0.19	0.81	0.40	0.01	0.53	0.44	0.05
Avail Cap(c_a), veh/h	510	630	535	481	0	588	175	2738	1225	67	2563	1121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.83	0.83	0.83
Uniform Delay (d), s/veh	55.4	52.8	53.9	53.8	0.0	52.6	55.4	3.5	2.4	58.1	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.7	3.0	0.1	0.0	0.6	10.5	0.4	0.0	12.4	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.9	1.9	0.2	0.0	0.7	3.1	5.4	0.1	0.4	0.2	0.0
LnGrp Delay(d),s/veh	56.7	53.4	57.0	53.9	0.0	53.2	66.0	4.0	2.4	70.5	0.5	0.1
LnGrp LOS	E	D	E	D		D	E	A	A	E	A	A
Approach Vol, veh/h		137			27			1195			1185	
Approach Delay, s/veh		56.1			53.3			8.3			1.1	
Approach LOS		E			D			A			A	

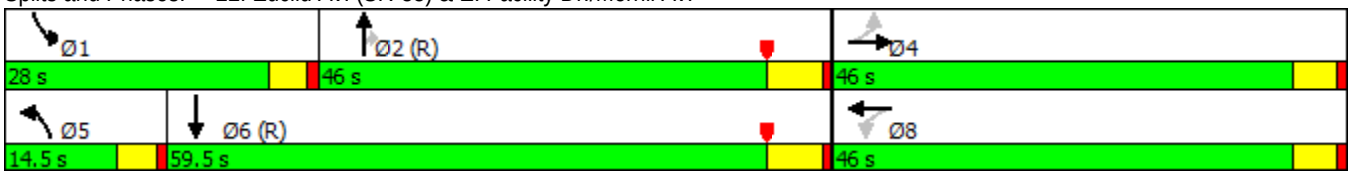
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	101.8		13.2	11.2	95.6		13.2
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.8	13.4		8.0	8.1	2.0		4.3
Green Ext Time (p_c), s	0.0	23.0		0.4	0.0	23.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	20	98	0	2	1025	180	254	907
Future Volume (vph)	5	20	98	0	2	1025	180	254	907
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		20.9		20.9	10.0	59.8	59.8	23.9	85.2
Actuated g/C Ratio		0.17		0.17	0.08	0.50	0.50	0.20	0.71
v/c Ratio		0.13		0.65	0.01	0.65	0.24	0.85	0.40
Control Delay		28.9		30.0	72.5	13.1	3.2	50.9	13.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.9		30.0	72.5	13.1	3.2	50.9	13.1
LOS		C		C	E	B	A	D	B
Approach Delay		28.9		30.0		11.7			21.3
Approach LOS		C		C		B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	20	11	98	0	101	2	1025	180	254	907	1
Future Volume (veh/h)	5	20	11	98	0	101	2	1025	180	254	907	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	22	4	105	0	81	2	1102	165	273	975	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	56	196	32	163	5	93	9	1859	814	296	2528	3
Arrive On Green	0.14	0.14	0.14	0.14	0.00	0.14	0.01	0.54	0.54	0.18	0.72	0.72
Sat Flow, veh/h	144	1356	222	806	33	647	1619	3420	1497	1619	3506	4
Grp Volume(v), veh/h	31	0	0	186	0	0	2	1102	165	273	476	500
Grp Sat Flow(s),veh/h/ln	1722	0	0	1486	0	0	1619	1710	1497	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	12.8	0.0	0.0	0.1	26.0	6.8	19.9	12.9	12.9
Cycle Q Clear(g_c), s	1.8	0.0	0.0	14.6	0.0	0.0	0.1	26.0	6.8	19.9	12.9	12.9
Prop In Lane	0.16		0.13	0.56		0.44	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	283	0	0	261	0	0	9	1859	814	296	1233	1298
V/C Ratio(X)	0.11	0.00	0.00	0.71	0.00	0.00	0.23	0.59	0.20	0.92	0.39	0.39
Avail Cap(c_a), veh/h	613	0	0	549	0	0	135	1859	814	317	1233	1298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.58	0.58	0.58	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	50.1	0.0	0.0	59.4	18.4	14.0	48.2	6.5	6.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.4	0.0	0.0	2.8	0.8	0.3	29.1	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	6.1	0.0	0.0	0.1	12.5	2.9	11.3	6.4	6.7
LnGrp Delay(d),s/veh	44.8	0.0	0.0	51.4	0.0	0.0	62.3	19.2	14.4	77.3	7.4	7.3
LnGrp LOS	D			D			E	B	B	E	A	A
Approach Vol, veh/h		31			186			1269			1249	
Approach Delay, s/veh		44.8			51.4			18.7			22.6	
Approach LOS		D			D			B			C	

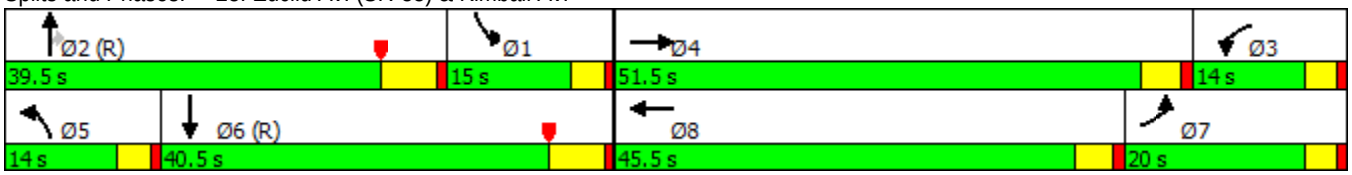
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.5	71.2		22.3	5.1	92.5		22.3
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	21.9	28.0		3.8	2.1	14.9		16.6
Green Ext Time (p_c), s	0.1	8.9		0.7	0.0	18.9		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	307	778	31	262	66	680	27	288	673
Future Volume (vph)	307	778	31	262	66	680	27	288	673
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	34.9	48.9	11.8	20.2	10.3	31.7	31.7	14.7	38.9
Actuated g/C Ratio	0.29	0.41	0.10	0.17	0.09	0.26	0.26	0.12	0.32
v/c Ratio	0.68	0.62	0.20	0.69	0.50	0.78	0.05	1.52	0.72
Control Delay	48.2	32.0	52.7	34.6	48.1	48.0	1.2	296.4	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	32.0	52.7	34.6	48.1	48.0	1.2	296.4	43.0
LOS	D	C	D	C	D	D	A	F	D
Approach Delay		36.4		35.7		46.4			113.0
Approach LOS		D		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.52	
Intersection Signal Delay: 61.9	Intersection LOS: E
Intersection Capacity Utilization 85.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	778	48	31	262	181	66	680	27	288	673	82
Future Volume (veh/h)	307	778	48	31	262	181	66	680	27	288	673	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	320	810	46	32	273	155	69	708	13	300	701	67
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	297	945	54	85	333	183	121	824	369	402	1358	130
Arrive On Green	0.18	0.29	0.29	0.05	0.16	0.16	0.02	0.08	0.08	0.25	0.43	0.43
Sat Flow, veh/h	1619	3290	187	1619	2129	1174	1619	3420	1530	1619	3151	301
Grp Volume(v), veh/h	320	421	435	32	218	210	69	708	13	300	380	388
Grp Sat Flow(s),veh/h/ln	1619	1710	1767	1619	1710	1593	1619	1710	1530	1619	1710	1742
Q Serve(g_s), s	22.0	27.9	27.9	2.3	14.8	15.4	5.1	24.5	0.9	20.5	19.5	19.6
Cycle Q Clear(g_c), s	22.0	27.9	27.9	2.3	14.8	15.4	5.1	24.5	0.9	20.5	19.5	19.6
Prop In Lane	1.00		0.11	1.00		0.74	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	297	491	508	85	267	249	121	824	369	402	737	751
V/C Ratio(X)	1.08	0.86	0.86	0.38	0.81	0.84	0.57	0.86	0.04	0.75	0.52	0.52
Avail Cap(c_a), veh/h	297	670	692	135	584	544	135	955	427	402	737	751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	0.88	0.88	0.88	0.92	0.92	0.92
Uniform Delay (d), s/veh	49.0	40.4	40.4	54.9	48.9	49.2	56.6	53.2	42.4	41.6	25.0	25.0
Incr Delay (d2), s/veh	65.9	5.9	5.8	1.0	2.3	3.0	1.7	10.1	0.2	6.1	2.4	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	14.0	14.5	1.0	7.1	7.0	2.3	12.8	0.4	9.8	9.7	9.9
LnGrp Delay(d),s/veh	114.9	46.3	46.2	56.0	51.2	52.2	58.3	63.4	42.5	47.7	27.4	27.3
LnGrp LOS	F	D	D	E	D	D	E	E	D	D	C	C
Approach Vol, veh/h		1176			460			790			1068	
Approach Delay, s/veh		64.9			52.0			62.6			33.1	
Approach LOS		E			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.8	34.9	10.3	39.0	13.0	57.7	26.0	23.3
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	22.5	26.5	4.3	29.9	7.1	21.6	24.0	17.4
Green Ext Time (p_c), s	0.0	2.4	0.0	4.5	0.0	3.7	0.0	1.4

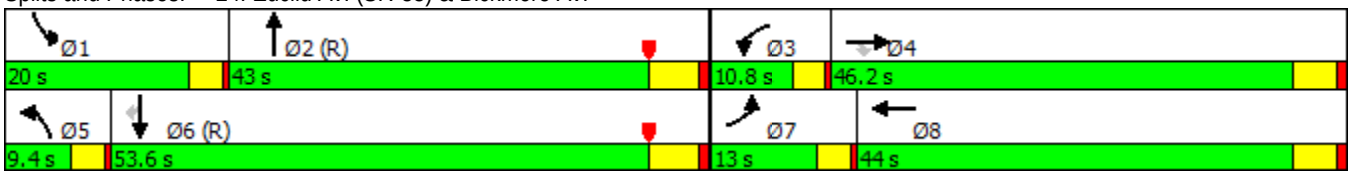
Intersection Summary	
HCM 2010 Ctrl Delay	53.0
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	66	86	45	59	25	15	648	125	537	54
Future Volume (vph)	66	86	45	59	25	15	648	125	537	54
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.0	16.0	16.0	8.5	15.5	5.6	66.1	13.8	79.5	79.5
Actuated g/C Ratio	0.08	0.13	0.13	0.07	0.13	0.05	0.55	0.12	0.66	0.66
v/c Ratio	0.60	0.40	0.16	0.58	0.37	0.23	0.46	0.75	0.26	0.06
Control Delay	74.2	49.2	1.2	74.0	18.3	84.0	8.1	82.0	2.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	49.2	1.2	74.0	18.3	84.0	8.1	82.0	2.6	0.1
LOS	E	D	A	E	B	F	A	F	A	A
Approach Delay		46.6			40.6		9.6		16.2	
Approach LOS		D			D		A		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 18.7	Intersection LOS: B
Intersection Capacity Utilization 53.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	86	45	59	25	64	15	648	109	125	537	54
Future Volume (veh/h)	66	86	45	59	25	64	15	648	109	125	537	54
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	73	96	31	66	28	59	17	720	111	139	597	60
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	91	144	123	82	39	82	29	1848	285	161	2412	1057
Arrive On Green	0.06	0.08	0.08	0.05	0.08	0.08	0.02	0.83	0.83	0.20	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	517	1090	1619	2962	456	1619	3420	1499
Grp Volume(v), veh/h	73	96	31	66	0	87	17	415	416	139	597	60
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1608	1619	1710	1708	1619	1710	1499
Q Serve(g_s), s	5.3	6.2	2.3	4.8	0.0	6.4	1.2	7.3	7.3	10.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	6.2	2.3	4.8	0.0	6.4	1.2	7.3	7.3	10.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.68	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	91	144	123	82	0	121	29	1067	1066	161	2412	1057
V/C Ratio(X)	0.81	0.66	0.25	0.80	0.00	0.72	0.58	0.39	0.39	0.86	0.25	0.06
Avail Cap(c_a), veh/h	128	618	525	98	0	522	80	1067	1066	223	2412	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.41	0.41	0.41	0.65	0.65	0.65
Uniform Delay (d), s/veh	56.0	53.6	51.8	56.4	0.0	54.3	58.1	4.5	4.5	47.3	0.0	0.0
Incr Delay (d2), s/veh	14.7	2.0	0.4	27.0	0.0	3.0	2.8	0.4	0.4	12.1	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.2	1.0	2.8	0.0	2.9	0.6	3.5	3.5	4.9	0.1	0.0
LnGrp Delay(d),s/veh	70.7	55.6	52.2	83.4	0.0	57.3	60.9	4.9	4.9	59.4	0.2	0.1
LnGrp LOS	E	E	D	F		E	E	A	A	E	A	A
Approach Vol, veh/h		200			153			848			796	
Approach Delay, s/veh		60.6			68.6			6.0			10.5	
Approach LOS		E			E			A			B	

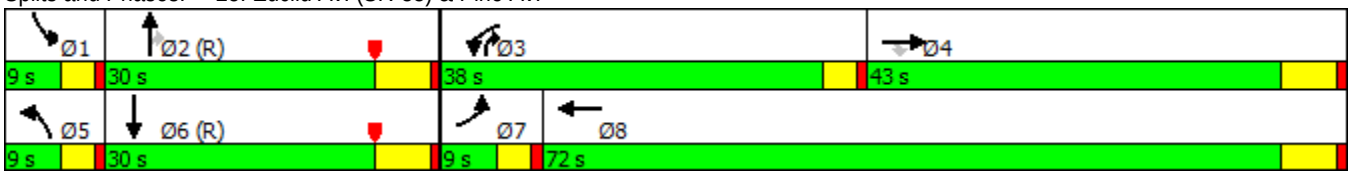
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	80.4	9.6	14.6	5.7	90.1	10.2	14.0
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	12.0	9.3	6.8	8.2	3.2	2.0	7.3	8.4
Green Ext Time (p_c), s	0.1	5.5	0.0	0.7	0.0	5.7	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	14	323	28	445	71	33	677	1022	64	528
Future Volume (vph)	14	323	28	445	71	33	677	1022	64	528
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	28.4	28.4	34.0	62.8	6.2	28.4	68.4	9.2	35.1
Actuated g/C Ratio	0.04	0.24	0.24	0.28	0.52	0.05	0.24	0.57	0.08	0.29
v/c Ratio	0.21	0.78	0.06	0.55	0.12	0.40	0.86	1.08	0.54	0.56
Control Delay	63.1	55.4	0.2	39.5	10.2	69.1	40.8	54.9	52.4	33.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	55.4	0.2	39.5	10.2	69.1	40.8	54.9	52.4	33.3
LOS	E	E	A	D	B	E	D	D	D	C
Approach Delay		51.4			34.0		49.7			35.4
Approach LOS		D			C		D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 44.6	Intersection LOS: D
Intersection Capacity Utilization 100.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	323	28	445	71	32	33	677	1022	64	528	14
Future Volume (veh/h)	14	323	28	445	71	32	33	677	1022	64	528	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	14	333	0	459	73	27	34	698	621	66	544	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	25	390	332	516	471	174	46	1369	880	67	1421	26
Arrive On Green	0.02	0.22	0.00	0.17	0.38	0.38	0.03	0.40	0.40	0.01	0.14	0.14
Sat Flow, veh/h	1619	1800	1530	2956	1254	464	1619	3420	1530	1619	3434	63
Grp Volume(v), veh/h	14	333	0	459	0	100	34	698	621	66	271	283
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1718	1619	1710	1530	1619	1710	1787
Q Serve(g_s), s	1.0	21.3	0.0	18.2	0.0	4.6	2.5	18.5	34.9	4.9	17.3	17.3
Cycle Q Clear(g_c), s	1.0	21.3	0.0	18.2	0.0	4.6	2.5	18.5	34.9	4.9	17.3	17.3
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	25	390	332	516	0	646	46	1369	880	67	708	740
V/C Ratio(X)	0.56	0.85	0.00	0.89	0.00	0.15	0.74	0.51	0.71	0.98	0.38	0.38
Avail Cap(c_a), veh/h	67	555	472	838	0	945	67	1369	880	67	708	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.97	0.97	0.97
Uniform Delay (d), s/veh	58.7	45.2	0.0	48.4	0.0	24.8	57.9	27.1	18.3	59.1	37.8	37.9
Incr Delay (d2), s/veh	7.0	10.4	0.0	4.4	0.0	0.2	0.9	0.1	0.4	99.7	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.8	0.0	7.8	0.0	2.2	1.1	8.7	14.8	4.1	8.5	8.9
LnGrp Delay(d),s/veh	65.6	55.5	0.0	52.8	0.0	25.0	58.8	27.2	18.7	158.9	39.4	39.3
LnGrp LOS	E	E		D		C	E	C	B	F	D	D
Approach Vol, veh/h		347			559			1353			620	
Approach Delay, s/veh		55.9			47.8			24.1			52.1	
Approach LOS		E			D			C			D	

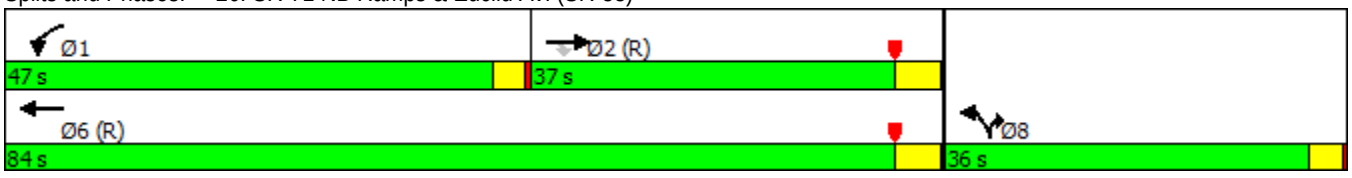
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	54.0	24.9	32.0	7.4	55.7	5.9	51.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	6.9	36.9	20.2	23.3	4.5	19.3	3.0	6.6
Green Ext Time (p_c), s	0.0	0.0	0.7	2.7	0.0	2.6	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	38.6
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	742	171	289	759	147	1078
Future Volume (vph)	742	171	289	759	147	1078
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	37.0	37.0	47.0	84.0	36.0	36.0
Total Split (%)	30.8%	30.8%	39.2%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	48.6	48.6	27.4	79.5	32.5	32.5
Actuated g/C Ratio	0.40	0.40	0.23	0.66	0.27	0.27
v/c Ratio	0.59	0.26	0.82	0.37	0.18	1.37
Control Delay	33.7	9.3	64.7	2.6	34.2	191.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	9.3	64.7	2.6	34.2	191.7
LOS	C	A	E	A	C	F
Approach Delay	29.1			19.7	172.9	
Approach LOS	C			B	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 81.3	Intersection LOS: F
Intersection Capacity Utilization 99.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	742	171	289	759	147	1078
Future Volume (veh/h)	742	171	289	759	147	1078
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	824	0	321	843	163	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2161	967	349	2957	229	105
Arrive On Green	1.00	0.00	0.20	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	824	0	321	843	163	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	22.0	5.3	5.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	22.0	5.3	5.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2161	967	349	2957	229	105
V/C Ratio(X)	0.38	0.00	0.92	0.29	0.71	0.00
Avail Cap(c_a), veh/h	2161	967	621	2957	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.82	0.82	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	46.8	1.5	54.7	0.0
Incr Delay (d2), s/veh	0.5	0.0	4.8	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	10.9	2.5	2.8	0.0
LnGrp Delay(d),s/veh	0.5	0.0	51.6	1.7	58.8	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	824			1164	163	
Approach Delay, s/veh	0.5			15.4	58.8	
Approach LOS	A			B	E	

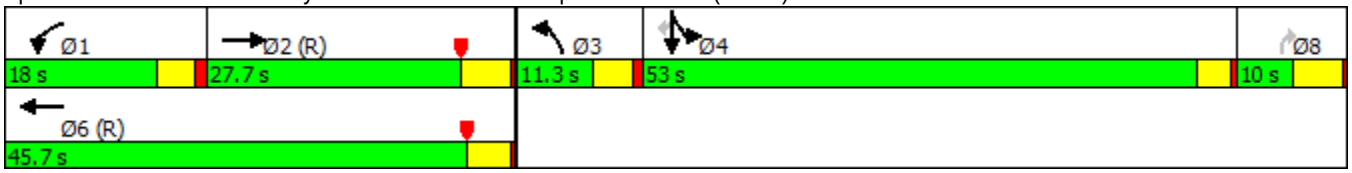
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	27.9	80.3				108.3		11.7
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	43.5	32.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	24.0	2.0				7.3		7.8
Green Ext Time (p_c), s	0.4	10.8				12.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	269	97	195	29	15	696	138	150
Future Volume (vph)	269	97	195	29	15	696	138	150
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	27.7	18.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.1%	15.0%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	38.0	11.8	54.9	6.5	5.0	40.4	40.4	40.4
Actuated g/C Ratio	0.32	0.10	0.46	0.05	0.04	0.34	0.34	0.34
v/c Ratio	0.30	0.63	0.13	0.34	0.08	0.82	0.78	0.25
Control Delay	34.6	63.3	13.7	65.7	0.8	49.5	45.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	63.3	13.7	65.7	0.8	49.5	45.7	4.5
LOS	C	E	B	E	A	D	D	A
Approach Delay	34.6		30.2				41.0	
Approach LOS	C		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 37.9	Intersection LOS: D
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	269	42	97	195	0	29	0	15	696	138	150
Future Volume (veh/h)	0	269	42	97	195	0	29	0	15	696	138	150
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	277	43	100	201	0	30	0	15	819	0	155
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1576	242	121	2196	0	0	0	0	929	0	439
Arrive On Green	0.00	0.53	0.53	0.15	1.00	0.00	0.00	0.00	0.00	0.29	0.00	0.29
Sat Flow, veh/h	0	3063	456	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	158	162	100	201	0		0.0		819	0	155
Grp Sat Flow(s),veh/h/ln	0	1710	1719	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	5.7	5.9	7.2	0.0	0.0				29.0	0.0	9.6
Cycle Q Clear(g_c), s	0.0	5.7	5.9	7.2	0.0	0.0				29.0	0.0	9.6
Prop In Lane	0.00		0.27	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	907	912	121	2196	0				929	0	439
V/C Ratio(X)	0.00	0.17	0.18	0.83	0.09	0.00				0.88	0.00	0.35
Avail Cap(c_a), veh/h	0	907	912	182	2196	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.6	14.6	50.3	0.0	0.0				40.8	0.0	33.9
Incr Delay (d2), s/veh	0.0	0.4	0.4	17.3	0.1	0.0				5.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.8	2.9	3.8	0.0	0.0				13.6	0.0	4.1
LnGrp Delay(d),s/veh	0.0	15.0	15.1	67.7	0.1	0.0				46.0	0.0	34.4
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		320			301						974	
Approach Delay, s/veh		15.0			22.5						44.1	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.4	68.6		37.9		82.1		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	13.5	22.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.2	7.9		31.0		2.0		
Green Ext Time (p_c), s	0.1	1.7		3.5		2.0		

Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1075	36	6	422	108	18
Future Volume (vph)	1075	36	6	422	108	18
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	72.7	72.7	5.0	74.3	14.3	14.3
Actuated g/C Ratio	0.73	0.73	0.05	0.74	0.14	0.14
v/c Ratio	0.89	0.03	0.09	0.34	0.51	0.09
Control Delay	23.4	3.1	52.5	5.9	47.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	3.1	52.5	5.9	47.5	15.7
LOS	C	A	D	A	D	B
Approach Delay	22.7			6.6	42.9	
Approach LOS	C			A	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 20.1	Intersection LOS: C
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1075	36	6	422	108	18
Future Volume (veh/h)	1075	36	6	422	108	18
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1168	39	7	459	117	20
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1252	1064	14	1363	185	175
Arrive On Green	0.70	0.70	0.01	0.76	0.11	0.11
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1168	39	7	459	117	20
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	49.3	0.7	0.4	7.3	6.0	1.0
Cycle Q Clear(g_c), s	49.3	0.7	0.4	7.3	6.0	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1252	1064	14	1363	185	175
V/C Ratio(X)	0.93	0.04	0.48	0.34	0.63	0.11
Avail Cap(c_a), veh/h	1480	1258	92	1677	499	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	4.2	43.2	3.5	37.1	34.9
Incr Delay (d2), s/veh	10.0	0.0	9.0	0.1	3.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.5	0.3	0.2	3.6	2.9	0.4
LnGrp Delay(d),s/veh	21.6	4.2	52.2	3.6	40.6	35.1
LnGrp LOS	C	A	D	A	D	D
Approach Vol, veh/h	1207			466	137	
Approach Delay, s/veh	21.0			4.3	39.8	
Approach LOS	C			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	67.2				72.6		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.4	51.3				9.3		8.0
Green Ext Time (p_c), s	0.0	9.7				2.7		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	22	0	126	39	3
Future Vol, veh/h	0	22	0	126	39	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	24	0	137	42	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	44	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	1032	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	1032	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1032	-	-
HCM Lane V/C Ratio	-	0.023	-	-
HCM Control Delay (s)	-	8.6	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	1	1	114	58	3
Future Vol, veh/h	12	1	1	114	58	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	1	1	124	63	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	191	65	66	0	-	0
Stage 1	65	-	-	-	-	-
Stage 2	126	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	803	1005	1549	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	802	1005	1549	-	-	-
Mov Cap-2 Maneuver	789	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1549	-	802	-	-
HCM Lane V/C Ratio	0.001	-	0.018	-	-
HCM Control Delay (s)	7.3	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	1	7	78	47	12
Future Vol, veh/h	37	1	7	78	47	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	40	1	8	85	51	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	158	58	64	0	-	0
Stage 1	58	-	-	-	-	-
Stage 2	100	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	838	1014	1551	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	834	1014	1551	-	-	-
Mov Cap-2 Maneuver	811	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	924	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1551	-	815	-	-
HCM Lane V/C Ratio	0.005	-	0.051	-	-
HCM Control Delay (s)	7.3	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	5	2	52	38	9
Future Vol, veh/h	32	5	2	52	38	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	35	5	2	57	41	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	107	46	51	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	61	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	895	1029	1568	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	967	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	894	1029	1568	-	-	-
Mov Cap-2 Maneuver	852	-	-	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	966	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1568	-	872	-	-
HCM Lane V/C Ratio	0.001	-	0.046	-	-
HCM Control Delay (s)	7.3	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	5	2	24	33	10
Future Vol, veh/h	30	5	2	24	33	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	5	2	26	36	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	71	41	47	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	938	1036	1573	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	937	1036	1573	-	-	-
Mov Cap-2 Maneuver	880	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	997	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1573	-	899	-	-
HCM Lane V/C Ratio	0.001	-	0.042	-	-
HCM Control Delay (s)	7.3	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	2	1	11	34	5
Future Vol, veh/h	14	2	1	11	34	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	15	2	1	12	37	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	54	40	42	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	959	1037	1580	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	958	1037	1580	-	-	-
Mov Cap-2 Maneuver	892	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	1013	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1580	-	908	-	-
HCM Lane V/C Ratio	0.001	-	0.019	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	310	118	2	6	30
Future Vol, veh/h	10	310	118	2	6	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	337	128	2	7	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	128	0	-	0	487	128
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1470	-	-	-	543	927
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	711	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1470	-	-	-	539	927
Mov Cap-2 Maneuver	-	-	-	-	650	-
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	706	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1470	-	-	-	650	927
HCM Lane V/C Ratio	0.007	-	-	-	0.01	0.035
HCM Control Delay (s)	7.5	-	-	-	10.6	9
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1093	0	0	428	0	0	0	0	0	0	0
Future Vol, veh/h	0	1093	0	0	428	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1151	0	0	451	0	0	0	0	0	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	451	0	-	-	-	0				1602	1602	451
Stage 1	-	-	-	-	-	-				451	451	-
Stage 2	-	-	-	-	-	-				1151	1151	-
Critical Hdwy	4.1	-	-	-	-	-				6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	1120	-	0	0	-	-				118	107	613
Stage 1	-	-	0	0	-	-				646	574	-
Stage 2	-	-	0	0	-	-				304	275	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1120	-	-	-	-	-				118	0	613
Mov Cap-2 Maneuver	-	-	-	-	-	-				233	0	-
Stage 1	-	-	-	-	-	-				646	0	-
Stage 2	-	-	-	-	-	-				304	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1120	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1062	40	2	402	12	5
Future Vol, veh/h	1062	40	2	402	12	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1142	43	2	432	13	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1185	0	1600	592
Stage 1	-	-	-	-	1163	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	596	-	108	454
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	596	-	108	454
Mov Cap-2 Maneuver	-	-	-	-	242	-
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	653	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	18.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	242	454	-	-	596	-
HCM Lane V/C Ratio	0.053	0.012	-	-	0.004	-
HCM Control Delay (s)	20.7	13	-	-	11.1	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	948	18	330	73	8
Future Volume (vph)	948	18	330	73	8
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	21.3	5.2	22.7	10.4	10.4
Actuated g/C Ratio	0.48	0.12	0.51	0.23	0.23
v/c Ratio	0.70	0.10	0.38	0.21	0.02
Control Delay	11.9	23.3	7.5	18.9	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	23.3	7.5	18.9	12.0
LOS	B	C	A	B	B
Approach Delay	11.9		8.3	18.3	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	948	119	18	330	73	8
Future Volume (veh/h)	948	119	18	330	73	8
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	998	125	19	347	77	6
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1373	172	38	1020	331	313
Arrive On Green	0.45	0.45	0.02	0.57	0.20	0.20
Sat Flow, veh/h	3138	382	1619	1800	1619	1530
Grp Volume(v), veh/h	560	563	19	347	77	6
Grp Sat Flow(s),veh/h/ln	1710	1719	1619	1800	1619	1530
Q Serve(g_s), s	13.2	13.2	0.6	5.1	2.0	0.2
Cycle Q Clear(g_c), s	13.2	13.2	0.6	5.1	2.0	0.2
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	770	775	38	1020	331	313
V/C Ratio(X)	0.73	0.73	0.51	0.34	0.23	0.02
Avail Cap(c_a), veh/h	1000	1006	167	1406	331	313
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	11.1	23.8	5.7	16.4	15.7
Incr Delay (d2), s/veh	1.9	1.9	3.9	0.2	1.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	6.5	0.3	2.6	1.0	0.1
LnGrp Delay(d),s/veh	13.0	13.0	27.7	5.9	18.1	15.8
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	1123			366	83	
Approach Delay, s/veh	13.0			7.1	17.9	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.7	28.5				34.2		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	2.6	15.2				7.1		4.0
Green Ext Time (p_c), s	0.0	7.0				10.3		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	883	33	284	65	21
Future Volume (vph)	883	33	284	65	21
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	20.8	5.7	24.1	10.6	10.6
Actuated g/C Ratio	0.45	0.12	0.52	0.23	0.23
v/c Ratio	0.70	0.18	0.32	0.19	0.06
Control Delay	13.4	25.3	6.4	20.6	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	25.3	6.4	20.6	13.7
LOS	B	C	A	C	B
Approach Delay	13.4		8.4	18.9	
Approach LOS	B		A	B	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 46.1			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 48.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	883	108	33	284	65	21
Future Volume (veh/h)	883	108	33	284	65	21
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	949	116	35	305	70	17
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1332	163	63	1025	335	317
Arrive On Green	0.44	0.44	0.04	0.57	0.21	0.21
Sat Flow, veh/h	3149	374	1619	1800	1619	1530
Grp Volume(v), veh/h	530	535	35	305	70	17
Grp Sat Flow(s),veh/h/ln	1710	1723	1619	1800	1619	1530
Q Serve(g_s), s	12.3	12.3	1.0	4.2	1.7	0.4
Cycle Q Clear(g_c), s	12.3	12.3	1.0	4.2	1.7	0.4
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	744	750	63	1025	335	317
V/C Ratio(X)	0.71	0.71	0.56	0.30	0.21	0.05
Avail Cap(c_a), veh/h	1016	1024	198	1461	335	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	22.8	5.4	15.9	15.4
Incr Delay (d2), s/veh	1.5	1.5	2.9	0.2	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	6.1	0.5	2.1	0.9	0.2
LnGrp Delay(d),s/veh	12.6	12.6	25.7	5.6	17.3	15.7
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	1065			340	87	
Approach Delay, s/veh	12.6			7.6	17.0	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.5	27.2				33.7		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.0	14.3				6.2		3.7
Green Ext Time (p_c), s	0.0	6.7				9.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	61	805	39	13	247	22	20	6	9	52	17	50
Future Vol, veh/h	61	805	39	13	247	22	20	6	9	52	17	50
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	65	856	41	14	263	23	21	6	10	55	18	53

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	286	0	0	902	0	0	1349	1325	453	863	1334	274
Stage 1	-	-	-	-	-	-	1011	1011	-	302	302	-
Stage 2	-	-	-	-	-	-	338	314	-	561	1032	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1288	-	-	762	-	-	120	157	559	264	155	770
Stage 1	-	-	-	-	-	-	260	320	-	712	668	-
Stage 2	-	-	-	-	-	-	681	660	-	485	313	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1288	-	-	762	-	-	99	146	557	241	144	770
Mov Cap-2 Maneuver	-	-	-	-	-	-	191	239	-	340	231	-
Stage 1	-	-	-	-	-	-	246	303	-	676	656	-
Stage 2	-	-	-	-	-	-	605	648	-	443	296	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.5	22.7	17.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	240	1288	-	-	762	-	-	408
HCM Lane V/C Ratio	0.155	0.05	-	-	0.018	-	-	0.31
HCM Control Delay (s)	22.7	7.9	-	-	9.8	-	-	17.7
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0.1	-	-	1.3

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	830	36	18	261	21	12
Future Vol, veh/h	830	36	18	261	21	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	943	41	20	297	24	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	984	0	1302	492
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	338	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	710	-	167	528
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	727	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	710	-	162	528
Mov Cap-2 Maneuver	-	-	-	-	306	-
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	707	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	16.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	361	-	-	710	-
HCM Lane V/C Ratio	0.104	-	-	0.029	-
HCM Control Delay (s)	16.1	-	-	10.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	55.2
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	841	0	0	0	0	0	279	0	0
Future Vol, veh/h	0	0	0	841	0	0	0	0	0	279	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	904	0	0	0	0	0	300	0	0
Number of Lanes	0	0	0	1	0	0	0	0	0	1	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay	68.5	15.2
HCM LOS	F	C

Lane	NBLn1	EBLn1
Vol Left, %	100%	0%
Vol Thru, %	0%	0%
Vol Right, %	0%	100%
Sign Control	Stop	Stop
Traffic Vol by Lane	279	841
LT Vol	279	0
Through Vol	0	0
RT Vol	0	841
Lane Flow Rate	300	904
Geometry Grp	1	1
Degree of Util (X)	0.499	1.062
Departure Headway (Hd)	6.191	4.227
Convergence, Y/N	Yes	Yes
Cap	585	859
Service Time	4.191	2.275
HCM Lane V/C Ratio	0.513	1.052
HCM Control Delay	15.2	68.5
HCM Lane LOS	C	F
HCM 95th-tile Q	2.8	21.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	0	0
Future Vol, veh/h	0	0	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	0	0
Number of Lanes	0	0	0	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

APPENDIX 5.2:

E+P (PHASE 2) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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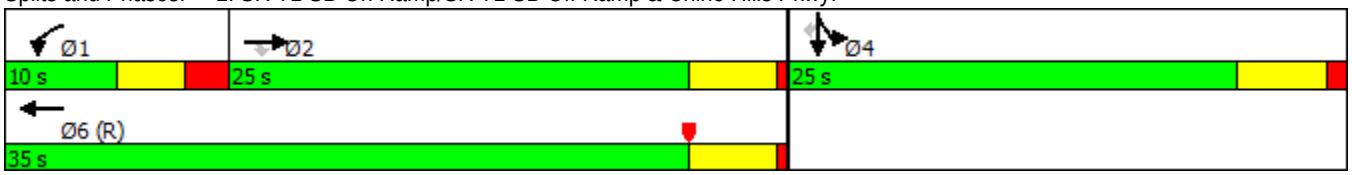
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1156	305	6	918	490	82	384
Future Volume (vph)	1156	305	6	918	490	82	384
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.41	0.36	0.04	0.54	0.57	0.54	0.67
Control Delay	11.5	3.2	28.2	9.5	21.9	20.7	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	3.2	28.2	9.5	21.9	20.7	18.7
LOS	B	A	C	A	C	C	B
Approach Delay	9.7			9.6		20.2	
Approach LOS	A			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 64.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1156	305	6	918	0	0	0	0	490	82	384
Future Volume (veh/h)	0	1156	305	6	918	0	0	0	0	490	82	384
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1192	244	6	946	0				566	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1192	244	6	946	0				566	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	8.3	6.6	0.2	8.5	0.0				8.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.3	6.6	0.2	8.5	0.0				8.5	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.46	0.38	0.47	0.54	0.00				0.52	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.75	0.75	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.6	12.1	29.6	6.2	0.0				16.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.4	7.2	0.9	0.0				1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	2.8	0.1	4.1	0.0				4.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.8	12.5	36.8	7.1	0.0				18.0	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1436			952						566	
Approach Delay, s/veh		12.7			7.3						18.0	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	10.3		10.5		10.5		
Green Ext Time (p_c), s	0.0	8.4		1.2		14.8		

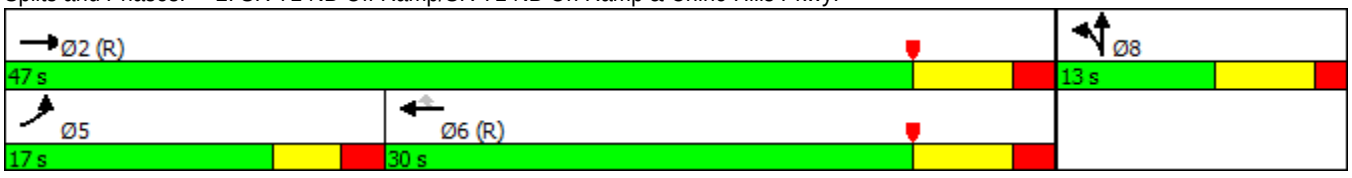
Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	537	1109	563	302	361	192
Future Volume (vph)	537	1109	563	302	361	192
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	17.0	47.0	30.0	30.0	13.0	13.0
Total Split (%)	28.3%	78.3%	50.0%	50.0%	21.7%	21.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	12.0	40.5	23.5	23.5	7.0	7.0
Actuated g/C Ratio	0.20	0.68	0.39	0.39	0.12	0.12
v/c Ratio	0.96	0.51	0.44	0.47	1.13	1.06
Control Delay	56.7	5.6	14.7	9.8	140.7	93.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	5.6	14.7	9.8	140.7	93.8
LOS	E	A	B	A	F	F
Approach Delay		22.2	13.0			109.2
Approach LOS		C	B			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 35.5	Intersection LOS: D
Intersection Capacity Utilization 64.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	537	1109	0	0	563	302	361	192	9	0	0	0
Future Volume (veh/h)	537	1109	0	0	563	302	361	192	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	565	1167	0	0	593	317	395	181	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	591	2308	0	0	1340	590	378	202	7			
Arrive On Green	0.20	0.68	0.00	0.00	0.39	0.39	0.12	0.12	0.12			
Sat Flow, veh/h	2956	3510	0	0	3510	1505	3238	1732	57			
Grp Volume(v), veh/h	565	1167	0	0	593	317	395	0	187			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1505	1619	0	1790			
Q Serve(g_s), s	11.3	10.1	0.0	0.0	7.7	9.7	7.0	0.0	6.2			
Cycle Q Clear(g_c), s	11.3	10.1	0.0	0.0	7.7	9.7	7.0	0.0	6.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	591	2309	0	0	1340	590	378	0	209			
V/C Ratio(X)	0.96	0.51	0.00	0.00	0.44	0.54	1.05	0.00	0.90			
Avail Cap(c_a), veh/h	591	2309	0	0	1340	590	378	0	209			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.72	0.72	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.7	4.8	0.0	0.0	13.4	14.1	26.5	0.0	26.1			
Incr Delay (d2), s/veh	24.6	0.7	0.0	0.0	0.8	2.5	58.7	0.0	39.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.6	4.9	0.0	0.0	3.7	4.4	6.2	0.0	5.4			
LnGrp Delay(d),s/veh	48.3	5.5	0.0	0.0	14.2	16.6	85.2	0.0	66.1			
LnGrp LOS	D	A			B	B	F		E			
Approach Vol, veh/h		1732			910			582				
Approach Delay, s/veh		19.5			15.0			79.1				
Approach LOS		B			B			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.0			17.0	30.0		13.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		40.5			12.0	23.5		7.0
Max Q Clear Time (g_c+I1), s		12.1			13.3	11.7		9.0
Green Ext Time (p_c), s		16.3			0.0	8.8		0.0

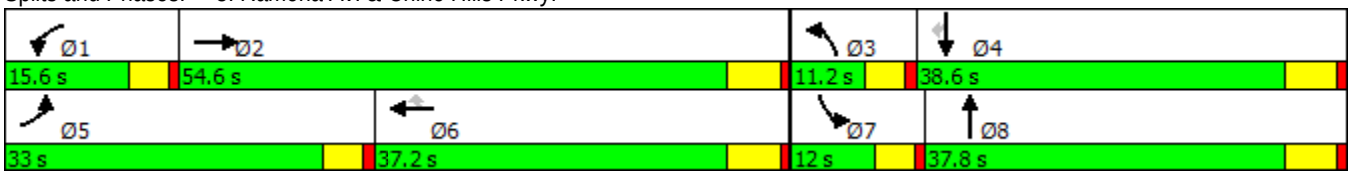
Intersection Summary	
HCM 2010 Ctrl Delay	29.0
HCM 2010 LOS	C

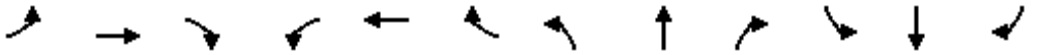
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	340	774	65	598	91	26	384	81	174	241
Future Volume (vph)	340	774	65	598	91	26	384	81	174	241
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	27.3	48.4	8.7	27.6	27.6	6.0	32.1	7.4	37.7	37.7
Actuated g/C Ratio	0.24	0.42	0.08	0.24	0.24	0.05	0.28	0.06	0.33	0.33
v/c Ratio	0.94	0.40	0.56	0.77	0.20	0.33	0.59	0.83	0.16	0.38
Control Delay	76.9	24.6	70.0	47.8	1.9	65.0	36.7	105.1	30.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.9	24.6	70.0	47.8	1.9	65.0	36.7	105.1	30.8	6.0
LOS	E	C	E	D	A	E	D	F	C	A
Approach Delay		40.5		44.2			38.0		30.8	
Approach LOS		D		D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 39.3	Intersection LOS: D
Intersection Capacity Utilization 88.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	774	4	65	598	91	26	384	144	81	174	241
Future Volume (veh/h)	340	774	4	65	598	91	26	384	144	81	174	241
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	358	815	3	68	629	79	27	404	84	85	183	158
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	2157	8	85	834	368	41	780	161	104	1080	475
Arrive On Green	0.24	0.43	0.43	0.05	0.24	0.24	0.03	0.28	0.28	0.06	0.32	0.32
Sat Flow, veh/h	1619	5054	19	1619	3420	1507	1619	2817	580	1619	3420	1504
Grp Volume(v), veh/h	358	528	290	68	629	79	27	244	244	85	183	158
Grp Sat Flow(s),veh/h/ln	1619	1638	1796	1619	1710	1507	1619	1710	1687	1619	1710	1504
Q Serve(g_s), s	25.1	12.7	12.7	4.8	19.7	4.8	1.9	13.9	14.2	6.0	4.5	9.3
Cycle Q Clear(g_c), s	25.1	12.7	12.7	4.8	19.7	4.8	1.9	13.9	14.2	6.0	4.5	9.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	381	1398	767	85	834	368	41	473	467	104	1080	475
V/C Ratio(X)	0.94	0.38	0.38	0.80	0.75	0.21	0.66	0.51	0.52	0.82	0.17	0.33
Avail Cap(c_a), veh/h	398	1398	767	154	929	409	92	473	467	104	1080	475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	22.6	22.6	54.2	40.5	34.9	55.9	35.2	35.3	53.4	28.6	30.2
Incr Delay (d2), s/veh	29.1	0.2	0.4	6.4	3.5	0.4	6.8	4.0	4.1	36.5	0.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	5.8	6.4	2.3	9.7	2.0	0.9	7.1	7.1	3.7	2.2	4.1
LnGrp Delay(d),s/veh	72.5	22.9	23.1	60.6	44.0	35.3	62.6	39.2	39.5	89.9	28.9	32.1
LnGrp LOS	E	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1176			776			515			426	
Approach Delay, s/veh		38.0			44.6			40.6			42.3	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	55.1	7.5	42.3	31.8	34.0	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	6.8	14.7	3.9	11.3	27.1	21.7	8.0	16.2
Green Ext Time (p_c), s	0.0	16.5	0.0	4.3	0.1	6.4	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	40.9
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	791	93	27	638	105	31
Future Vol, veh/h	791	93	27	638	105	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	869	102	30	701	115	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	869	0	1279	435
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	410	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	784	-	160	575
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	784	-	154	575
Mov Cap-2 Maneuver	-	-	-	-	329	-
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	619	-

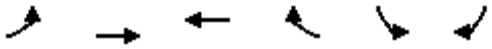
Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	21.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	365	-	-	784	-
HCM Lane V/C Ratio	0.409	-	-	0.038	-
HCM Control Delay (s)	21.5	-	-	9.8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.9	-	-	0.1	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	212	609	570	64	94
Future Volume (vph)	212	609	570	64	94
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	91.0	49.0	29.0	42.0
Total Split (%)	35.0%	75.8%	40.8%	24.2%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	16.1	43.5	22.7	23.6	40.9
Actuated g/C Ratio	0.20	0.55	0.29	0.30	0.52
v/c Ratio	0.70	0.35	0.67	0.08	0.12
Control Delay	41.9	9.9	28.5	24.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.9	9.9	28.5	24.0	2.5
LOS	D	A	C	C	A
Approach Delay		18.2	28.5	11.2	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 78.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 52.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	212	609	570	30	64	94
Future Volume (veh/h)	212	609	570	30	64	94
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	230	662	620	33	70	27
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	268	1928	1124	60	860	699
Arrive On Green	0.17	0.56	0.34	0.34	0.29	0.29
Sat Flow, veh/h	1619	3510	3393	176	2956	1530
Grp Volume(v), veh/h	230	662	321	332	70	27
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1769	1478	1530
Q Serve(g_s), s	11.0	8.4	12.1	12.2	1.4	0.8
Cycle Q Clear(g_c), s	11.0	8.4	12.1	12.2	1.4	0.8
Prop In Lane	1.00			0.10	1.00	1.00
Lane Grp Cap(c), veh/h	268	1928	582	602	860	699
V/C Ratio(X)	0.86	0.34	0.55	0.55	0.08	0.04
Avail Cap(c_a), veh/h	759	3653	926	958	860	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	9.4	21.4	21.4	20.5	12.0
Incr Delay (d2), s/veh	3.1	0.2	1.2	1.1	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	3.9	5.9	6.1	0.6	0.9
LnGrp Delay(d),s/veh	35.4	9.6	22.5	22.5	20.7	12.1
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		892	653		97	
Approach Delay, s/veh		16.2	22.5		18.3	
Approach LOS		B	C		B	

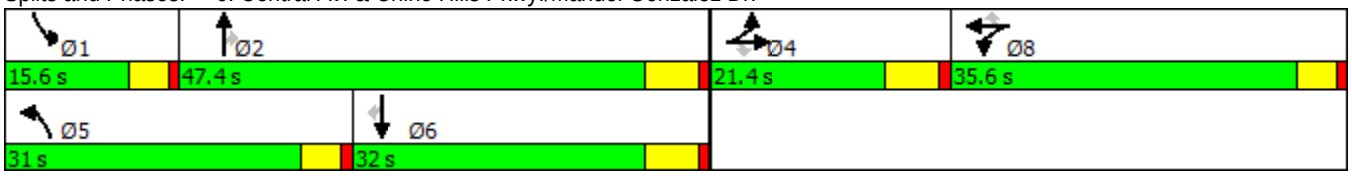
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		50.8		29.0	17.8	32.9		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	37.4	43.2		
Max Q Clear Time (g_c+I1), s		10.4		3.4	13.0	14.2		
Green Ext Time (p_c), s		16.9		0.2	0.3	13.0		

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	50	231	2	3	7	322	792	43	62	647	245
Future Volume (vph)	295	50	231	2	3	7	322	792	43	62	647	245
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.6	15.6	15.6	13.5	13.5	13.5	26.2	47.3	47.3	7.9	26.8	26.8
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.51	0.51	0.08	0.29	0.29
v/c Ratio	0.73	0.69	0.54	0.01	0.01	0.02	0.77	0.50	0.06	0.49	0.72	0.47
Control Delay	57.5	53.7	10.5	35.5	35.3	0.1	46.5	20.6	0.1	56.6	37.2	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	53.7	10.5	35.5	35.3	0.1	46.5	20.6	0.1	56.6	37.2	13.2
LOS	E	D	B	D	D	A	D	C	A	E	D	B
Approach Delay		37.5			13.7			27.0			32.3	
Approach LOS		D			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 93.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 31.1	Intersection LOS: C
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	295	50	231	2	3	7	322	792	43	62	647	245
Future Volume (veh/h)	295	50	231	2	3	7	322	792	43	62	647	245
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	360	0	155	2	3	3	350	861	35	67	703	211
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	464	0	219	33	37	31	387	1790	784	83	1147	507
Arrive On Green	0.14	0.00	0.14	0.02	0.02	0.02	0.24	0.52	0.52	0.05	0.34	0.34
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	360	0	155	2	3	3	350	861	35	67	703	211
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	8.5	0.0	7.7	0.1	0.1	0.2	16.7	12.8	0.9	3.3	13.7	8.6
Cycle Q Clear(g_c), s	8.5	0.0	7.7	0.1	0.1	0.2	16.7	12.8	0.9	3.3	13.7	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	464	0	219	33	37	31	387	1790	784	83	1147	507
V/C Ratio(X)	0.78	0.00	0.71	0.06	0.08	0.10	0.90	0.48	0.04	0.81	0.61	0.42
Avail Cap(c_a), veh/h	635	0	300	631	702	597	538	1790	784	224	1147	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	32.5	38.2	38.2	38.2	29.4	12.1	9.2	37.3	22.1	20.4
Incr Delay (d2), s/veh	4.1	0.0	4.6	0.8	0.9	1.3	12.2	0.9	0.1	6.7	2.4	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	3.5	0.0	0.1	0.1	8.7	6.2	0.4	1.6	6.8	3.9
LnGrp Delay(d),s/veh	36.9	0.0	37.1	39.0	39.2	39.5	41.6	13.0	9.4	44.1	24.5	22.9
LnGrp LOS	D		D	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		515			8			1246			981	
Approach Delay, s/veh		37.0			39.2			20.9			25.5	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	47.4		17.2	23.6	32.5		6.2
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.3	14.8		10.5	18.7	15.7		2.2
Green Ext Time (p_c), s	0.0	17.3		0.9	0.3	8.4		0.0

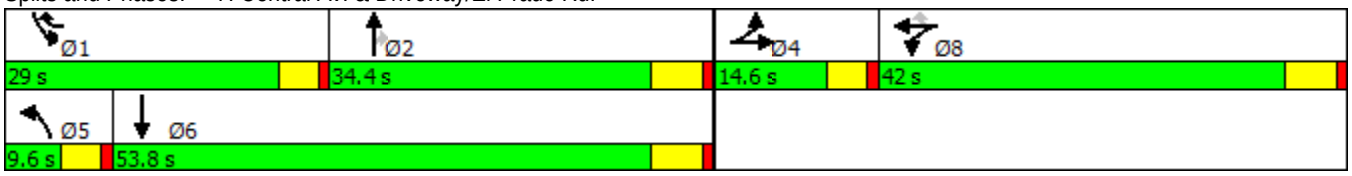
Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	900	3	444	2	738	564	354	603
Future Volume (vph)	1	1	900	3	444	2	738	564	354	603
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	0.97	0.92	0.47	0.03	0.91	0.73	1.08	0.27
Control Delay	48.0	41.0	70.8	59.5	6.4	53.0	53.7	8.6	110.9	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	70.8	59.5	6.4	53.0	53.7	8.6	110.9	16.2
LOS	D	D	E	E	A	D	D	A	F	B
Approach Delay		43.3		45.8			34.2			50.9
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 42.9	Intersection LOS: D
Intersection Capacity Utilization 91.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	900	3	444	2	738	564	354	603	9
Future Volume (veh/h)	1	1	1	900	3	444	2	738	564	354	603	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1002	0	350	2	820	458	393	670	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1052	0	834	4	884	391	357	2385	28
Arrive On Green	0.01	0.01	0.01	0.32	0.00	0.32	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5006	60
Grp Volume(v), veh/h	1	0	2	1002	0	350	2	820	458	393	438	240
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	33.5	0.0	14.9	0.1	25.9	28.6	24.4	8.9	9.0
Cycle Q Clear(g_c), s	0.1	0.0	0.1	33.5	0.0	14.9	0.1	25.9	28.6	24.4	8.9	9.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1052	0	834	4	884	391	357	1561	853
V/C Ratio(X)	0.08	0.00	0.15	0.95	0.00	0.42	0.46	0.93	1.17	1.10	0.28	0.28
Avail Cap(c_a), veh/h	146	0	150	1060	0	838	73	884	391	357	1561	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.5	0.0	54.5	36.5	0.0	14.8	55.1	40.0	41.0	43.1	17.5	17.5
Incr Delay (d2), s/veh	0.9	0.0	2.0	17.4	0.0	0.3	25.4	17.1	101.6	77.4	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	17.4	0.0	6.3	0.1	14.3	22.9	18.5	4.1	4.6
LnGrp Delay(d),s/veh	55.4	0.0	56.4	53.9	0.0	15.2	80.5	57.0	142.6	120.5	17.9	18.3
LnGrp LOS	E		E	D		B	F	E	F	F	B	B
Approach Vol, veh/h		3			1352			1280			1071	
Approach Delay, s/veh		56.1			43.9			87.7			55.7	
Approach LOS		E			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		41.7
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	11.0		35.5
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	21.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	62.4
HCM 2010 LOS	E

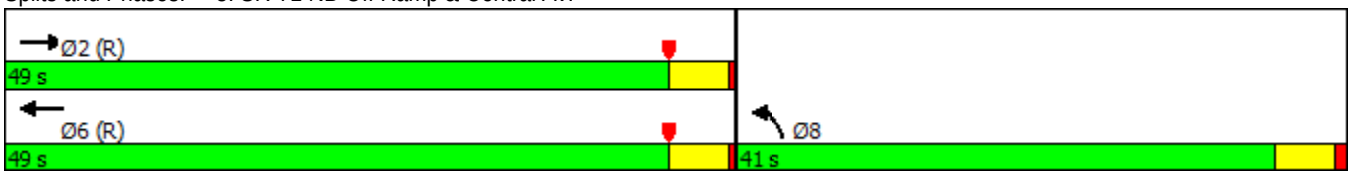
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1033	835	97
Future Volume (vph)	1033	835	97
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	49.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	59.2	59.2	21.3
Actuated g/C Ratio	0.66	0.66	0.24
v/c Ratio	0.69	0.31	1.17dr
Control Delay	6.5	7.5	37.9
Queue Delay	0.0	0.0	0.0
Total Delay	6.5	7.5	37.9
LOS	A	A	D
Approach Delay	6.5	7.5	37.9
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 63.1%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1033	764	0	835	97	364
Future Volume (veh/h)	1033	764	0	835	97	364
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1245	920	0	1006	117	246
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2326	1087	0	3490	298	282
Arrive On Green	1.00	1.00	0.00	0.71	0.18	0.18
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1245	920	0	1006	117	246
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	6.7	5.7	14.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.7	5.7	14.1
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2326	1087	0	3490	298	282
V/C Ratio(X)	0.54	0.85	0.00	0.29	0.39	0.87
Avail Cap(c_a), veh/h	2326	1087	0	3490	648	612
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.8	32.3	35.7
Incr Delay (d2), s/veh	0.9	8.2	0.0	0.2	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.5	0.0	3.0	2.6	6.2
LnGrp Delay(d),s/veh	0.9	8.2	0.0	5.0	32.6	39.0
LnGrp LOS	A	A		A	C	D
Approach Vol, veh/h	2165			1006	363	
Approach Delay, s/veh	4.0			5.0	36.9	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		68.4				68.4		21.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		36.0
Max Q Clear Time (g_c+I1), s		2.0				8.7		16.1
Green Ext Time (p_c), s		25.6				23.1		0.5

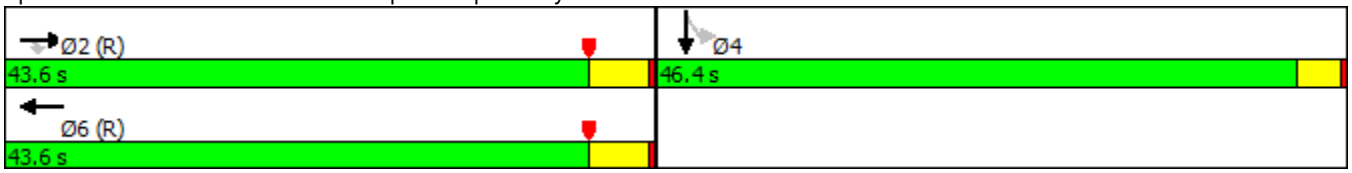
Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1313	69	740	484	0
Future Volume (vph)	1313	69	740	484	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	44.8	44.8	44.8	37.2	37.2
Actuated g/C Ratio	0.50	0.50	0.50	0.41	0.41
v/c Ratio	0.68	0.11	0.49	0.87	0.77
Control Delay	20.1	4.0	11.3	39.0	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	4.0	11.3	39.0	27.7
LOS	C	A	B	D	C
Approach Delay	19.3		11.3		33.6
Approach LOS	B		B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 20.7	Intersection LOS: C
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	↕	
Traffic Volume (veh/h)	0	1313	69	0	740	193	0	0	0	484	0	344
Future Volume (veh/h)	0	1313	69	0	740	193	0	0	0	484	0	344
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1662	0	0	937	244				454	223	294
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2761	860	0	2185	567				565	246	325
Arrive On Green	0.00	0.56	0.00	0.00	1.00	1.00				0.35	0.35	0.35
Sat Flow, veh/h	0	5076	1530	0	4050	1009				1619	706	930
Grp Volume(v), veh/h	0	1662	0	0	789	392				454	0	517
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1622				1619	0	1636
Q Serve(g_s), s	0.0	20.2	0.0	0.0	0.0	0.0				22.8	0.0	27.1
Cycle Q Clear(g_c), s	0.0	20.2	0.0	0.0	0.0	0.0				22.8	0.0	27.1
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.57
Lane Grp Cap(c), veh/h	0	2761	860	0	1841	911				565	0	571
V/C Ratio(X)	0.00	0.60	0.00	0.00	0.43	0.43				0.80	0.00	0.90
Avail Cap(c_a), veh/h	0	2761	860	0	1841	911				772	0	780
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.1	0.0	0.0	0.0	0.0				26.5	0.0	27.9
Incr Delay (d2), s/veh	0.0	1.0	0.0	0.0	0.7	1.5				3.0	0.0	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.3	0.0	0.0	0.2	0.4				10.7	0.0	13.7
LnGrp Delay(d),s/veh	0.0	14.0	0.0	0.0	0.7	1.5				29.5	0.0	37.2
LnGrp LOS		B			A	A				C		D
Approach Vol, veh/h		1662			1181						971	
Approach Delay, s/veh		14.0			1.0						33.6	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		55.1		34.9		55.1		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		22.2		29.1		2.0		
Green Ext Time (p_c), s		13.5		2.4		24.0		

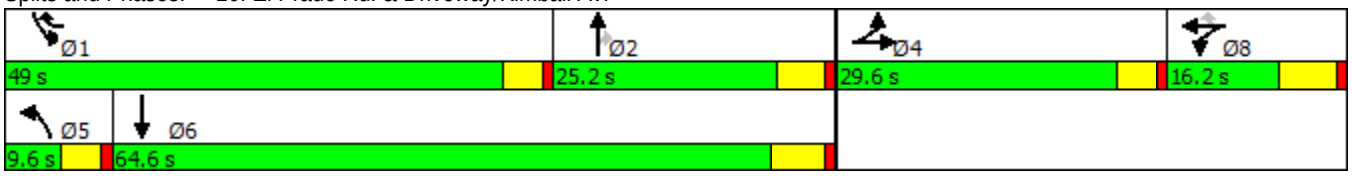
Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	1	25	1078	5	270	31	586	195
Future Volume (vph)	11	1	25	1078	5	270	31	586	195
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.4	58.3	5.2	19.1	19.1	46.0	59.2
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.62
v/c Ratio	0.05	0.01	0.28	0.93	0.06	0.76	0.07	0.76	0.12
Control Delay	40.1	30.3	49.4	23.7	52.6	53.8	0.3	32.6	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.3	49.4	23.7	52.6	53.8	0.3	32.6	9.3
LOS	D	C	D	C	D	D	A	C	A
Approach Delay		38.0	24.9			48.3			25.9
Approach LOS		D	C			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 105.8%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	2	27	25	1078	5	270	31	586	195	41
Future Volume (veh/h)	11	1	2	27	25	1078	5	270	31	586	195	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	1	1	28	26	239	5	276	32	598	199	42
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	51	26	26	113	105	788	100	343	291	634	1467	303
Arrive On Green	0.03	0.03	0.03	0.12	0.12	0.12	0.06	0.19	0.19	0.39	0.52	0.52
Sat Flow, veh/h	1619	827	827	910	845	1530	1619	1800	1530	1619	2822	584
Grp Volume(v), veh/h	11	0	2	54	0	239	5	276	32	598	119	122
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1696
Q Serve(g_s), s	0.5	0.0	0.1	2.2	0.0	7.2	0.2	11.8	1.4	28.7	2.9	3.0
Cycle Q Clear(g_c), s	0.5	0.0	0.1	2.2	0.0	7.2	0.2	11.8	1.4	28.7	2.9	3.0
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	51	0	52	217	0	788	100	343	291	634	889	882
V/C Ratio(X)	0.22	0.00	0.04	0.25	0.00	0.30	0.05	0.81	0.11	0.94	0.13	0.14
Avail Cap(c_a), veh/h	502	0	513	218	0	789	100	447	380	892	1248	1238
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	0.0	37.9	31.9	0.0	11.2	35.6	31.2	27.0	23.7	10.0	10.0
Incr Delay (d2), s/veh	2.1	0.0	0.3	0.6	0.0	0.2	0.1	8.0	0.2	12.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.1	0.0	3.1	0.1	6.6	0.6	15.0	1.4	1.4
LnGrp Delay(d),s/veh	40.2	0.0	38.2	32.5	0.0	11.4	35.6	39.2	27.1	36.2	10.1	10.1
LnGrp LOS	D		D	C		B	D	D	C	D	B	B
Approach Vol, veh/h		13			293			313			839	
Approach Delay, s/veh		39.9			15.3			37.9			28.7	
Approach LOS		D			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	36.1	21.1		7.1	9.6	47.7		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	30.7	13.8		2.5	2.2	5.0		9.2
Green Ext Time (p_c), s	0.8	1.5		0.0	0.0	3.1		0.1

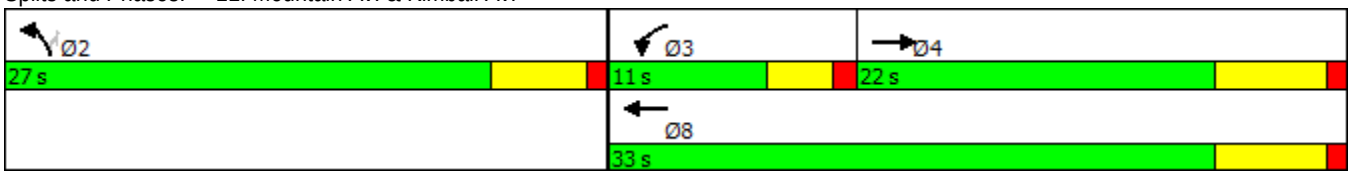
Intersection Summary	
HCM 2010 Ctrl Delay	28.1
HCM 2010 LOS	C

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	542	77	929	244	19
Future Volume (vph)	542	77	929	244	19
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	13.4	7.6	18.9	11.4	11.4
Actuated g/C Ratio	0.32	0.18	0.44	0.27	0.27
v/c Ratio	0.61	0.28	0.64	0.59	0.05
Control Delay	16.5	22.9	11.3	21.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	22.9	11.3	21.1	7.3
LOS	B	C	B	C	A
Approach Delay	16.5		12.1	20.1	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 42.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	542	90	77	929	244	19
Future Volume (veh/h)	542	90	77	929	244	19
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	565	89	80	968	254	15
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	885	139	169	1729	331	313
Arrive On Green	0.30	0.30	0.10	0.51	0.20	0.20
Sat Flow, veh/h	3053	465	1619	3510	1619	1530
Grp Volume(v), veh/h	325	329	80	968	254	15
Grp Sat Flow(s),veh/h/ln	1710	1718	1619	1710	1619	1530
Q Serve(g_s), s	6.4	6.5	1.8	7.6	5.8	0.3
Cycle Q Clear(g_c), s	6.4	6.5	1.8	7.6	5.8	0.3
Prop In Lane		0.27	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	511	513	169	1729	331	313
V/C Ratio(X)	0.64	0.64	0.47	0.56	0.77	0.05
Avail Cap(c_a), veh/h	703	706	291	2372	902	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	11.8	16.4	6.6	14.6	12.4
Incr Delay (d2), s/veh	0.5	0.5	0.8	0.1	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.1	0.8	3.5	2.7	0.1
LnGrp Delay(d),s/veh	12.3	12.3	17.2	6.7	16.0	12.5
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	654			1048	269	
Approach Delay, s/veh	12.3			7.5	15.8	
Approach LOS	B			A	B	

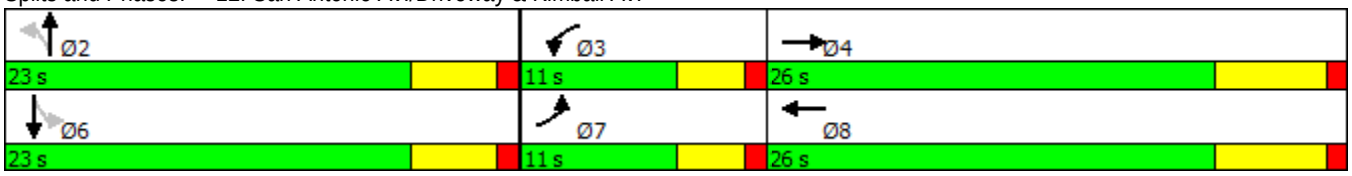
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.3	8.1	17.6				25.7
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		7.8	3.8	8.5				9.6
Green Ext Time (p_c), s		0.2	0.0	3.2				4.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	491	35	1011	42	0		
Future Volume (vph)	491	35	1011	42	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	26.0	11.0	26.0	23.0	23.0	23.0	11.0
Total Split (%)	43.3%	18.3%	43.3%	38.3%	38.3%	38%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	17.0	7.3	18.5	8.8	8.8		
Actuated g/C Ratio	0.44	0.19	0.48	0.23	0.23		
v/c Ratio	0.39	0.12	0.66	0.15	0.02		
Control Delay	9.7	18.2	10.3	14.5	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	9.7	18.2	10.3	14.5	0.1		
LOS	A	B	B	B	A		
Approach Delay	9.7		10.5		10.9		
Approach LOS	A		B		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 38.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 47.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	491	56	35	1011	0	42	0	14	0	0	0
Future Volume (veh/h)	0	491	56	35	1011	0	42	0	14	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	522	60	37	1076	0	45	0	12	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	5	984	113	98	1685	0	525	0	303	204	357	0
Arrive On Green	0.00	0.32	0.32	0.06	0.49	0.00	0.20	0.00	0.20	0.00	0.00	0.00
Sat Flow, veh/h	1619	3085	353	1619	3510	0	1619	0	1530	1345	1800	0
Grp Volume(v), veh/h	0	288	294	37	1076	0	45	0	12	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1729	1619	1710	0	1619	0	1530	1345	1800	0
Q Serve(g_s), s	0.0	4.9	4.9	0.8	8.2	0.0	0.8	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.9	4.9	0.8	8.2	0.0	0.8	0.0	0.2	0.0	0.0	0.0
Prop In Lane	1.00		0.20	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	5	546	552	98	1685	0	525	0	303	204	357	0
V/C Ratio(X)	0.00	0.53	0.53	0.38	0.64	0.00	0.09	0.00	0.04	0.00	0.00	0.00
Avail Cap(c_a), veh/h	321	969	980	321	1938	0	1034	0	785	627	923	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.8	9.9	15.9	6.6	0.0	11.7	0.0	11.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.3	2.3	0.4	3.8	0.0	0.4	0.0	0.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	10.1	10.2	16.8	7.0	0.0	11.7	0.0	11.4	0.0	0.0	0.0
LnGrp LOS		B	B	B	A		B		B			
Approach Vol, veh/h		582			1113			57			0	
Approach Delay, s/veh		10.1			7.3			11.6			0.0	
Approach LOS		B			A			B				

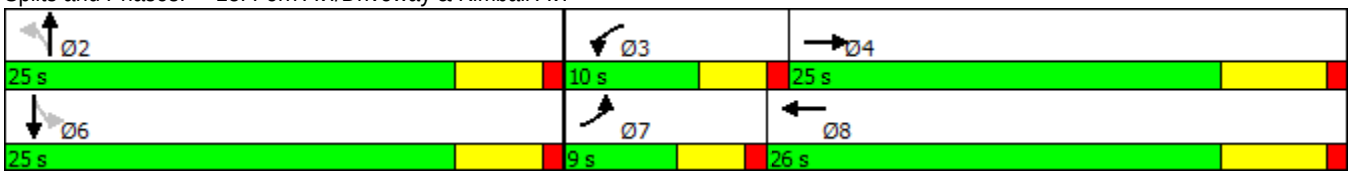
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.1	17.3		11.9	0.0	23.4
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		2.8	2.8	6.9		0.0	0.0	10.2
Green Ext Time (p_c), s		0.0	0.0	4.3		0.0	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	420	37	996	43	0	14	1
Future Volume (vph)	10	420	37	996	43	0	14	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.3	17.7	5.6	17.9	7.6	7.6	7.6	7.6
Actuated g/C Ratio	0.14	0.47	0.15	0.47	0.20	0.20	0.20	0.20
v/c Ratio	0.05	0.34	0.17	0.69	0.19	0.05	0.06	0.01
Control Delay	20.3	8.6	20.5	13.9	15.1	0.2	13.6	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	8.6	20.5	13.9	15.1	0.2	13.6	10.2
LOS	C	A	C	B	B	A	B	B
Approach Delay		8.8		14.1		9.6		13.0
Approach LOS		A		B		A		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 37.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	420	64	37	996	3	43	0	25	14	1	3
Future Volume (veh/h)	10	420	64	37	996	3	43	0	25	14	1	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	467	64	41	1107	3	48	0	18	16	1	2
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	23	1167	159	76	1468	4	402	0	221	388	78	155
Arrive On Green	0.01	0.39	0.39	0.05	0.42	0.42	0.14	0.00	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1619	3016	411	1619	3499	9	1356	0	1530	1338	537	1074
Grp Volume(v), veh/h	11	264	267	41	541	569	48	0	18	16	0	3
Grp Sat Flow(s),veh/h/ln	1619	1710	1717	1619	1710	1798	1356	0	1530	1338	0	1611
Q Serve(g_s), s	0.2	3.9	3.9	0.9	9.3	9.3	1.1	0.0	0.4	0.4	0.0	0.1
Cycle Q Clear(g_c), s	0.2	3.9	3.9	0.9	9.3	9.3	1.1	0.0	0.4	0.7	0.0	0.1
Prop In Lane	1.00		0.24	1.00		0.01	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	23	662	664	76	717	754	402	0	221	388	0	233
V/C Ratio(X)	0.47	0.40	0.40	0.54	0.75	0.75	0.12	0.00	0.08	0.04	0.00	0.01
Avail Cap(c_a), veh/h	234	953	957	281	1002	1054	993	0	888	971	0	935
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	7.7	7.7	16.1	8.5	8.5	13.2	0.0	12.8	13.1	0.0	12.7
Incr Delay (d2), s/veh	5.3	0.1	0.1	2.2	1.2	1.1	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.9	1.9	0.4	4.6	4.8	0.4	0.0	0.2	0.1	0.0	0.0
LnGrp Delay(d),s/veh	22.2	7.8	7.9	18.3	9.7	9.6	13.2	0.0	12.9	13.2	0.0	12.7
LnGrp LOS	C	A	A	B	A	A	B		B	B		B
Approach Vol, veh/h		542			1151			66			19	
Approach Delay, s/veh		8.1			10.0			13.1			13.1	
Approach LOS		A			A			B			B	

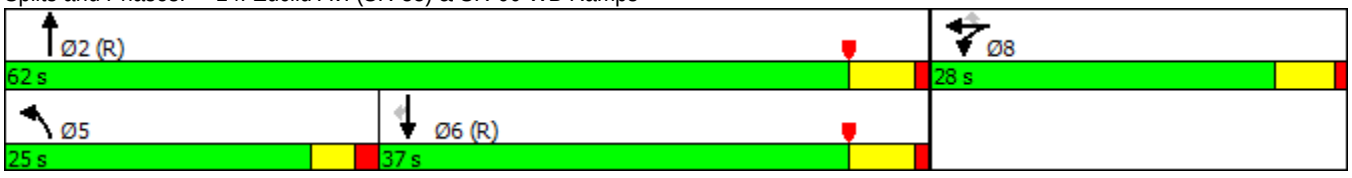
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	5.6	19.1		9.9	4.5	20.2
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.1	2.9	5.9		2.7	2.2	11.3
Green Ext Time (p_c), s		0.1	0.0	3.8		0.1	0.0	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	9.6
HCM 2010 LOS	A

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	635	2	364	300	898	966	461
Future Volume (vph)	635	2	364	300	898	966	461
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	22.9	22.9	22.9	19.7	56.6	32.4	32.4
Actuated g/C Ratio	0.25	0.25	0.25	0.22	0.63	0.36	0.36
v/c Ratio	0.96	0.93	0.70	0.92	0.45	0.84	0.59
Control Delay	72.5	63.7	26.6	50.3	18.9	34.7	5.4
Queue Delay	0.0	0.0	0.0	0.0	1.5	0.0	0.0
Total Delay	72.5	63.7	26.6	50.3	20.4	34.7	5.4
LOS	E	E	C	D	C	C	A
Approach Delay		55.3			27.9	25.2	
Approach LOS		E			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 34.4	Intersection LOS: C
Intersection Capacity Utilization 86.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	635	2	364	300	898	0	0	966	461
Future Volume (veh/h)	0	0	0	635	2	364	300	898	0	0	966	461
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				757	0	158	323	966	0	0	1039	496
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				816	0	386	345	2159	0	0	1258	542
Arrive On Green				0.25	0.00	0.25	0.43	1.00	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1474
Grp Volume(v), veh/h				757	0	158	323	966	0	0	1039	496
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1474
Q Serve(g_s), s				20.5	0.0	7.8	17.1	0.0	0.0	0.0	24.8	28.9
Cycle Q Clear(g_c), s				20.5	0.0	7.8	17.1	0.0	0.0	0.0	24.8	28.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				816	0	386	345	2159	0	0	1258	542
V/C Ratio(X)				0.93	0.00	0.41	0.93	0.45	0.00	0.00	0.83	0.91
Avail Cap(c_a), veh/h				828	0	391	369	2159	0	0	1258	542
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.58	0.58	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.9	0.0	28.1	25.2	0.0	0.0	0.0	25.8	27.1
Incr Delay (d2), s/veh				16.0	0.0	0.3	19.9	0.4	0.0	0.0	6.3	22.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.0	0.0	3.3	9.4	0.1	0.0	0.0	12.8	15.1
LnGrp Delay(d),s/veh				48.8	0.0	28.3	45.1	0.4	0.0	0.0	32.1	49.5
LnGrp LOS				D		C	D	A			C	D
Approach Vol, veh/h					915			1289			1535	
Approach Delay, s/veh					45.3			11.6			37.7	
Approach LOS					D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.3			23.7	38.6		27.7
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			19.1	30.9		22.5
Green Ext Time (p_c), s		39.7			0.1	0.6		0.1

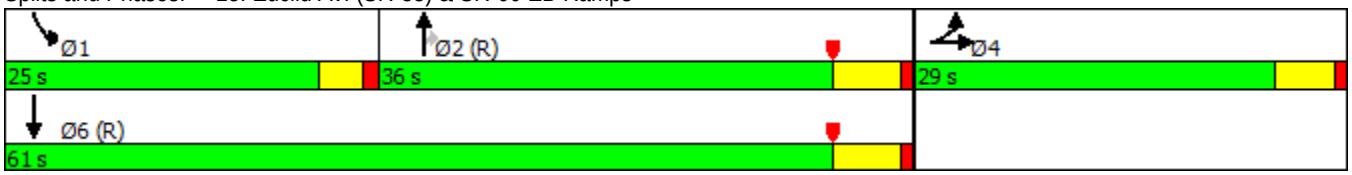
Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	324	0	873	547	287	1314
Future Volume (vph)	324	0	873	547	287	1314
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.9	22.9	33.3	33.3	19.3	56.6
Actuated g/C Ratio	0.25	0.25	0.37	0.37	0.21	0.63
v/c Ratio	0.80	0.94	0.73	0.64	0.88	0.65
Control Delay	47.6	59.1	29.7	5.7	53.0	5.3
Queue Delay	0.2	1.0	0.0	0.0	0.0	0.9
Total Delay	47.9	60.0	29.7	5.7	53.0	6.2
LOS	D	E	C	A	D	A
Approach Delay		54.8	20.4			14.6
Approach LOS		D	C			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 24.2	Intersection LOS: C
Intersection Capacity Utilization 86.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	324	0	350	0	0	0	0	873	547	287	1314	0
Future Volume (veh/h)	324	0	350	0	0	0	0	873	547	287	1314	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	317	39	289				0	929	582	305	1398	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	379	43	322				0	1363	607	334	2219	0
Arrive On Green	0.23	0.23	0.23				0.00	0.40	0.40	0.27	0.86	0.00
Sat Flow, veh/h	1619	185	1373				0	3510	1522	1619	3510	0
Grp Volume(v), veh/h	317	0	328				0	929	582	305	1398	0
Grp Sat Flow(s),veh/h/ln	1619	0	1558				0	1710	1522	1619	1710	0
Q Serve(g_s), s	16.8	0.0	18.4				0.0	20.2	33.5	16.4	11.0	0.0
Cycle Q Clear(g_c), s	16.8	0.0	18.4				0.0	20.2	33.5	16.4	11.0	0.0
Prop In Lane	1.00		0.88				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	379	0	365				0	1363	607	334	2219	0
V/C Ratio(X)	0.84	0.00	0.90				0.00	0.68	0.96	0.91	0.63	0.00
Avail Cap(c_a), veh/h	432	0	415				0	1363	607	378	2219	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.84	0.84	0.36	0.36	0.00
Uniform Delay (d), s/veh	32.8	0.0	33.4				0.0	22.4	26.4	31.9	2.9	0.0
Incr Delay (d2), s/veh	10.7	0.0	18.9				0.0	2.3	24.9	10.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	0.0	9.8				0.0	10.0	18.3	8.3	5.0	0.0
LnGrp Delay(d),s/veh	43.5	0.0	52.3				0.0	24.7	51.3	42.5	3.4	0.0
LnGrp LOS	D		D					C	D	D	A	
Approach Vol, veh/h		645						1511			1703	
Approach Delay, s/veh		48.0						34.9			10.4	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.5	41.4		26.1		63.9		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	18.4	35.5		20.4		13.0		
Green Ext Time (p_c), s	0.1	0.0		0.7		37.0		

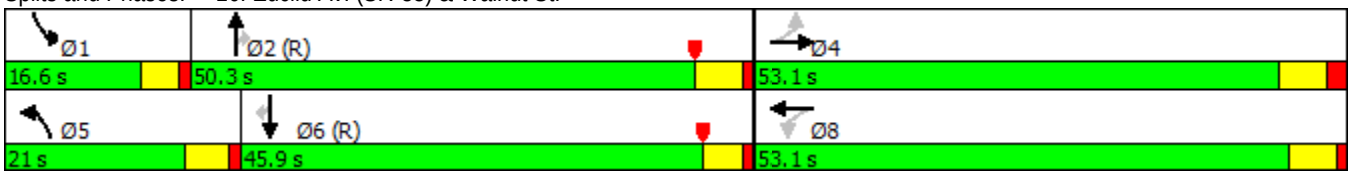
Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	147	326	84	301	102	1087	49	154	1239	56
Future Volume (vph)	147	326	84	301	102	1087	49	154	1239	56
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.0	33.0	34.0	34.0	12.7	60.4	60.4	10.5	58.5	58.5
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.11	0.50	0.50	0.09	0.49	0.49
v/c Ratio	0.97	0.48	0.47	0.50	0.63	0.46	0.06	0.63	0.54	0.08
Control Delay	106.9	33.2	40.7	28.1	64.2	13.6	5.7	64.0	25.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.9	33.2	40.7	28.1	64.2	13.6	5.7	64.0	25.1	4.7
LOS	F	C	D	C	E	B	A	E	C	A
Approach Delay		52.1		30.0		17.5			28.4	
Approach LOS		D		C		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 28.7	Intersection LOS: C
Intersection Capacity Utilization 73.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	326	101	84	301	168	102	1087	49	154	1239	56
Future Volume (veh/h)	147	326	101	84	301	168	102	1087	49	154	1239	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	155	343	84	88	317	144	107	1144	33	162	1304	30
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	258	906	219	276	760	337	131	2276	709	210	2211	687
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.03	0.15	0.15	0.07	0.45	0.45
Sat Flow, veh/h	892	2732	661	921	2292	1017	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	155	213	214	88	235	226	107	1144	33	162	1304	30
Grp Sat Flow(s),veh/h/ln	892	1710	1683	921	1710	1600	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	19.6	11.4	11.7	9.7	12.8	13.2	7.9	25.6	2.2	6.5	23.8	1.3
Cycle Q Clear(g_c), s	32.9	11.4	11.7	21.4	12.8	13.2	7.9	25.6	2.2	6.5	23.8	1.3
Prop In Lane	1.00		0.39	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	567	558	276	567	531	131	2276	709	210	2211	687
V/C Ratio(X)	0.60	0.38	0.38	0.32	0.41	0.43	0.82	0.50	0.05	0.77	0.59	0.04
Avail Cap(c_a), veh/h	310	667	656	337	681	637	217	2276	709	298	2211	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.52	0.52	0.52	0.71	0.71	0.71
Uniform Delay (d), s/veh	44.0	30.6	30.7	38.9	31.1	31.2	57.5	38.1	28.2	54.8	24.7	18.5
Incr Delay (d2), s/veh	2.3	0.4	0.4	0.7	0.5	0.5	6.4	0.4	0.1	3.2	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	5.4	5.5	2.5	6.1	5.9	3.8	11.8	1.0	2.7	10.9	0.6
LnGrp Delay(d),s/veh	46.3	31.0	31.1	39.6	31.5	31.8	63.9	38.6	28.3	58.0	25.5	18.6
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	C	B
Approach Vol, veh/h		582			549			1284			1496	
Approach Delay, s/veh		35.1			32.9			40.4			28.9	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	60.9		46.1	14.6	59.3		46.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	8.5	27.6		34.9	9.9	25.8		23.4
Green Ext Time (p_c), s	0.1	12.5		4.9	0.1	11.5		6.7

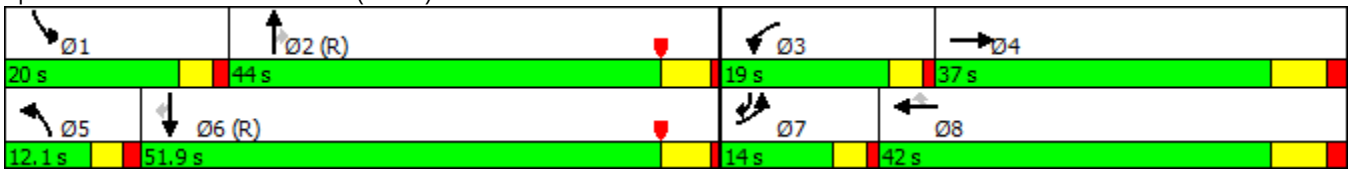
Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	318	174	373	49	62	948	166	175	1111	145
Future Volume (vph)	139	318	174	373	49	62	948	166	175	1111	145
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	37.0	19.0	42.0	42.0	12.1	44.0	44.0	20.0	51.9	14.0
Total Split (%)	11.7%	30.8%	15.8%	35.0%	35.0%	10.1%	36.7%	36.7%	16.7%	43.3%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.2	21.5	15.1	24.5	24.5	9.5	43.6	43.6	18.7	55.0	72.6
Actuated g/C Ratio	0.10	0.18	0.13	0.20	0.20	0.08	0.36	0.36	0.16	0.46	0.60
v/c Ratio	0.90	0.64	0.90	0.56	0.12	0.51	0.80	0.26	0.73	0.75	0.16
Control Delay	102.0	48.7	93.9	45.3	0.6	79.4	34.9	5.3	73.3	18.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.0	48.7	93.9	45.3	0.6	79.4	34.9	5.3	73.3	18.2	1.7
LOS	F	D	F	D	A	E	C	A	E	B	A
Approach Delay		63.1		55.7			33.1			23.2	
Approach LOS		E		E			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 37.1	Intersection LOS: D
Intersection Capacity Utilization 78.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	318	54	174	373	49	62	948	166	175	1111	145
Future Volume (veh/h)	139	318	54	174	373	49	62	948	166	175	1111	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	146	335	34	183	393	47	65	998	94	184	1169	87
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	519	52	202	709	317	81	1395	624	205	1657	869
Arrive On Green	0.08	0.17	0.17	0.13	0.21	0.21	0.07	0.54	0.54	0.25	0.97	0.97
Sat Flow, veh/h	1619	3133	316	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	146	182	187	183	393	47	65	998	94	184	1169	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1739	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	10.0	11.9	12.1	13.4	12.3	3.0	4.8	26.2	3.7	13.2	4.1	0.2
Cycle Q Clear(g_c), s	10.0	11.9	12.1	13.4	12.3	3.0	4.8	26.2	3.7	13.2	4.1	0.2
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	283	288	202	709	317	81	1395	624	205	1657	869
V/C Ratio(X)	1.08	0.64	0.65	0.90	0.55	0.15	0.80	0.72	0.15	0.90	0.71	0.10
Avail Cap(c_a), veh/h	135	428	435	202	998	446	103	1395	624	209	1657	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.85	0.85	0.83	0.83	0.83
Uniform Delay (d), s/veh	55.0	46.7	46.8	51.8	42.6	38.9	55.4	22.3	17.1	44.1	1.0	0.7
Incr Delay (d2), s/veh	101.2	3.4	3.5	37.2	1.0	0.3	25.6	2.7	0.4	31.2	2.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	5.9	6.1	8.1	5.9	1.3	2.7	12.7	1.6	7.6	1.5	0.1
LnGrp Delay(d),s/veh	156.2	50.1	50.3	88.9	43.5	39.2	81.1	24.9	17.5	75.2	3.2	0.9
LnGrp LOS	F	D	D	F	D	D	F	C	B	E	A	A
Approach Vol, veh/h		515			623			1157			1440	
Approach Delay, s/veh		80.3			56.6			27.5			12.2	
Approach LOS		F			E			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	54.4	19.0	26.9	10.5	63.6	14.0	31.9
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	38.5	15.0	30.0	7.6	46.4	10.0	35.0
Max Q Clear Time (g_c+I1), s	15.2	28.2	15.4	14.1	6.8	6.1	12.0	14.3
Green Ext Time (p_c), s	0.0	8.4	0.0	5.6	0.0	22.5	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	97	119	51	62	155	56	1020	132	28	1205	95
Future Volume (vph)	97	119	51	62	155	56	1020	132	28	1205	95
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	25.2	25.2	25.2		25.2	8.8	75.0	75.0	6.8	71.2	71.2
Actuated g/C Ratio	0.21	0.21	0.21		0.21	0.07	0.62	0.62	0.06	0.59	0.59
v/c Ratio	0.66	0.33	0.14		0.80	0.50	0.50	0.14	0.32	0.63	0.11
Control Delay	62.2	41.0	2.5		61.4	76.2	9.8	2.5	41.4	34.8	14.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	41.0	2.5		61.4	76.2	9.8	2.5	41.4	34.8	14.3
LOS	E	D	A		E	E	A	A	D	C	B
Approach Delay		41.3			61.4		12.1			33.4	
Approach LOS		D			E		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 28.0	Intersection LOS: C
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	119	51	62	155	35	56	1020	132	28	1205	95
Future Volume (veh/h)	97	119	51	62	155	35	56	1020	132	28	1205	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	102	125	30	65	163	33	59	1074	103	29	1268	71
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	197	389	326	100	213	40	73	2123	950	42	2057	919
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.09	1.00	1.00	0.01	0.20	0.20
Sat Flow, veh/h	1139	1800	1510	289	985	184	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	102	125	30	261	0	0	59	1074	103	29	1268	71
Grp Sat Flow(s),veh/h/ln	1139	1800	1510	1458	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	0.7	7.0	1.9	14.0	0.0	0.0	4.3	0.0	0.0	2.1	40.6	4.5
Cycle Q Clear(g_c), s	21.8	7.0	1.9	21.0	0.0	0.0	4.3	0.0	0.0	2.1	40.6	4.5
Prop In Lane	1.00		1.00	0.25		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	389	326	352	0	0	73	2123	950	42	2057	919
V/C Ratio(X)	0.52	0.32	0.09	0.74	0.00	0.00	0.81	0.51	0.11	0.69	0.62	0.08
Avail Cap(c_a), veh/h	303	555	466	499	0	0	169	2123	950	101	2057	919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.76	0.76	0.76	0.55	0.55	0.55
Uniform Delay (d), s/veh	45.8	39.6	37.6	45.6	0.0	0.0	54.1	0.0	0.0	59.0	35.5	21.0
Incr Delay (d2), s/veh	2.1	0.5	0.1	3.6	0.0	0.0	5.8	0.7	0.2	4.2	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.6	0.8	8.7	0.0	0.0	2.0	0.2	0.0	1.0	19.5	1.9
LnGrp Delay(d),s/veh	47.9	40.1	37.8	49.1	0.0	0.0	59.9	0.7	0.2	63.2	36.2	21.1
LnGrp LOS	D	D	D	D			E	A	A	E	D	C
Approach Vol, veh/h		257			261			1236			1368	
Approach Delay, s/veh		42.9			49.1			3.4			36.0	
Approach LOS		D			D			A			D	

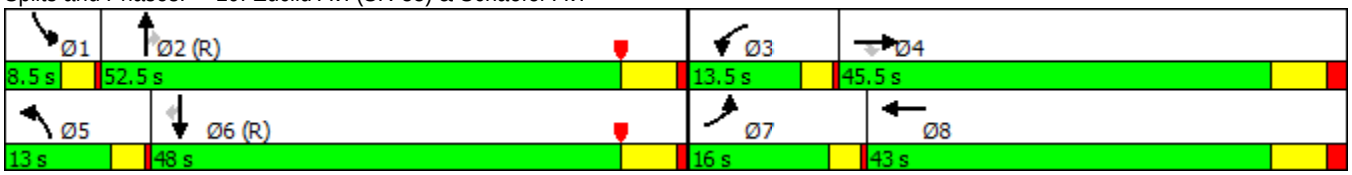
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	80.5		32.9	8.9	78.2		32.9
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.1	2.0		23.8	6.3	42.6		23.0
Green Ext Time (p_c), s	0.0	28.8		2.1	0.0	9.4		2.2

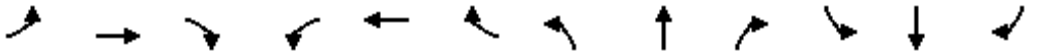
Intersection Summary		
HCM 2010 Ctrl Delay		24.8
HCM 2010 LOS		C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	134	59	86	54	114	95	1081	19	14	1150	127
Future Volume (vph)	134	59	86	54	114	95	1081	19	14	1150	127
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.1	22.0	22.0	10.0	17.2	11.2	70.5	70.5	5.4	59.5	59.5
Actuated g/C Ratio	0.10	0.18	0.18	0.08	0.14	0.09	0.59	0.59	0.04	0.50	0.50
v/c Ratio	0.88	0.19	0.24	0.43	0.54	0.67	0.57	0.02	0.21	0.72	0.17
Control Delay	98.5	40.9	3.7	62.6	51.0	56.7	27.3	1.0	50.5	38.6	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.5	40.9	3.7	62.6	51.0	56.7	27.3	1.0	50.5	38.6	14.1
LOS	F	D	A	E	D	E	C	A	D	D	B
Approach Delay		57.2			54.4		29.3			36.3	
Approach LOS		E			D		C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 36.6	Intersection LOS: D
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	59	86	54	114	17	95	1081	19	14	1150	127
Future Volume (veh/h)	134	59	86	54	114	17	95	1081	19	14	1150	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	143	63	39	57	121	16	101	1150	15	15	1223	87
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	166	237	201	115	155	21	123	2102	940	27	1899	830
Arrive On Green	0.10	0.13	0.13	0.07	0.10	0.10	0.05	0.41	0.41	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1558	206	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	143	63	39	57	0	137	101	1150	15	15	1223	87
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	10.4	3.8	2.7	4.1	0.0	9.1	7.4	30.6	0.7	1.1	39.7	5.8
Cycle Q Clear(g_c), s	10.4	3.8	2.7	4.1	0.0	9.1	7.4	30.6	0.7	1.1	39.7	5.8
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	166	237	201	115	0	176	123	2102	940	27	1899	830
V/C Ratio(X)	0.86	0.27	0.19	0.50	0.00	0.78	0.82	0.55	0.02	0.57	0.64	0.10
Avail Cap(c_a), veh/h	169	578	491	135	0	529	128	2102	940	67	1899	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.66	0.66	0.66	0.76	0.76	0.76
Uniform Delay (d), s/veh	53.0	46.9	46.5	53.7	0.0	52.7	56.2	22.6	13.8	59.2	38.0	24.2
Incr Delay (d2), s/veh	31.8	0.4	0.3	1.2	0.0	5.5	21.7	0.7	0.0	5.3	1.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	1.9	1.2	1.9	0.0	4.7	4.1	14.7	0.3	0.5	19.2	2.5
LnGrp Delay(d),s/veh	84.8	47.4	46.8	54.9	0.0	58.3	77.9	23.3	13.8	64.5	39.3	24.4
LnGrp LOS	F	D	D	D		E	E	C	B	E	D	C
Approach Vol, veh/h		245			194			1266			1325	
Approach Delay, s/veh		69.1			57.3			27.5			38.6	
Approach LOS		E			E			C			D	

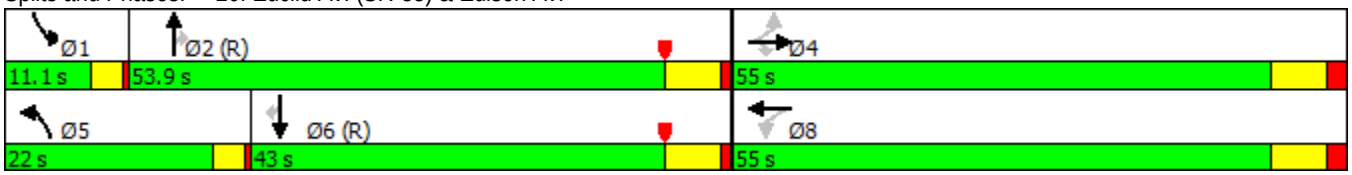
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	79.8	12.0	22.8	12.6	72.6	15.8	18.9
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.1	32.6	6.1	5.8	9.4	41.7	12.4	11.1
Green Ext Time (p_c), s	0.0	11.1	0.0	0.9	0.0	0.2	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	206	158	159	64	328	185	919	34	39	972	237
Future Volume (vph)	206	158	159	64	328	185	919	34	39	972	237
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.0	43.0	43.0	43.0	43.0	17.0	55.4	55.4	6.7	43.5	43.5
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.14	0.46	0.46	0.06	0.36	0.36
v/c Ratio	1.01	0.26	0.26	0.18	0.61	0.86	0.62	0.05	0.46	0.84	0.38
Control Delay	101.8	27.1	4.4	25.5	34.7	68.6	34.8	7.0	91.9	23.8	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.8	27.1	4.4	25.5	34.7	68.6	34.8	7.0	91.9	23.8	4.4
LOS	F	C	A	C	C	E	C	A	F	C	A
Approach Delay		49.6			33.3		39.5			22.2	
Approach LOS		D			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 33.8	Intersection LOS: C
Intersection Capacity Utilization 93.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	158	159	64	328	38	185	919	34	39	972	237
Future Volume (veh/h)	206	158	159	64	328	38	185	919	34	39	972	237
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	219	168	102	68	349	38	197	978	21	41	1034	221
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	282	720	612	420	638	69	221	1475	660	50	1115	498
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.14	0.43	0.43	0.06	0.65	0.65
Sat Flow, veh/h	956	1800	1530	1064	1595	174	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	219	168	102	68	0	387	197	978	21	41	1034	221
Grp Sat Flow(s),veh/h/ln	956	1800	1530	1064	0	1769	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	27.4	7.4	5.1	5.4	0.0	20.2	14.4	27.3	0.9	3.0	31.9	8.5
Cycle Q Clear(g_c), s	47.6	7.4	5.1	12.8	0.0	20.2	14.4	27.3	0.9	3.0	31.9	8.5
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	282	720	612	420	0	708	221	1475	660	50	1115	498
V/C Ratio(X)	0.78	0.23	0.17	0.16	0.00	0.55	0.89	0.66	0.03	0.81	0.93	0.44
Avail Cap(c_a), veh/h	282	720	612	420	0	708	250	1475	660	103	1115	498
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.90	0.90	0.90	0.68	0.68	0.68
Uniform Delay (d), s/veh	45.9	23.8	23.1	28.1	0.0	27.6	50.9	27.2	19.7	55.9	19.6	15.6
Incr Delay (d2), s/veh	12.9	0.2	0.1	0.2	0.0	0.9	24.5	2.1	0.1	7.8	10.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	3.7	2.2	1.6	0.0	10.0	7.9	13.3	0.4	1.5	16.3	3.7
LnGrp Delay(d),s/veh	58.8	24.0	23.3	28.2	0.0	28.5	75.4	29.3	19.7	63.8	30.2	17.5
LnGrp LOS	E	C	C	C		C	E	C	B	E	C	B
Approach Vol, veh/h		489			455			1196			1296	
Approach Delay, s/veh		39.4			28.5			36.7			29.1	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	57.8		55.0	19.9	45.1		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.0	29.3		49.6	16.4	33.9		22.2
Green Ext Time (p_c), s	0.0	12.6		0.0	0.1	2.7		5.1

Intersection Summary	
HCM 2010 Ctrl Delay	33.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	52	7	140	19	43	131	1063	6	21	1140	26
Future Volume (vph)	52	7	140	19	43	131	1063	6	21	1140	26
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	21.0	63.5	63.5	9.7	52.2	52.2
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	17.5%	52.9%	52.9%	8.1%	43.5%	43.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.6	15.6	15.6	15.6	15.6	14.2	87.7	87.7	6.2	76.2	76.2
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.12	0.73	0.73	0.05	0.64	0.64
v/c Ratio	0.35	0.03	0.45	0.12	0.31	0.72	0.44	0.01	0.27	0.55	0.03
Control Delay	48.6	36.7	9.9	40.8	28.9	76.6	5.9	0.2	75.6	8.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	36.7	9.9	40.8	28.9	76.6	5.9	0.2	75.6	8.2	1.1
LOS	D	D	A	D	C	E	A	A	E	A	A
Approach Delay		20.9			31.4		13.5			9.2	
Approach LOS		C			C		B			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	7	140	19	43	30	131	1063	6	21	1140	26
Future Volume (veh/h)	52	7	140	19	43	30	131	1063	6	21	1140	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	7	60	20	45	24	136	1107	6	22	1188	23
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	140	182	155	185	112	60	160	2601	1164	35	2337	1023
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.76	0.76	0.01	0.23	0.23
Sat Flow, veh/h	1278	1800	1530	1280	1106	590	1619	3420	1530	1619	3420	1497
Grp Volume(v), veh/h	54	7	60	20	0	69	136	1107	6	22	1188	23
Grp Sat Flow(s),veh/h/ln	1278	1800	1530	1280	0	1696	1619	1710	1530	1619	1710	1497
Q Serve(g_s), s	5.0	0.4	4.4	1.7	0.0	4.6	9.9	13.7	0.1	1.6	36.5	1.4
Cycle Q Clear(g_c), s	9.5	0.4	4.4	2.1	0.0	4.6	9.9	13.7	0.1	1.6	36.5	1.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	182	155	185	0	171	160	2601	1164	35	2337	1023
V/C Ratio(X)	0.38	0.04	0.39	0.11	0.00	0.40	0.85	0.43	0.01	0.63	0.51	0.02
Avail Cap(c_a), veh/h	458	630	535	504	0	594	236	2601	1164	84	2337	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh	55.0	48.7	50.5	49.6	0.0	50.5	53.2	5.1	3.5	59.1	28.8	15.3
Incr Delay (d2), s/veh	1.3	0.1	1.2	0.2	0.0	1.1	14.8	0.5	0.0	8.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.2	1.9	0.6	0.0	2.2	5.1	6.6	0.0	0.8	17.5	0.6
LnGrp Delay(d),s/veh	56.3	48.7	51.6	49.8	0.0	51.7	68.0	5.6	3.5	67.3	29.3	15.3
LnGrp LOS	E	D	D	D		D	E	A	A	E	C	B
Approach Vol, veh/h		121			89			1249			1233	
Approach Delay, s/veh		53.6			51.3			12.4			29.7	
Approach LOS		D			D			B			C	

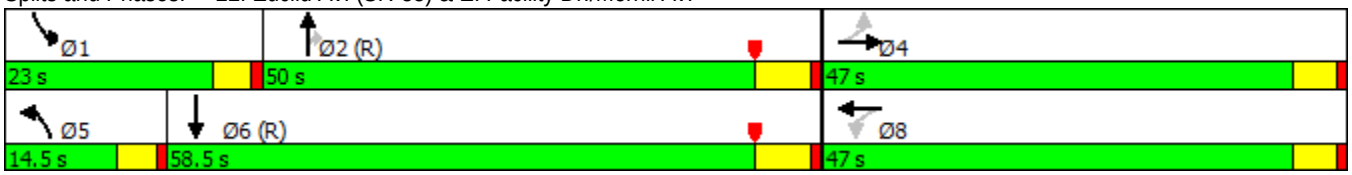
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	97.0		16.9	15.4	87.7		16.9
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	57.8		42.0	17.5	46.5		42.0
Max Q Clear Time (g_c+I1), s	3.6	15.7		11.5	11.9	38.5		6.6
Green Ext Time (p_c), s	0.0	23.0		0.6	0.1	6.7		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	23.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	162	46	19	991	105	165	1121
Future Volume (vph)	8	6	162	46	19	991	105	165	1121
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		35.8		35.8	10.0	52.7	52.7	15.9	67.4
Actuated g/C Ratio		0.30		0.30	0.08	0.44	0.44	0.13	0.56
v/c Ratio		0.04		0.91	0.15	0.69	0.15	0.80	0.63
Control Delay		22.6		60.2	55.5	22.4	2.8	68.0	18.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.6		60.2	55.5	22.4	2.8	68.0	18.3
LOS		C		E	E	C	A	E	B
Approach Delay		22.6		60.2		21.1			24.4
Approach LOS		C		E		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 85.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	162	46	191	19	991	105	165	1121	42
Future Volume (veh/h)	8	6	4	162	46	191	19	991	105	165	1121	42
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	169	48	153	20	1032	83	172	1168	41
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	182	131	58	223	55	166	66	1655	740	196	1904	67
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.04	0.48	0.48	0.12	0.56	0.56
Sat Flow, veh/h	521	492	217	677	207	623	1619	3420	1530	1619	3371	118
Grp Volume(v), veh/h	17	0	0	370	0	0	20	1032	83	172	592	617
Grp Sat Flow(s),veh/h/ln	1230	0	0	1507	0	0	1619	1710	1530	1619	1710	1779
Q Serve(g_s), s	0.0	0.0	0.0	27.8	0.0	0.0	1.4	26.8	3.6	12.5	27.7	27.7
Cycle Q Clear(g_c), s	0.9	0.0	0.0	28.7	0.0	0.0	1.4	26.8	3.6	12.5	27.7	27.7
Prop In Lane	0.47		0.18	0.46		0.41	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	371	0	0	444	0	0	66	1655	740	196	966	1005
V/C Ratio(X)	0.05	0.00	0.00	0.83	0.00	0.00	0.30	0.62	0.11	0.88	0.61	0.61
Avail Cap(c_a), veh/h	491	0	0	571	0	0	135	1655	740	250	966	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.49	0.49	0.49	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	0.0	42.8	0.0	0.0	55.9	22.9	16.9	51.8	17.4	17.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	6.6	0.0	0.0	0.5	0.9	0.1	20.3	2.9	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	12.7	0.0	0.0	0.7	12.8	1.5	6.7	13.8	14.3
LnGrp Delay(d),s/veh	32.7	0.0	0.0	49.4	0.0	0.0	56.4	23.8	17.0	72.1	20.3	20.2
LnGrp LOS	C			D			E	C	B	E	C	C
Approach Vol, veh/h		17			370			1135			1381	
Approach Delay, s/veh		32.7			49.4			23.8			26.7	
Approach LOS		C			D			C			C	

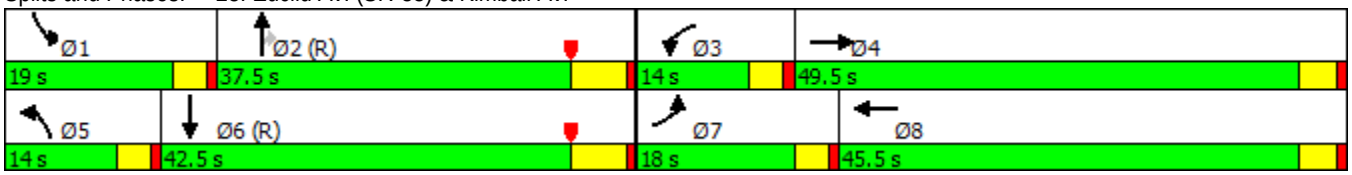
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.1	64.1		36.9	9.4	73.8		36.9
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	14.5	28.8		2.9	3.4	29.7		30.7
Green Ext Time (p_c), s	0.1	11.1		1.4	0.0	14.9		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	135	312	33	648	97	652	49	304	598
Future Volume (vph)	135	312	33	648	97	652	49	304	598
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	12.9	45.8	10.0	37.3	10.5	28.8	28.8	22.4	40.7
Actuated g/C Ratio	0.11	0.38	0.08	0.31	0.09	0.24	0.24	0.19	0.34
v/c Ratio	0.80	0.27	0.25	0.90	0.70	0.81	0.11	1.03	0.81
Control Delay	82.9	25.8	56.7	48.6	62.1	50.0	5.9	100.6	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.9	25.8	56.7	48.6	62.1	50.0	5.9	100.6	28.7
LOS	F	C	E	D	E	D	A	F	C
Approach Delay		42.1		48.9		48.7			46.7
Approach LOS		D		D		D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 47.1	Intersection LOS: D
Intersection Capacity Utilization 90.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	312	25	33	648	282	97	652	49	304	598	310
Future Volume (veh/h)	135	312	25	33	648	282	97	652	49	304	598	310
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	138	318	24	34	661	266	99	665	42	310	610	278
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	1134	85	91	735	296	130	1069	478	202	813	370
Arrive On Green	0.10	0.35	0.35	0.06	0.31	0.31	0.03	0.10	0.10	0.13	0.36	0.36
Sat Flow, veh/h	1619	3225	242	1619	2382	959	1619	3420	1530	1619	2275	1036
Grp Volume(v), veh/h	138	168	174	34	474	453	99	665	42	310	458	430
Grp Sat Flow(s),veh/h/ln	1619	1710	1757	1619	1710	1631	1619	1710	1530	1619	1710	1602
Q Serve(g_s), s	10.1	8.5	8.6	2.4	31.9	31.9	7.3	22.4	3.0	15.0	28.2	28.3
Cycle Q Clear(g_c), s	10.1	8.5	8.6	2.4	31.9	31.9	7.3	22.4	3.0	15.0	28.2	28.3
Prop In Lane	1.00		0.14	1.00		0.59	1.00		1.00	1.00		0.65
Lane Grp Cap(c), veh/h	162	601	618	91	527	503	130	1069	478	202	611	572
V/C Ratio(X)	0.85	0.28	0.28	0.37	0.90	0.90	0.76	0.62	0.09	1.53	0.75	0.75
Avail Cap(c_a), veh/h	189	641	659	135	584	557	135	1069	478	202	611	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	0.84	0.84	0.84	0.73	0.73	0.73
Uniform Delay (d), s/veh	53.2	28.0	28.0	54.6	39.7	39.7	57.3	47.0	38.3	52.5	33.9	33.9
Incr Delay (d2), s/veh	23.2	0.2	0.2	0.9	15.0	15.6	16.5	2.3	0.3	256.8	6.1	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	4.0	4.2	1.1	17.2	16.5	3.9	10.9	1.3	21.1	14.4	13.6
LnGrp Delay(d),s/veh	76.3	28.2	28.2	55.5	54.7	55.3	73.8	49.3	38.6	309.3	40.0	40.4
LnGrp LOS	E	C	C	E	D	E	E	D	D	F	D	D
Approach Vol, veh/h		480			961			806			1198	
Approach Delay, s/veh		42.0			55.0			51.8			109.8	
Approach LOS		D			E			D			F	

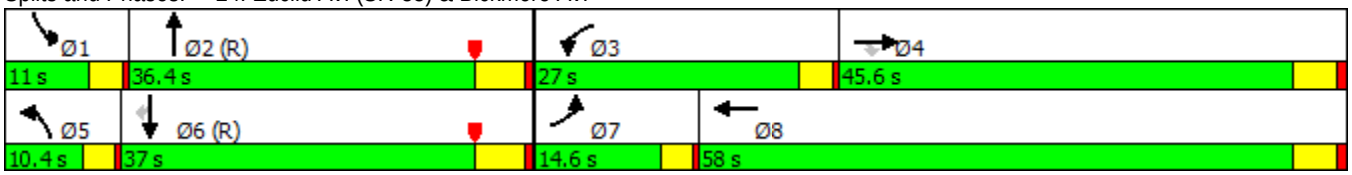
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	43.5	10.8	46.7	13.6	48.9	16.0	41.5
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	24.4	4.4	10.6	9.3	30.3	12.1	33.9
Green Ext Time (p_c), s	0.0	4.7	0.0	5.7	0.0	4.2	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	71.5
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	65	18	24	191	365	29	535	46	505	74
Future Volume (vph)	65	18	24	191	365	29	535	46	505	74
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.0	24.7	24.7	30.4	44.0	6.4	45.7	7.3	48.4	48.4
Actuated g/C Ratio	0.08	0.21	0.21	0.25	0.37	0.05	0.38	0.06	0.40	0.40
v/c Ratio	0.57	0.05	0.06	0.50	0.89	0.36	0.51	0.50	0.39	0.12
Control Delay	71.8	29.9	0.3	46.1	49.9	37.7	19.4	71.7	12.1	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	29.9	0.3	46.1	49.9	37.7	19.4	71.7	12.1	3.9
LOS	E	C	A	D	D	D	B	E	B	A
Approach Delay		48.5			48.9		20.3		15.5	
Approach LOS		D			D		C		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 30.2	Intersection LOS: C
Intersection Capacity Utilization 73.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	18	24	191	365	171	29	535	83	46	505	74
Future Volume (veh/h)	65	18	24	191	365	171	29	535	83	46	505	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	69	19	24	203	388	169	31	569	87	49	537	70
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	86	469	398	228	415	181	43	1235	188	61	1456	651
Arrive On Green	0.05	0.26	0.26	0.14	0.35	0.35	0.01	0.14	0.14	0.01	0.14	0.14
Sat Flow, veh/h	1619	1800	1528	1619	1190	518	1619	2976	454	1619	3420	1530
Grp Volume(v), veh/h	69	19	24	203	0	557	31	326	330	49	537	70
Grp Sat Flow(s),veh/h/ln	1619	1800	1528	1619	0	1709	1619	1710	1720	1619	1710	1530
Q Serve(g_s), s	5.1	0.9	1.4	14.8	0.0	37.8	2.3	21.1	21.2	3.6	17.1	4.8
Cycle Q Clear(g_c), s	5.1	0.9	1.4	14.8	0.0	37.8	2.3	21.1	21.2	3.6	17.1	4.8
Prop In Lane	1.00		1.00	1.00		0.30	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	86	469	398	228	0	595	43	709	714	61	1456	651
V/C Ratio(X)	0.80	0.04	0.06	0.89	0.00	0.94	0.71	0.46	0.46	0.80	0.37	0.11
Avail Cap(c_a), veh/h	150	609	517	317	0	755	93	709	714	101	1456	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.70	0.70	0.70	0.52	0.52	0.52
Uniform Delay (d), s/veh	56.2	33.2	33.3	50.6	0.0	37.8	59.0	39.4	39.4	58.8	37.0	31.7
Incr Delay (d2), s/veh	6.4	0.0	0.0	16.2	0.0	15.0	5.5	1.5	1.5	4.7	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.5	0.6	7.6	0.0	20.3	1.1	10.3	10.4	1.7	8.2	2.1
LnGrp Delay(d),s/veh	62.6	33.2	33.3	66.9	0.0	52.8	64.5	40.9	40.9	63.5	37.3	31.8
LnGrp LOS	E	C	C	E		D	E	D	D	E	D	C
Approach Vol, veh/h		112			760			687			656	
Approach Delay, s/veh		51.3			56.6			42.0			38.7	
Approach LOS		D			E			D			D	

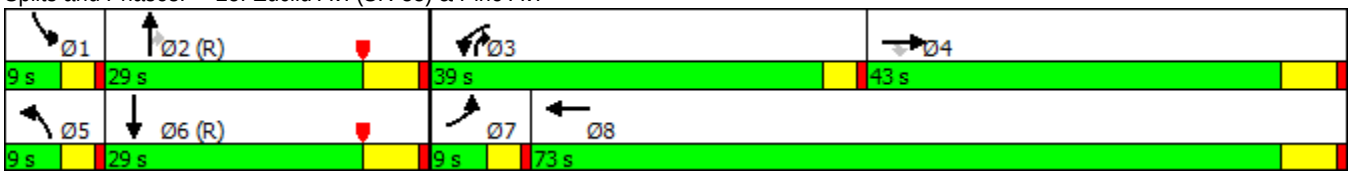
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	55.3	20.4	36.3	6.7	56.6	9.9	46.8
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	5.6	23.2	16.8	3.4	4.3	19.1	7.1	39.8
Green Ext Time (p_c), s	0.0	2.8	0.1	2.4	0.0	3.6	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	208	32	841	159	56	641	470	60	639
Future Volume (vph)	5	208	32	841	159	56	641	470	60	639
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	22.3	22.3	35.0	59.5	8.2	34.0	71.0	8.7	34.5
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.28	0.59	0.07	0.29
v/c Ratio	0.07	0.63	0.08	0.99	0.28	0.52	0.67	0.45	0.52	0.67
Control Delay	57.8	52.2	0.4	70.3	15.2	73.0	46.8	2.8	58.5	33.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.2	0.4	70.3	15.2	73.0	46.8	2.8	58.5	33.0
LOS	E	D	A	E	B	E	D	A	E	C
Approach Delay		45.6			58.2		30.4			35.1
Approach LOS		D			E		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 42.0	Intersection LOS: D
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	208	32	841	159	77	56	641	470	60	639	14
Future Volume (veh/h)	5	208	32	841	159	77	56	641	470	60	639	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	210	0	849	161	63	57	647	297	61	645	9
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	280	238	862	541	212	67	1179	962	67	1190	17
Arrive On Green	0.01	0.16	0.00	0.29	0.44	0.44	0.04	0.34	0.34	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1228	480	1619	3420	1496	1619	3452	48
Grp Volume(v), veh/h	5	210	0	849	0	224	57	647	297	61	319	335
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1708	1619	1710	1496	1619	1710	1790
Q Serve(g_s), s	0.4	13.4	0.0	34.2	0.0	10.1	4.2	18.3	10.8	4.5	21.2	21.2
Cycle Q Clear(g_c), s	0.4	13.4	0.0	34.2	0.0	10.1	4.2	18.3	10.8	4.5	21.2	21.2
Prop In Lane	1.00		1.00	1.00		0.28	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	280	238	862	0	752	67	1179	962	67	589	617
V/C Ratio(X)	0.48	0.75	0.00	0.98	0.00	0.30	0.84	0.55	0.31	0.90	0.54	0.54
Avail Cap(c_a), veh/h	67	555	472	862	0	954	67	1179	962	67	589	617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.62	0.62	0.62	0.92	0.92	0.92
Uniform Delay (d), s/veh	59.4	48.5	0.0	42.2	0.0	21.6	57.1	31.8	9.9	58.9	44.2	44.2
Incr Delay (d2), s/veh	12.4	5.7	0.0	26.7	0.0	0.3	40.7	1.1	0.5	71.6	3.3	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.1	0.0	17.1	0.0	4.9	2.6	8.8	4.6	3.4	10.6	11.1
LnGrp Delay(d),s/veh	71.8	54.2	0.0	69.0	0.0	21.9	97.9	32.9	10.4	130.6	47.5	47.4
LnGrp LOS	E	D		E		C	F	C	B	F	D	D
Approach Vol, veh/h		215			1073			1001			715	
Approach Delay, s/veh		54.6			59.1			29.9			54.5	
Approach LOS		D			E			C			D	

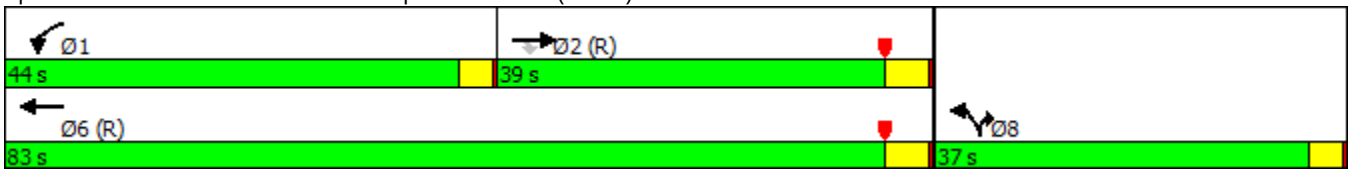
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	47.4	39.0	24.6	9.0	47.4	4.8	58.9
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	6.5	20.3	36.2	15.4	6.2	23.2	2.4	12.1
Green Ext Time (p_c), s	0.0	1.5	0.0	3.2	0.0	0.0	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	48.0
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	488	289	552	950	69	711
Future Volume (vph)	488	289	552	950	69	711
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	39.0	39.0	44.0	83.0	37.0	37.0
Total Split (%)	32.5%	32.5%	36.7%	69.2%	30.8%	30.8%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	43.7	43.7	44.0	91.1	20.9	20.9
Actuated g/C Ratio	0.36	0.36	0.37	0.76	0.17	0.17
v/c Ratio	0.41	0.40	0.92	0.38	0.12	0.94
Control Delay	52.7	24.8	51.6	0.4	38.0	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	24.8	51.6	0.4	38.0	27.0
LOS	D	C	D	A	D	C
Approach Delay	42.3			19.2	28.0	
Approach LOS	D			B	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 27.3	Intersection LOS: C
Intersection Capacity Utilization 67.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	488	289	552	950	69	711
Future Volume (veh/h)	488	289	552	950	69	711
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	508	0	575	990	72	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1796	803	579	3050	139	64
Arrive On Green	1.00	0.00	0.34	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	508	0	575	990	72	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	40.1	5.3	2.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	40.1	5.3	2.5	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1796	803	579	3050	139	64
V/C Ratio(X)	0.28	0.00	0.99	0.32	0.52	0.00
Avail Cap(c_a), veh/h	1796	803	579	3050	928	427
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.44	0.44	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	39.6	1.0	56.3	0.0
Incr Delay (d2), s/veh	0.4	0.0	23.3	0.1	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	22.8	2.4	1.2	0.0
LnGrp Delay(d),s/veh	0.4	0.0	62.9	1.1	59.3	0.0
LnGrp LOS	A		E	A	E	
Approach Vol, veh/h	508			1565	72	
Approach Delay, s/veh	0.4			23.8	59.3	
Approach LOS	A			C	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	44.0	67.5				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	40.5	34.5				78.5		33.5
Max Q Clear Time (g_c+I1), s	42.1	2.0				7.3		4.5
Green Ext Time (p_c), s	0.0	9.6				10.6		0.2

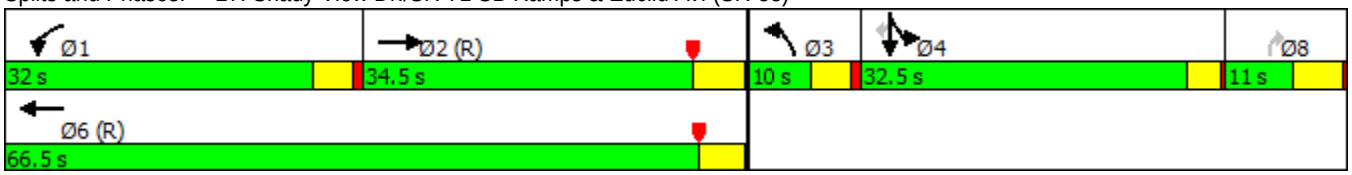
Intersection Summary	
HCM 2010 Ctrl Delay	19.5
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	747	381	205	60	288	256	20	35
Future Volume (vph)	747	381	205	60	288	256	20	35
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	34.5	32.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	28.8%	26.7%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	29.5	37.2	71.7	5.5	7.1	18.2	18.2	18.2
Actuated g/C Ratio	0.25	0.31	0.60	0.05	0.06	0.15	0.15	0.15
v/c Ratio	1.00	0.84	0.11	0.89	0.82	0.66	0.61	0.11
Control Delay	76.4	63.6	4.2	134.9	23.4	60.1	56.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	63.6	4.2	134.9	23.4	60.1	56.7	0.6
LOS	E	E	A	F	C	E	E	A
Approach Delay	76.4		42.8				51.9	
Approach LOS	E		D				D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 57.0 — Intersection LOS: E
Intersection Capacity Utilization 71.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	747	16	381	205	0	60	0	288	256	20	35
Future Volume (veh/h)	0	747	16	381	205	0	60	0	288	256	20	35
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	821	18	419	225	0	66	0	316	297	0	38
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1876	41	371	2787	0	0	0	0	370	0	175
Arrive On Green	0.00	0.55	0.55	0.38	1.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11
Sat Flow, veh/h	0	3512	75	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	410	429	419	225	0		0.0		297	0	38
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	17.1	17.1	27.5	0.0	0.0				10.7	0.0	2.7
Cycle Q Clear(g_c), s	0.0	17.1	17.1	27.5	0.0	0.0				10.7	0.0	2.7
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	937	979	371	2787	0				370	0	175
V/C Ratio(X)	0.00	0.44	0.44	1.13	0.08	0.00				0.80	0.00	0.22
Avail Cap(c_a), veh/h	0	937	979	371	2787	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.1	16.1	37.0	0.0	0.0				51.8	0.0	48.3
Incr Delay (d2), s/veh	0.0	1.5	1.4	86.6	0.1	0.0				4.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.5	8.8	21.1	0.0	0.0				5.0	0.0	1.2
LnGrp Delay(d),s/veh	0.0	17.6	17.5	123.7	0.1	0.0				55.9	0.0	48.9
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		839			644						335	
Approach Delay, s/veh		17.6			80.5						55.1	
Approach LOS		B			F						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	32.0	70.8		17.2		102.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	27.5	29.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	29.5	19.1		12.7		2.0		
Green Ext Time (p_c), s	0.0	3.1		1.0		4.4		

Intersection Summary	
HCM 2010 Ctrl Delay	46.8
HCM 2010 LOS	D

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	493	189	13	1039	37	3
Future Volume (vph)	493	189	13	1039	37	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	58.3	58.3	9.6	67.9	32.1	32.1
Total Split (%)	58.3%	58.3%	9.6%	67.9%	32.1%	32.1%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	60.4	60.4	5.0	62.0	13.0	13.0
Actuated g/C Ratio	0.70	0.70	0.06	0.72	0.15	0.15
v/c Ratio	0.43	0.18	0.15	0.87	0.17	0.01
Control Delay	8.9	1.8	45.2	20.5	32.5	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	1.8	45.2	20.5	32.5	19.3
LOS	A	A	D	C	C	B
Approach Delay	7.0			20.8	31.5	
Approach LOS	A			C	C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 86.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 75.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	493	189	13	1039	37	3
Future Volume (veh/h)	493	189	13	1039	37	3
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	536	205	14	1129	40	3
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1132	962	27	1276	221	209
Arrive On Green	0.63	0.63	0.02	0.71	0.14	0.14
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	536	205	14	1129	40	3
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	11.5	4.2	0.6	35.8	1.6	0.1
Cycle Q Clear(g_c), s	11.5	4.2	0.6	35.8	1.6	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1132	962	27	1276	221	209
V/C Ratio(X)	0.47	0.21	0.51	0.89	0.18	0.01
Avail Cap(c_a), veh/h	1283	1090	111	1519	598	565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.2	5.8	35.6	8.3	27.9	27.3
Incr Delay (d2), s/veh	0.3	0.1	5.4	5.8	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	1.8	0.3	19.3	0.7	0.1
LnGrp Delay(d),s/veh	7.5	5.9	41.0	14.2	28.3	27.3
LnGrp LOS	A	A	D	B	C	C
Approach Vol, veh/h	741			1143	43	
Approach Delay, s/veh	7.0			14.5	28.2	
Approach LOS	A			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	52.2				58.0		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	52.1				61.7		27.0
Max Q Clear Time (g_c+I1), s	2.6	13.5				37.8		3.6
Green Ext Time (p_c), s	0.0	18.0				14.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	7	0	39	186	16
Future Vol, veh/h	0	7	0	39	186	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	8	0	42	202	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	211	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	834	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	834	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	834	-	-
HCM Lane V/C Ratio	-	0.009	-	-
HCM Control Delay (s)	-	9.4	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	5	34	5	26	167
Future Vol, veh/h	1	5	34	5	26	167
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	5	37	5	28	182

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	278	40	0	0	42	0
Stage 1	40	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	716	1037	-	-	1580	-
Stage 1	988	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	702	1037	-	-	1580	-
Mov Cap-2 Maneuver	702	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	790	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	961	1580	-
HCM Lane V/C Ratio	-	-	0.007	0.018	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	1	3	36	150	18
Future Vol, veh/h	4	1	3	36	150	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	1	3	39	163	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	219	173	183	0	-	0
Stage 1	173	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	774	876	1404	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	772	876	1404	-	-	-
Mov Cap-2 Maneuver	762	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	980	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1404	-	782	-	-
HCM Lane V/C Ratio	0.002	-	0.007	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	2	37	5	8	143
Future Vol, veh/h	1	2	37	5	8	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	2	40	5	9	155

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	216	43	0	0	46	0
Stage 1	43	-	-	-	-	-
Stage 2	173	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	777	1033	-	-	1575	-
Stage 1	985	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	772	1033	-	-	1575	-
Mov Cap-2 Maneuver	760	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	923	1575	-
HCM Lane V/C Ratio	-	-	0.004	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	1	39	32	97	46
Future Vol, veh/h	11	1	39	32	97	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	1	42	35	105	50

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	250	130	155	0	-	0
Stage 1	130	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	743	925	1438	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	721	925	1438	-	-	-
Mov Cap-2 Maneuver	736	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	4.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1438	-	749	-	-
HCM Lane V/C Ratio	0.029	-	0.017	-	-
HCM Control Delay (s)	7.6	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	4	21	64	70	28
Future Vol, veh/h	7	4	21	64	70	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	4	23	70	76	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	206	91	107	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	787	972	1497	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	774	972	1497	-	-	-
Mov Cap-2 Maneuver	772	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	900	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1497	-	834	-	-
HCM Lane V/C Ratio	0.015	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	3	13	76	31	43
Future Vol, veh/h	8	3	13	76	31	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	3	14	83	34	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	168	57	80	0	-	0
Stage 1	57	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	827	1015	1531	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	819	1015	1531	-	-	-
Mov Cap-2 Maneuver	800	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1531	-	849	-	-
HCM Lane V/C Ratio	0.009	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	2	8	86	17	17
Future Vol, veh/h	3	2	8	86	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	2	9	93	18	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	139	28	37	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	859	1053	1587	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	854	1053	1587	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	913	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1587	-	898	-	-
HCM Lane V/C Ratio	0.005	-	0.006	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	79	68	710	16	3	16
Future Vol, veh/h	79	68	710	16	3	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	86	74	772	17	3	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	772	0	-	0	1018	772
Stage 1	-	-	-	-	772	-
Stage 2	-	-	-	-	246	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	852	-	-	-	265	403
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	800	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	852	-	-	-	238	403
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	SB
HCM Control Delay, s	5.2	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	852	-	-	-	409	403
HCM Lane V/C Ratio	0.101	-	-	-	0.008	0.043
HCM Control Delay (s)	9.7	-	-	-	13.9	14.3
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	3	400	93	34	1034	0	0
Future Volume (vph)	3	400	93	34	1034	0	0
Turn Type	Prot	NA	Perm	Prot	NA	NA	NA
Protected Phases	5	2		1	6	8	4
Permitted Phases			2				
Detector Phase	5	2	2	1	6	8	4
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	23.2	9.6	16.2	31.6	14.6
Total Split (s)	9.6	62.2	62.2	11.6	64.2	31.6	14.6
Total Split (%)	8.0%	51.8%	51.8%	9.7%	53.5%	26.3%	12.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	None	Min	Min
Act Effct Green (s)	5.0	74.0	74.0	6.6	79.3	13.4	10.0
Actuated g/C Ratio	0.04	0.62	0.62	0.06	0.66	0.11	0.08
v/c Ratio	0.04	0.20	0.10	0.40	0.92	0.09	0.01
Control Delay	56.7	12.0	3.3	67.0	32.7	0.6	51.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	12.0	3.3	67.0	32.7	0.6	51.0
LOS	E	B	A	E	C	A	D
Approach Delay		10.6			33.8	0.6	51.0
Approach LOS		B			C	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:EBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 26.1	Intersection LOS: C
Intersection Capacity Utilization 74.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	400	93	34	1034	0	18	0	7	1	0	0
Future Volume (veh/h)	3	400	93	34	1034	0	18	0	7	1	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1872	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	3	440	102	37	1136	0	20	0	8	1	0	0
Adj No. of Lanes	1	2	1	1	1	1	0	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	6	2294	975	48	1241	1014	99	0	39	143	0	0
Arrive On Green	0.00	0.64	0.64	0.03	0.66	0.00	0.08	0.00	0.08	0.08	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	1872	1530	1184	0	473	1714	0	0
Grp Volume(v), veh/h	3	440	102	37	1136	0	28	0	0	1	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1872	1530	1657	0	0	1714	0	0
Q Serve(g_s), s	0.2	6.1	3.1	2.7	62.5	0.0	1.9	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.2	6.1	3.1	2.7	62.5	0.0	1.9	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.71		0.29	1.00		0.00
Lane Grp Cap(c), veh/h	6	2294	975	48	1241	1014	138	0	0	143	0	0
V/C Ratio(X)	0.47	0.19	0.10	0.77	0.92	0.00	0.20	0.00	0.00	0.01	0.00	0.00
Avail Cap(c_a), veh/h	67	2294	975	94	1241	1014	373	0	0	143	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	59.6	9.0	8.5	57.8	17.4	0.0	51.3	0.0	0.0	50.5	0.0	0.0
Incr Delay (d2), s/veh	18.3	0.2	0.2	9.5	10.7	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.1	1.4	1.3	35.5	0.0	0.9	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	78.0	9.2	8.7	67.3	28.0	0.0	52.0	0.0	0.0	50.5	0.0	0.0
LnGrp LOS	E	A	A	E	C		D			D		
Approach Vol, veh/h		545			1173			28			1	
Approach Delay, s/veh		9.5			29.3			52.0			50.5	
Approach LOS		A			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	82.7		14.6	5.1	85.7		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	7.0	56.0		10.0	5.0	58.0		27.0
Max Q Clear Time (g_c+I1), s	4.7	8.1		2.1	2.2	64.5		3.9
Green Ext Time (p_c), s	0.0	3.1		0.0	0.0	0.0		0.1

Intersection Summary		
HCM 2010 Ctrl Delay		23.5
HCM 2010 LOS		C

Intersection	
Int Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	17	10	0	83	49
Future Vol, veh/h	0	17	10	0	83	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	18	11	0	90	53

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	245	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	234	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	748	1076	-	-	1621	-
Stage 1	1017	-	-	-	-	-
Stage 2	810	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	705	1076	-	-	1621	-
Mov Cap-2 Maneuver	705	-	-	-	-	-
Stage 1	1017	-	-	-	-	-
Stage 2	764	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1076	1621	-
HCM Lane V/C Ratio	-	-	0.017	0.056	-
HCM Control Delay (s)	-	-	8.4	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	398	21	11	1084	18	20
Future Vol, veh/h	398	21	11	1084	18	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	415	22	11	1129	19	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	436	0	1578	218
Stage 1	-	-	-	-	426	-
Stage 2	-	-	-	-	1152	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1134	-	111	792
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	304	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1134	-	110	792
Mov Cap-2 Maneuver	-	-	-	-	269	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	301	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	269	792	-	-	1134	-
HCM Lane V/C Ratio	0.07	0.026	-	-	0.01	-
HCM Control Delay (s)	19.4	9.7	-	-	8.2	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	360	23	942	152	18
Future Volume (vph)	360	23	942	152	18
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	31.8	5.0	35.4	10.1	10.1
Actuated g/C Ratio	0.56	0.09	0.62	0.18	0.18
v/c Ratio	0.24	0.17	0.92	0.58	0.07
Control Delay	7.0	28.7	25.3	33.1	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	28.7	25.3	33.1	11.2
LOS	A	C	C	C	B
Approach Delay	7.0		25.4	30.7	
Approach LOS	A		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 71.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	360	58	23	942	152	18
Future Volume (veh/h)	360	58	23	942	152	18
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	396	64	25	1035	167	17
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1526	245	46	1130	283	267
Arrive On Green	0.52	0.52	0.03	0.63	0.17	0.17
Sat Flow, veh/h	3033	472	1619	1800	1619	1530
Grp Volume(v), veh/h	229	231	25	1035	167	17
Grp Sat Flow(s),veh/h/ln	1710	1705	1619	1800	1619	1530
Q Serve(g_s), s	4.3	4.3	0.9	28.8	5.4	0.5
Cycle Q Clear(g_c), s	4.3	4.3	0.9	28.8	5.4	0.5
Prop In Lane		0.28	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	887	884	46	1130	283	267
V/C Ratio(X)	0.26	0.26	0.54	0.92	0.59	0.06
Avail Cap(c_a), veh/h	887	884	141	1217	283	267
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.7	7.7	27.4	9.3	21.7	19.7
Incr Delay (d2), s/veh	0.2	0.2	3.6	10.4	8.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.0	0.4	17.1	3.1	0.3
LnGrp Delay(d),s/veh	7.8	7.8	31.0	19.7	30.5	20.2
LnGrp LOS	A	A	C	B	C	C
Approach Vol, veh/h	460			1060	184	
Approach Delay, s/veh	7.8			20.0	29.5	
Approach LOS	A			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.2	35.9				42.1		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	2.9	6.3				30.8		7.4
Green Ext Time (p_c), s	0.0	10.8				5.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	279	61	753	212	65
Future Volume (vph)	279	61	753	212	65
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	23.6	5.4	29.0	13.6	13.6
Actuated g/C Ratio	0.44	0.10	0.54	0.25	0.25
v/c Ratio	0.32	0.43	0.87	0.58	0.18
Control Delay	11.3	34.3	21.7	27.1	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	34.3	21.7	27.1	16.6
LOS	B	C	C	C	B
Approach Delay	11.3		22.6	24.7	
Approach LOS	B		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.7	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 20.0	Intersection LOS: B
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	279	124	61	753	212	65
Future Volume (veh/h)	279	124	61	753	212	65
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	313	139	69	846	238	55
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	935	405	97	991	403	381
Arrive On Green	0.41	0.41	0.06	0.55	0.25	0.25
Sat Flow, veh/h	2394	998	1619	1800	1619	1530
Grp Volume(v), veh/h	230	222	69	846	238	55
Grp Sat Flow(s),veh/h/ln	1710	1592	1619	1800	1619	1530
Q Serve(g_s), s	5.0	5.2	2.3	21.5	7.0	1.5
Cycle Q Clear(g_c), s	5.0	5.2	2.3	21.5	7.0	1.5
Prop In Lane		0.63	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	694	646	97	991	403	381
V/C Ratio(X)	0.33	0.34	0.71	0.85	0.59	0.14
Avail Cap(c_a), veh/h	819	762	162	1196	403	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	11.1	24.9	10.3	17.8	15.8
Incr Delay (d2), s/veh	0.3	0.3	3.6	5.3	6.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.3	1.1	11.8	3.8	0.7
LnGrp Delay(d),s/veh	11.3	11.4	28.5	15.5	24.1	16.6
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	452			915	293	
Approach Delay, s/veh	11.3			16.5	22.7	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.8	28.1				35.9		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.3	7.2				23.5		9.0
Green Ext Time (p_c), s	0.0	7.8				6.2		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	83	252	8	5	740	113	14	19	17	38	12	60
Future Vol, veh/h	83	252	8	5	740	113	14	19	17	38	12	60
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	87	265	8	5	779	119	15	20	18	40	13	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	899	0	0	276	0	0	1333	1355	140	1168	1300	839
Stage 1	-	-	-	-	-	-	446	446	-	850	850	-
Stage 2	-	-	-	-	-	-	887	909	-	318	450	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	764	-	-	1299	-	-	123	151	889	161	163	369
Stage 1	-	-	-	-	-	-	567	577	-	358	380	-
Stage 2	-	-	-	-	-	-	341	357	-	673	575	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	764	-	-	1298	-	-	89	133	886	133	143	369
Mov Cap-2 Maneuver	-	-	-	-	-	-	152	212	-	238	260	-
Stage 1	-	-	-	-	-	-	501	510	-	317	378	-
Stage 2	-	-	-	-	-	-	272	355	-	561	509	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0	23.3	24.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	249	764	-	-	1298	-	-	299
HCM Lane V/C Ratio	0.211	0.114	-	-	0.004	-	-	0.387
HCM Control Delay (s)	23.3	10.3	-	-	7.8	-	-	24.5
HCM Lane LOS	C	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.8	0.4	-	-	0	-	-	1.8

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	293	15	24	801	57	21
Future Vol, veh/h	293	15	24	801	57	21
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	322	16	26	880	63	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	339	0	1264	170
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	933	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1231	-	176	851
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	386	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1231	-	172	850
Mov Cap-2 Maneuver	-	-	-	-	340	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	378	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	16.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	406	-	-	1231	-
HCM Lane V/C Ratio	0.211	-	-	0.021	-
HCM Control Delay (s)	16.2	-	-	8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	101.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	314	0	0	0	0	0	825	0	0
Future Vol, veh/h	0	0	0	314	0	0	0	0	0	825	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	338	0	0	0	0	0	887	0	0
Number of Lanes	0	0	0	1	0	0	0	0	0	1	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay	14	134.2
HCM LOS	B	F

Lane	NBLn1	EBLn1
Vol Left, %	100%	0%
Vol Thru, %	0%	0%
Vol Right, %	0%	100%
Sign Control	Stop	Stop
Traffic Vol by Lane	825	314
LT Vol	825	0
Through Vol	0	0
RT Vol	0	314
Lane Flow Rate	887	338
Geometry Grp	1	1
Degree of Util (X)	1.231	0.487
Departure Headway (Hd)	4.994	5.706
Convergence, Y/N	Yes	Yes
Cap	727	635
Service Time	3.059	3.706
HCM Lane V/C Ratio	1.22	0.532
HCM Control Delay	134.2	14
HCM Lane LOS	F	B
HCM 95th-tile Q	31.1	2.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

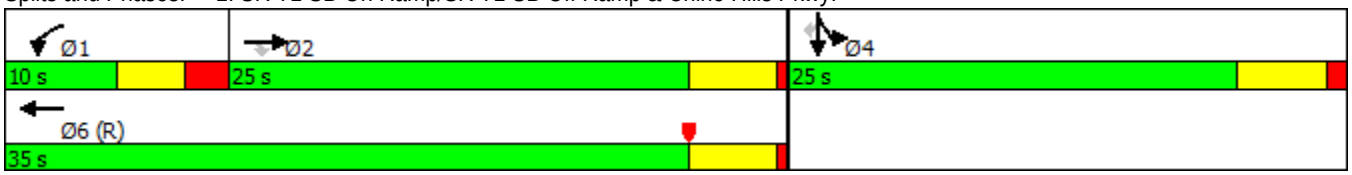
Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	0	0
Future Vol, veh/h	0	0	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	0	0
Number of Lanes	0	0	0	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1105	661	17	903	382	226	667
Future Volume (vph)	1105	661	17	903	382	226	667
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.40	0.71	0.13	0.55	0.61	0.58	1.19
Control Delay	11.4	9.5	37.7	9.4	23.0	21.5	123.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	9.5	37.7	9.4	23.0	21.5	123.8
LOS	B	A	D	A	C	C	F
Approach Delay	10.7			10.0		75.3	
Approach LOS	B			A		E	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 77.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1105	661	17	903	0	0	0	0	382	226	667
Future Volume (veh/h)	0	1105	661	17	903	0	0	0	0	382	226	667
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1163	570	18	951	0				320	353	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2498	608	35	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.04	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1163	570	18	951	0				320	353	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	8.3	21.8	0.7	0.0	0.0				9.9	9.8	0.0
Cycle Q Clear(g_c), s	0.0	8.3	21.8	0.7	0.0	0.0				9.9	9.8	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2498	608	35	1739	0				540	600	510
V/C Ratio(X)	0.00	0.47	0.94	0.51	0.55	0.00				0.59	0.59	0.00
Avail Cap(c_a), veh/h	0	2498	608	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.81	0.81	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.1	17.2	28.4	0.0	0.0				16.6	16.6	0.0
Incr Delay (d2), s/veh	0.0	0.1	22.3	3.5	1.0	0.0				4.7	4.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.5	12.6	0.3	0.2	0.0				5.1	5.5	0.0
LnGrp Delay(d),s/veh	0.0	13.3	39.4	31.9	1.0	0.0				21.4	20.8	0.0
LnGrp LOS		B	D	C	A					C	C	
Approach Vol, veh/h		1733			969						673	
Approach Delay, s/veh		21.9			1.6						21.1	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.3	28.7		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	23.8		11.9		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.5		20.6		

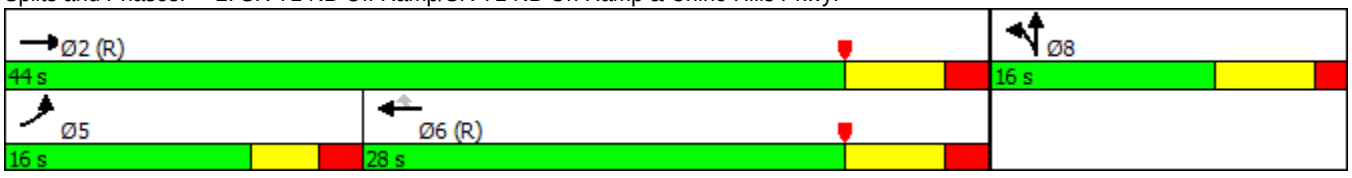
Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	395	1093	582	540	338	102
Future Volume (vph)	395	1093	582	540	338	102
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.8	37.5	21.7	21.7	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.80	0.55	0.51	0.83	0.74	0.56
Control Delay	36.4	9.1	16.8	22.6	44.9	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	9.1	16.8	22.6	44.9	27.5
LOS	D	A	B	C	D	C
Approach Delay		16.4	19.6			34.1
Approach LOS		B	B			C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 20.1	Intersection LOS: C
Intersection Capacity Utilization 77.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	395	1093	0	0	582	540	338	102	5	0	0	0
Future Volume (veh/h)	395	1093	0	0	582	540	338	102	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	425	1175	0	0	626	578	363	110	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	514	2138	0	0	1257	555	540	297	3			
Arrive On Green	0.17	0.63	0.00	0.00	0.37	0.37	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1781	16			
Grp Volume(v), veh/h	425	1175	0	0	626	578	363	0	111			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	8.3	11.8	0.0	0.0	8.5	22.1	6.3	0.0	3.3			
Cycle Q Clear(g_c), s	8.3	11.8	0.0	0.0	8.5	22.1	6.3	0.0	3.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	514	2138	0	0	1257	555	540	0	300			
V/C Ratio(X)	0.83	0.55	0.00	0.00	0.50	1.04	0.67	0.00	0.37			
Avail Cap(c_a), veh/h	542	2138	0	0	1257	555	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.61	0.61	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.9	6.4	0.0	0.0	14.7	19.0	23.5	0.0	22.2			
Incr Delay (d2), s/veh	8.9	0.9	0.0	0.0	0.9	41.3	6.6	0.0	3.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	5.7	0.0	0.0	4.1	15.5	3.3	0.0	1.9			
LnGrp Delay(d),s/veh	32.8	7.3	0.0	0.0	15.5	60.3	30.0	0.0	25.7			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1600			1204			474				
Approach Delay, s/veh		14.1			37.0			29.0				
Approach LOS		B			D			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			15.4	28.6		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		13.8			10.3	24.1		8.3
Green Ext Time (p_c), s		16.2			0.1	0.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

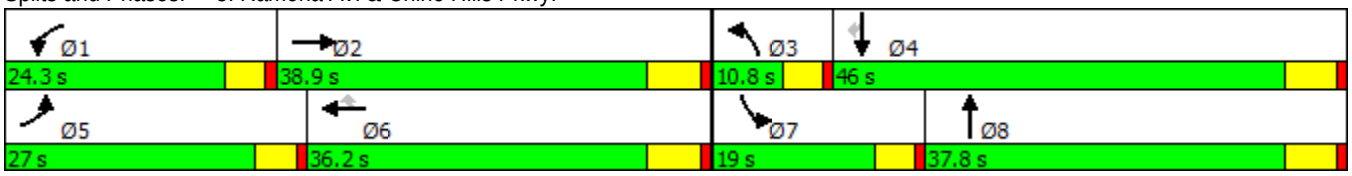
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	246	850	137	701	129	21	284	151	445	400
Future Volume (vph)	246	850	137	701	129	21	284	151	445	400
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	21.0	35.8	14.6	29.3	29.3	5.7	32.1	13.6	44.0	44.0
Actuated g/C Ratio	0.18	0.31	0.12	0.25	0.25	0.05	0.27	0.12	0.38	0.38
v/c Ratio	0.90	0.60	0.73	0.87	0.28	0.28	0.48	0.86	0.37	0.51
Control Delay	81.0	37.2	69.8	54.3	5.9	64.1	32.7	88.9	29.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	37.2	69.8	54.3	5.9	64.1	32.7	88.9	29.0	5.1
LOS	F	D	E	D	A	E	C	F	C	A
Approach Delay		47.0		50.0			34.2		28.5	
Approach LOS		D		D			C		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 116.9
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 41.0 — Intersection LOS: D
Intersection Capacity Utilization 89.0% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	850	2	137	701	129	21	284	134	151	445	400
Future Volume (veh/h)	246	850	2	137	701	129	21	284	134	151	445	400
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	262	904	2	146	746	92	22	302	88	161	473	316
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	287	1597	4	172	836	369	36	735	210	186	1278	563
Arrive On Green	0.18	0.32	0.32	0.11	0.24	0.24	0.02	0.28	0.28	0.11	0.37	0.37
Sat Flow, veh/h	1619	5063	11	1619	3420	1509	1619	2616	748	1619	3420	1507
Grp Volume(v), veh/h	262	585	321	146	746	92	22	195	195	161	473	316
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1654	1619	1710	1507
Q Serve(g_s), s	18.1	16.9	16.9	10.1	24.0	5.6	1.5	10.6	10.9	11.1	11.4	18.9
Cycle Q Clear(g_c), s	18.1	16.9	16.9	10.1	24.0	5.6	1.5	10.6	10.9	11.1	11.4	18.9
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	287	1034	567	172	836	369	36	481	465	186	1278	563
V/C Ratio(X)	0.91	0.57	0.57	0.85	0.89	0.25	0.62	0.41	0.42	0.87	0.37	0.56
Avail Cap(c_a), veh/h	318	1034	567	280	913	403	88	481	465	205	1278	563
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	32.5	32.5	50.0	41.6	34.6	55.2	33.2	33.4	49.5	25.9	28.2
Incr Delay (d2), s/veh	26.5	0.9	1.6	6.5	10.9	0.5	6.3	2.5	2.8	26.4	0.8	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	7.8	8.6	4.8	12.6	2.4	0.7	5.3	5.3	6.3	5.5	8.5
LnGrp Delay(d),s/veh	72.5	33.4	34.1	56.5	52.5	35.1	61.5	35.8	36.1	76.0	26.7	32.2
LnGrp LOS	E	C	C	E	D	D	E	D	D	E	C	C
Approach Vol, veh/h		1168			984			412			950	
Approach Delay, s/veh		42.4			51.5			37.3			36.9	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	41.7	7.1	48.4	24.8	33.6	17.7	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	12.1	18.9	3.5	20.9	20.1	26.0	13.1	12.9
Green Ext Time (p_c), s	0.1	10.5	0.0	6.1	0.1	1.8	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	42.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	838	120	45	803	87	27
Future Vol, veh/h	838	120	45	803	87	27
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	931	133	50	892	97	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	934	0	1480	469
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	546	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	741	-	119	546
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	550	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	741	-	111	544
Mov Cap-2 Maneuver	-	-	-	-	289	-
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	513	-

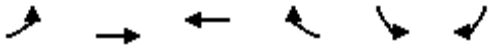
Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	23
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	325	-	-	741	-
HCM Lane V/C Ratio	0.39	-	-	0.067	-
HCM Control Delay (s)	23	-	-	10.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.8	-	-	0.2	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	119	746	615	58	232
Future Volume (vph)	119	746	615	58	232
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	10.6	39.2	23.9	23.5	35.4
Actuated g/C Ratio	0.14	0.53	0.32	0.32	0.48
v/c Ratio	0.56	0.45	0.67	0.07	0.32
Control Delay	40.8	11.4	25.0	21.3	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	11.4	25.0	21.3	6.0
LOS	D	B	C	C	A
Approach Delay		15.5	25.0	9.0	
Approach LOS		B	C	A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 74.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 57.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	746	615	60	58	232
Future Volume (veh/h)	119	746	615	60	58	232
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	129	811	668	63	63	66
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	160	1932	1288	121	858	595
Arrive On Green	0.10	0.56	0.41	0.41	0.29	0.29
Sat Flow, veh/h	1619	3510	3243	297	2956	1530
Grp Volume(v), veh/h	129	811	362	369	63	66
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1740	1478	1530
Q Serve(g_s), s	6.2	10.8	12.7	12.7	1.2	2.2
Cycle Q Clear(g_c), s	6.2	10.8	12.7	12.7	1.2	2.2
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	160	1932	699	711	858	595
V/C Ratio(X)	0.81	0.42	0.52	0.52	0.07	0.11
Avail Cap(c_a), veh/h	575	3644	1116	1136	858	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	9.9	17.7	17.8	20.6	15.6
Incr Delay (d2), s/veh	3.6	0.2	0.8	0.8	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	5.1	6.1	6.2	0.5	2.4
LnGrp Delay(d),s/veh	38.9	10.1	18.6	18.6	20.8	16.0
LnGrp LOS	D	B	B	B	C	B
Approach Vol, veh/h		940	731		129	
Approach Delay, s/veh		14.1	18.6		18.3	
Approach LOS		B	B		B	

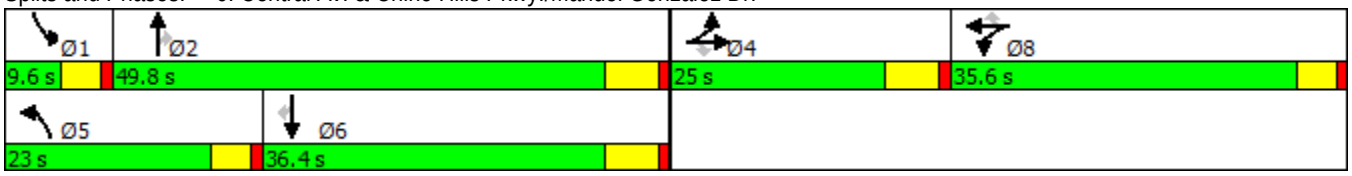
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		51.0		29.0	12.5	38.5		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		12.8		4.2	8.2	14.7		
Green Ext Time (p_c), s		22.3		0.3	0.1	17.9		

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	2	366	11	40	32	272	710	1	10	805	222
Future Volume (vph)	475	2	366	11	40	32	272	710	1	10	805	222
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.87	0.82	0.65	0.05	0.18	0.10	0.99	0.43	0.00	0.14	0.83	0.42
Control Delay	69.7	62.8	9.7	37.5	40.1	0.6	92.4	18.3	0.0	54.2	41.7	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	62.8	9.7	37.5	40.1	0.6	92.4	18.3	0.0	54.2	41.7	14.7
LOS	E	E	A	D	D	A	F	B	A	D	D	B
Approach Delay		41.6			24.4			38.8			36.1	
Approach LOS		D			C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 38.3	Intersection LOS: D
Intersection Capacity Utilization 75.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	475	2	366	11	40	32	272	710	1	10	805	222
Future Volume (veh/h)	475	2	366	11	40	32	272	710	1	10	805	222
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	517	0	270	12	43	18	296	772	1	11	875	171
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	629	0	297	153	170	143	304	1663	743	21	1067	471
Arrive On Green	0.19	0.00	0.19	0.09	0.09	0.09	0.19	0.49	0.49	0.01	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	517	0	270	12	43	18	296	772	1	11	875	171
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	15.0	0.0	16.9	0.7	2.2	1.1	17.8	14.7	0.0	0.7	23.2	8.6
Cycle Q Clear(g_c), s	15.0	0.0	16.9	0.7	2.2	1.1	17.8	14.7	0.0	0.7	23.2	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	629	0	297	153	170	143	304	1663	743	21	1067	471
V/C Ratio(X)	0.82	0.00	0.91	0.08	0.25	0.13	0.97	0.46	0.00	0.51	0.82	0.36
Avail Cap(c_a), veh/h	634	0	300	512	569	481	304	1663	743	83	1067	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.9	0.0	38.7	40.5	41.2	40.7	39.6	16.7	12.9	48.1	31.2	26.2
Incr Delay (d2), s/veh	8.5	0.0	29.7	0.2	0.8	0.4	44.4	0.9	0.0	6.9	7.1	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	9.6	0.3	1.1	0.5	11.7	7.1	0.0	0.3	12.0	3.8
LnGrp Delay(d),s/veh	46.4	0.0	68.4	40.8	42.0	41.1	84.0	17.6	12.9	55.0	38.3	28.3
LnGrp LOS	D		E	D	D	D	F	B	B	E	D	C
Approach Vol, veh/h		787			73			1069			1057	
Approach Delay, s/veh		54.0			41.6			36.0			36.8	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	53.5		24.8	23.0	36.4		13.8
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	16.7		18.9	19.8	25.2		4.2
Green Ext Time (p_c), s	0.0	17.9		0.1	0.0	4.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	41.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	5	573	4	400	9	550	682	509	682
Future Volume (vph)	25	5	573	4	400	9	550	682	509	682
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.1	10.1	24.6	24.6	68.3	5.1	23.9	23.9	37.9	64.7
Actuated g/C Ratio	0.09	0.09	0.22	0.22	0.62	0.05	0.22	0.22	0.34	0.58
v/c Ratio	0.18	0.16	0.88	0.84	0.40	0.12	0.78	0.87	0.96	0.25
Control Delay	53.8	26.5	69.1	62.9	6.2	59.2	50.8	19.3	68.3	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	26.5	69.1	62.9	6.2	59.2	50.8	19.3	68.3	13.5
LOS	D	C	E	E	A	E	D	B	E	B
Approach Delay		40.1		41.5			33.6			36.6
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 110.9	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 36.9	Intersection LOS: D
Intersection Capacity Utilization 97.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	5	20	573	4	400	9	550	682	509	682	17
Future Volume (veh/h)	25	5	20	573	4	400	9	550	682	509	682	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	5	12	600	0	266	9	573	534	530	710	14
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	106	31	74	686	0	830	18	714	315	535	2620	52
Arrive On Green	0.07	0.07	0.07	0.21	0.00	0.21	0.01	0.21	0.21	0.33	0.53	0.53
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4959	98
Grp Volume(v), veh/h	26	0	17	600	0	266	9	573	534	530	469	255
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.7	0.0	1.1	20.3	0.0	10.9	0.6	18.1	23.7	37.0	8.9	9.0
Cycle Q Clear(g_c), s	1.7	0.0	1.1	20.3	0.0	10.9	0.6	18.1	23.7	37.0	8.9	9.0
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	106	0	105	686	0	830	18	714	315	535	1731	941
V/C Ratio(X)	0.25	0.00	0.16	0.87	0.00	0.32	0.51	0.80	1.70	0.99	0.27	0.27
Avail Cap(c_a), veh/h	143	0	141	799	0	883	71	714	315	535	1731	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	0.0	50.1	43.2	0.0	14.4	55.8	42.7	44.9	37.8	14.7	14.7
Incr Delay (d2), s/veh	0.4	0.0	0.3	9.5	0.0	0.2	8.2	9.3	326.4	36.3	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	10.0	0.0	4.6	0.3	9.4	38.4	21.9	4.1	4.6
LnGrp Delay(d),s/veh	50.8	0.0	50.4	52.8	0.0	14.6	64.1	51.9	371.3	74.1	15.1	15.4
LnGrp LOS	D		D	D		B	E	D	F	E	B	B
Approach Vol, veh/h		43			866			1116			1254	
Approach Delay, s/veh		50.6			41.0			204.8			40.1	
Approach LOS		D			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.0	5.8	65.8		29.9
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.0	25.7		3.7	2.6	11.0		22.3
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	21.9		1.7

Intersection Summary		
HCM 2010 Ctrl Delay	96.6	
HCM 2010 LOS	F	

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1130	841	152
Future Volume (vph)	1130	841	152
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	87.6	87.6	22.9
Actuated g/C Ratio	0.73	0.73	0.19
v/c Ratio	0.45	0.25	1.02dr
Control Delay	4.6	6.0	50.7
Queue Delay	0.0	0.0	0.0
Total Delay	4.6	6.0	50.7
LOS	A	A	D
Approach Delay	4.6	6.0	50.7
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1130	367	0	841	152	328
Future Volume (veh/h)	1130	367	0	841	152	328
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1189	386	0	885	160	184
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2874	932	0	3844	224	212
Arrive On Green	1.00	1.00	0.00	0.78	0.14	0.14
Sat Flow, veh/h	3836	1192	0	5238	1619	1530
Grp Volume(v), veh/h	1060	515	0	885	160	184
Grp Sat Flow(s),veh/h/ln	1638	1590	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	5.7	11.3	14.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	5.7	11.3	14.1
Prop In Lane		0.75	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2563	1244	0	3844	224	212
V/C Ratio(X)	0.41	0.41	0.00	0.23	0.71	0.87
Avail Cap(c_a), veh/h	2563	1244	0	3844	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.5	49.4	50.6
Incr Delay (d2), s/veh	0.5	1.0	0.0	0.1	1.6	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.0	2.6	5.2	6.2
LnGrp Delay(d),s/veh	0.5	1.0	0.0	3.6	51.0	54.8
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1575			885	344	
Approach Delay, s/veh	0.7			3.6	53.0	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		98.4				98.4		21.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				7.7		16.1
Green Ext Time (p_c), s		17.8				17.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	679	85	657	818	0
Future Volume (vph)	679	85	657	818	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	32.9	32.9	32.9	79.1	79.1
Actuated g/C Ratio	0.27	0.27	0.27	0.66	0.66
v/c Ratio	0.51	0.18	0.74	0.74	0.86
Control Delay	39.0	8.3	39.5	18.5	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	8.3	39.5	18.5	25.6
LOS	D	A	D	B	C
Approach Delay	35.6		39.5		22.2
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 30.5	Intersection LOS: C
Intersection Capacity Utilization 76.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	679	85	0	657	335	0	0	0	818	0	751
Future Volume (veh/h)	0	679	85	0	657	335	0	0	0	818	0	751
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	686	0	0	664	338				729	135	633
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2040	635	0	1360	635				839	143	671
Arrive On Green	0.00	0.42	0.00	0.00	0.14	0.14				0.52	0.52	0.52
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	276	1295
Grp Volume(v), veh/h	0	686	0	0	664	338				729	0	768
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1571
Q Serve(g_s), s	0.0	11.4	0.0	0.0	22.5	24.7				47.4	0.0	55.3
Cycle Q Clear(g_c), s	0.0	11.4	0.0	0.0	22.5	24.7				47.4	0.0	55.3
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.82
Lane Grp Cap(c), veh/h	0	2040	635	0	1360	635				839	0	814
V/C Ratio(X)	0.00	0.34	0.00	0.00	0.49	0.53				0.87	0.00	0.94
Avail Cap(c_a), veh/h	0	2040	635	0	1360	635				1100	0	1067
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	23.9	0.0	0.0	40.0	40.9				25.3	0.0	27.2
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	1.3	3.2				5.0	0.0	12.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.2	0.0	0.0	10.5	11.0				22.2	0.0	26.6
LnGrp Delay(d),s/veh	0.0	24.3	0.0	0.0	41.2	44.1				30.3	0.0	39.3
LnGrp LOS		C			D	D				C		D
Approach Vol, veh/h		686			1002						1497	
Approach Delay, s/veh		24.3			42.2						34.9	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		54.3		65.7		54.3		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		13.4		57.3		26.7		
Green Ext Time (p_c), s		8.4		4.9		2.8		

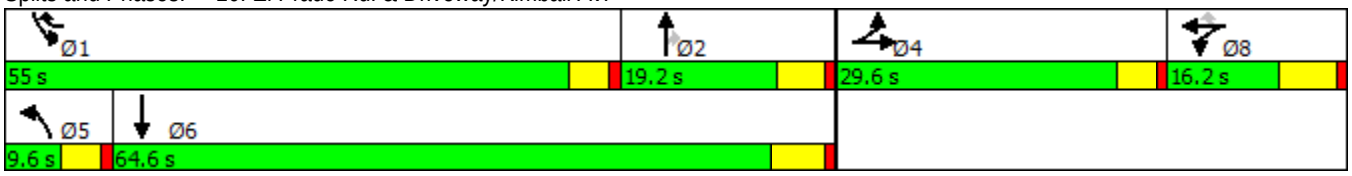
Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	34	8	3	636	4	192	23	800	336
Future Volume (vph)	34	8	3	636	4	192	23	800	336
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.17	0.07	0.14	0.56	0.05	0.74	0.07	0.95	0.17
Control Delay	42.6	29.8	48.4	3.6	53.2	60.2	0.3	47.3	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	29.8	48.4	3.6	53.2	60.2	0.3	47.3	10.7
LOS	D	C	D	A	D	E	A	D	B
Approach Delay		38.7	5.3			53.8			36.2
Approach LOS		D	A			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 81.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	8	8	22	3	636	4	192	23	800	336	13
Future Volume (veh/h)	34	8	8	22	3	636	4	192	23	800	336	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	36	8	6	23	3	218	4	202	23	842	354	13
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	71	53	148	19	900	79	236	200	795	1929	71
Arrive On Green	0.07	0.07	0.07	0.10	0.10	0.10	0.05	0.13	0.13	0.49	0.57	0.57
Sat Flow, veh/h	1619	956	717	1525	199	1530	1619	1800	1530	1619	3365	123
Grp Volume(v), veh/h	36	0	14	26	0	218	4	202	23	842	179	188
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1724	0	1530	1619	1800	1530	1619	1710	1778
Q Serve(g_s), s	2.2	0.0	0.8	1.4	0.0	7.0	0.2	11.3	1.4	50.4	5.1	5.2
Cycle Q Clear(g_c), s	2.2	0.0	0.8	1.4	0.0	7.0	0.2	11.3	1.4	50.4	5.1	5.2
Prop In Lane	1.00		0.43	0.88		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	124	168	0	900	79	236	200	795	980	1019
V/C Ratio(X)	0.30	0.00	0.11	0.15	0.00	0.24	0.05	0.86	0.11	1.06	0.18	0.18
Avail Cap(c_a), veh/h	394	0	408	168	0	900	79	246	209	795	980	1019
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	44.4	42.5	0.0	10.1	46.6	43.6	39.3	26.1	10.4	10.4
Incr Delay (d2), s/veh	1.4	0.0	0.4	0.4	0.0	0.1	0.1	24.0	0.3	48.7	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.4	0.7	0.0	3.0	0.1	7.2	0.6	33.1	2.4	2.5
LnGrp Delay(d),s/veh	46.4	0.0	44.8	42.9	0.0	10.3	46.7	67.6	39.6	74.8	10.5	10.5
LnGrp LOS	D		D	D		B	D	E	D	F	B	B
Approach Vol, veh/h		50			244			229			1209	
Approach Delay, s/veh		45.9			13.8			64.4			55.3	
Approach LOS		D			B			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.2		12.2	9.6	64.6		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	13.3		4.2	2.2	7.2		9.0
Green Ext Time (p_c), s	0.0	0.2		0.1	0.0	3.3		0.1

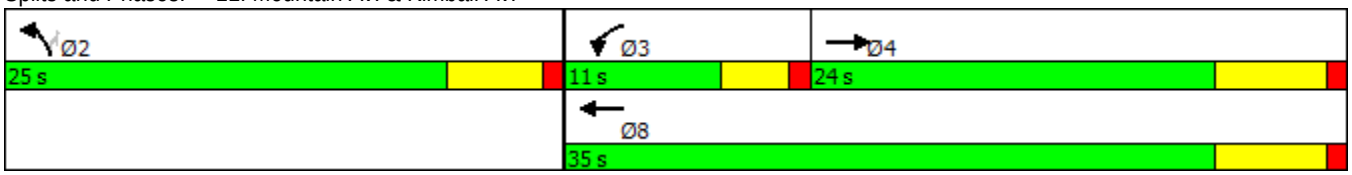
Intersection Summary	
HCM 2010 Ctrl Delay	50.4
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	854	14	565	94	62
Future Volume (vph)	854	14	565	94	62
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	17.7	7.3	19.2	8.8	8.8
Actuated g/C Ratio	0.44	0.18	0.48	0.22	0.22
v/c Ratio	0.67	0.05	0.38	0.29	0.17
Control Delay	14.7	18.2	7.6	15.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	18.2	7.6	15.9	5.8
LOS	B	B	A	B	A
Approach Delay	14.7		7.8	11.9	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 39.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 42.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	854	67	14	565	94	62
Future Volume (veh/h)	854	67	14	565	94	62
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	938	72	15	621	103	45
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1228	94	44	1760	301	284
Arrive On Green	0.38	0.38	0.03	0.51	0.19	0.19
Sat Flow, veh/h	3309	247	1619	3510	1619	1530
Grp Volume(v), veh/h	498	512	15	621	103	45
Grp Sat Flow(s),veh/h/ln	1710	1756	1619	1710	1619	1530
Q Serve(g_s), s	9.6	9.6	0.3	4.1	2.1	0.9
Cycle Q Clear(g_c), s	9.6	9.6	0.3	4.1	2.1	0.9
Prop In Lane		0.14	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	652	670	44	1760	301	284
V/C Ratio(X)	0.76	0.76	0.34	0.35	0.34	0.16
Avail Cap(c_a), veh/h	817	839	301	2631	846	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	10.2	18.0	5.4	13.3	12.9
Incr Delay (d2), s/veh	2.5	2.4	1.7	0.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	5.0	0.2	1.9	0.9	0.4
LnGrp Delay(d),s/veh	12.6	12.6	19.7	5.5	13.6	13.0
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	1010			636	148	
Approach Delay, s/veh	12.6			5.8	13.4	
Approach LOS	B			A	B	

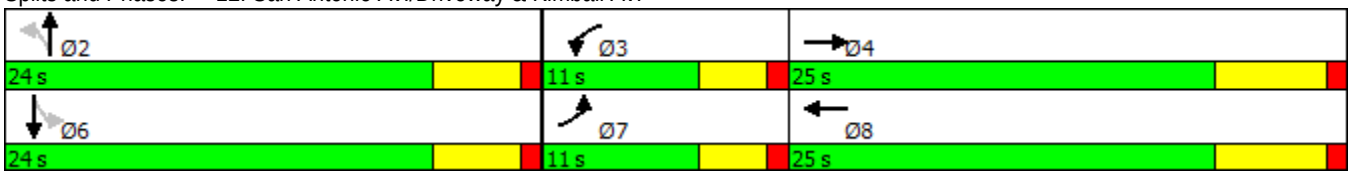
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	5.0	20.4				25.4
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		4.1	2.3	11.6				6.1
Green Ext Time (p_c), s		0.1	0.0	2.8				4.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	919	14	529	49	0		
Future Volume (vph)	919	14	529	49	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	25.0	11.0	25.0	24.0	24.0	24.0	11.0
Total Split (%)	41.7%	18.3%	41.7%	40.0%	40.0%	40%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	15.4	7.5	16.8	8.9	8.9		
Actuated g/C Ratio	0.41	0.20	0.45	0.24	0.24		
v/c Ratio	0.70	0.05	0.36	0.17	0.03		
Control Delay	14.8	17.8	7.5	14.3	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	14.8	17.8	7.5	14.3	0.1		
LOS	B	B	A	B	A		
Approach Delay	14.8		7.8		10.7		
Approach LOS	B		A		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 37.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 42.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	919	19	14	529	0	49	0	17	0	0	0
Future Volume (veh/h)	0	919	19	14	529	0	49	0	17	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	967	20	15	557	0	52	0	16	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	4	1299	27	44	1760	0	503	0	290	195	342	0
Arrive On Green	0.00	0.38	0.38	0.03	0.51	0.00	0.19	0.00	0.19	0.00	0.00	0.00
Sat Flow, veh/h	1619	3427	71	1619	3510	0	1619	0	1530	1340	1800	0
Grp Volume(v), veh/h	0	483	504	15	557	0	52	0	16	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1787	1619	1710	0	1619	0	1530	1340	1800	0
Q Serve(g_s), s	0.0	9.0	9.0	0.3	3.5	0.0	1.0	0.0	0.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.0	9.0	0.3	3.5	0.0	1.0	0.0	0.3	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	648	678	44	1760	0	503	0	290	195	342	0
V/C Ratio(X)	0.00	0.74	0.74	0.34	0.32	0.00	0.10	0.00	0.06	0.00	0.00	0.00
Avail Cap(c_a), veh/h	307	881	921	307	1762	0	1034	0	792	635	932	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.9	9.9	17.6	5.2	0.0	12.5	0.0	12.2	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.4	4.6	0.2	1.6	0.0	0.4	0.0	0.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	11.2	11.2	19.3	5.2	0.0	12.5	0.0	12.3	0.0	0.0	0.0
LnGrp LOS		B	B	B	A		B		B			
Approach Vol, veh/h		987			572			68			0	
Approach Delay, s/veh		11.2			5.6			12.5			0.0	
Approach LOS		B			A			B				

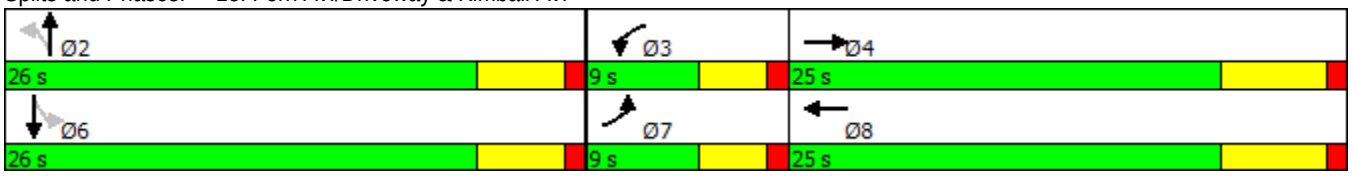
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.0	20.0		11.9	0.0	25.0
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		3.0	2.3	11.0		0.0	0.0	5.5
Green Ext Time (p_c), s		0.0	0.0	3.0		0.0	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	924	11	471	45	1	100	7
Future Volume (vph)	4	924	11	471	45	1	100	7
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.3	18.3	5.3	18.3	8.7	8.7	8.7	8.7
Actuated g/C Ratio	0.13	0.46	0.13	0.46	0.22	0.22	0.22	0.22
v/c Ratio	0.02	0.68	0.06	0.34	0.18	0.12	0.42	0.09
Control Delay	20.5	14.4	20.7	9.3	14.6	6.2	18.6	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	14.4	20.7	9.3	14.6	6.2	18.6	7.7
LOS	C	B	C	A	B	A	B	A
Approach Delay		14.4		9.6		10.7		16.0
Approach LOS		B		A		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 39.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	924	21	11	471	0	45	1	37	100	7	24
Future Volume (veh/h)	4	924	21	11	471	0	45	1	37	100	7	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	1050	18	12	535	0	51	1	22	114	8	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	11	1404	24	25	1427	0	405	10	231	398	121	137
Arrive On Green	0.01	0.41	0.41	0.02	0.42	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1619	3439	59	1619	3510	0	1339	67	1473	1332	775	872
Grp Volume(v), veh/h	5	522	546	12	535	0	51	0	23	114	0	17
Grp Sat Flow(s),veh/h/ln	1619	1710	1788	1619	1710	0	1339	0	1540	1332	0	1646
Q Serve(g_s), s	0.1	9.1	9.1	0.3	3.8	0.0	1.2	0.0	0.4	2.8	0.0	0.3
Cycle Q Clear(g_c), s	0.1	9.1	9.1	0.3	3.8	0.0	1.5	0.0	0.4	3.2	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.00	1.00		0.96	1.00		0.53
Lane Grp Cap(c), veh/h	11	698	730	25	1427	0	405	0	241	398	0	258
V/C Ratio(X)	0.46	0.75	0.75	0.47	0.37	0.00	0.13	0.00	0.10	0.29	0.00	0.07
Avail Cap(c_a), veh/h	232	948	991	232	1895	0	1006	0	933	997	0	997
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	8.8	8.8	17.0	7.0	0.0	13.1	0.0	12.6	14.0	0.0	12.5
Incr Delay (d2), s/veh	10.5	1.3	1.3	4.9	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.5	4.7	0.1	1.7	0.0	0.4	0.0	0.2	1.0	0.0	0.1
LnGrp Delay(d),s/veh	27.8	10.1	10.0	21.9	7.1	0.0	13.2	0.0	12.6	14.1	0.0	12.6
LnGrp LOS	C	B	B	C	A		B		B	B		B
Approach Vol, veh/h		1073			547			74			131	
Approach Delay, s/veh		10.1			7.4			13.0			13.9	
Approach LOS		B			A			B			B	

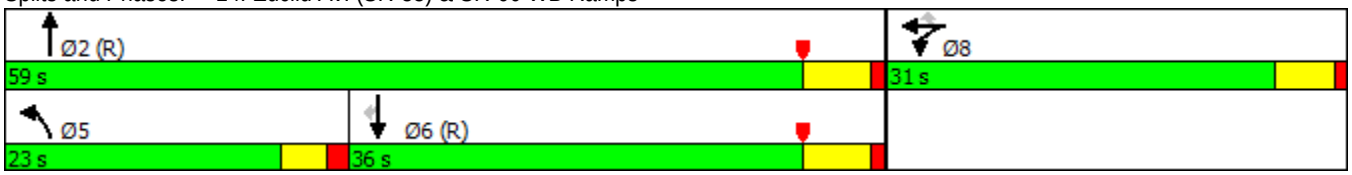
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.4	4.5	19.9		10.4	4.2	20.2
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		3.5	2.3	11.1		5.2	2.1	5.8
Green Ext Time (p_c), s		0.2	0.0	3.2		0.2	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.7
HCM 2010 LOS	A

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	539	6	398	268	984	858	518
Future Volume (vph)	539	6	398	268	984	858	518
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.4	23.4	23.4	17.6	56.1	33.9	33.9
Actuated g/C Ratio	0.26	0.26	0.26	0.20	0.62	0.38	0.38
v/c Ratio	0.87	0.82	0.69	0.89	0.49	0.70	0.61
Control Delay	53.7	45.3	27.7	52.7	20.0	28.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	53.7	45.3	27.7	52.7	21.4	28.4	5.4
LOS	D	D	C	D	C	C	A
Approach Delay		42.7			28.1	19.8	
Approach LOS		D			C	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 28.7	Intersection LOS: C
Intersection Capacity Utilization 92.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	539	6	398	268	984	0	0	858	518
Future Volume (veh/h)	0	0	0	539	6	398	268	984	0	0	858	518
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				652	0	178	282	1036	0	0	903	545
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				740	0	345	306	2239	0	0	1421	616
Arrive On Green				0.23	0.00	0.23	0.38	1.00	0.00	0.00	0.42	0.42
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1483
Grp Volume(v), veh/h				652	0	178	282	1036	0	0	903	545
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1483
Q Serve(g_s), s				17.5	0.0	9.3	15.0	0.0	0.0	0.0	18.9	30.6
Cycle Q Clear(g_c), s				17.5	0.0	9.3	15.0	0.0	0.0	0.0	18.9	30.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				740	0	345	306	2239	0	0	1421	616
V/C Ratio(X)				0.88	0.00	0.52	0.92	0.46	0.00	0.00	0.64	0.88
Avail Cap(c_a), veh/h				935	0	436	333	2239	0	0	1421	616
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.58	0.58	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.5	0.0	30.4	27.3	0.0	0.0	0.0	20.9	24.3
Incr Delay (d2), s/veh				7.0	0.0	0.4	18.6	0.4	0.0	0.0	2.2	16.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.5	0.0	3.9	8.2	0.1	0.0	0.0	9.3	15.3
LnGrp Delay(d),s/veh				40.6	0.0	30.8	46.0	0.4	0.0	0.0	23.1	41.2
LnGrp LOS				D		C	D	A			C	D
Approach Vol, veh/h					830			1318			1448	
Approach Delay, s/veh					38.5			10.1			29.9	
Approach LOS					D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		64.4			21.5	42.9		25.6
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			17.0	32.6		19.5
Green Ext Time (p_c), s		37.6			0.1	0.0		1.1

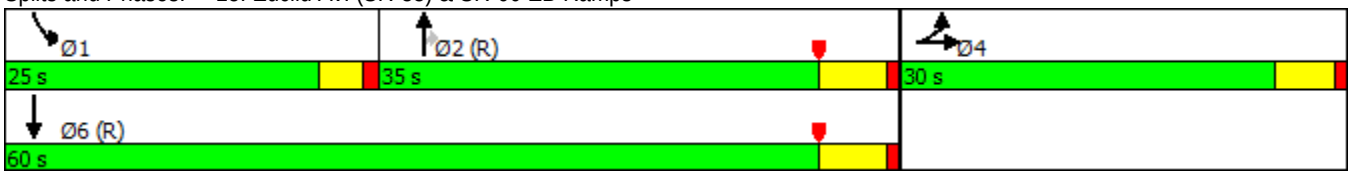
Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	370	2	882	609	295	1101
Future Volume (vph)	370	2	882	609	295	1101
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.6	22.6	33.7	33.7	19.2	56.9
Actuated g/C Ratio	0.25	0.25	0.37	0.37	0.21	0.63
v/c Ratio	0.88	0.87	0.70	0.66	0.88	0.52
Control Delay	57.0	45.0	28.9	6.0	52.2	4.1
Queue Delay	2.9	2.2	0.0	0.0	0.0	0.4
Total Delay	59.9	47.2	28.9	6.0	52.2	4.5
LOS	E	D	C	A	D	A
Approach Delay		53.2	19.5			14.6
Approach LOS		D	B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 24.2	Intersection LOS: C
Intersection Capacity Utilization 92.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	2	332	0	0	0	0	882	609	295	1101	0
Future Volume (veh/h)	370	2	332	0	0	0	0	882	609	295	1101	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	321	81	262				0	900	621	301	1123	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	390	90	292				0	1349	586	330	2198	0
Arrive On Green	0.24	0.24	0.24				0.00	0.39	0.39	0.27	0.85	0.00
Sat Flow, veh/h	1619	375	1212				0	3510	1486	1619	3510	0
Grp Volume(v), veh/h	321	0	343				0	900	621	301	1123	0
Grp Sat Flow(s),veh/h/ln	1619	0	1586				0	1710	1486	1619	1710	0
Q Serve(g_s), s	16.9	0.0	18.9				0.0	19.5	35.5	16.2	7.6	0.0
Cycle Q Clear(g_c), s	16.9	0.0	18.9				0.0	19.5	35.5	16.2	7.6	0.0
Prop In Lane	1.00		0.76				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	390	0	382				0	1349	586	330	2198	0
V/C Ratio(X)	0.82	0.00	0.90				0.00	0.67	1.06	0.91	0.51	0.00
Avail Cap(c_a), veh/h	450	0	441				0	1349	586	378	2198	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.83	0.83	0.58	0.58	0.00
Uniform Delay (d), s/veh	32.4	0.0	33.1				0.0	22.4	27.3	32.0	2.9	0.0
Incr Delay (d2), s/veh	9.1	0.0	17.8				0.0	2.2	50.9	15.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	0.0	10.1				0.0	9.5	22.8	8.6	3.6	0.0
LnGrp Delay(d),s/veh	41.5	0.0	50.9				0.0	24.6	78.1	47.1	3.4	0.0
LnGrp LOS	D		D					C	F	D	A	
Approach Vol, veh/h		664						1521			1424	
Approach Delay, s/veh		46.3						46.5			12.6	
Approach LOS		D						D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.3	41.0		26.7		63.3		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	18.2	37.5		20.9		9.6		
Green Ext Time (p_c), s	0.1	0.0		0.8		35.9		

Intersection Summary	
HCM 2010 Ctrl Delay	33.1
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	119	308	90	268	123	1175	61	312	981	132
Future Volume (vph)	119	308	90	268	123	1175	61	312	981	132
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	45.0	45.0	45.0	45.0	19.0	48.0	48.0	27.0	56.0	56.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	15.8%	40.0%	40.0%	22.5%	46.7%	46.7%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.0	26.0	27.0	27.0	13.8	60.4	60.4	17.5	64.5	64.5
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.12	0.50	0.50	0.15	0.54	0.54
v/c Ratio	0.90	0.61	0.72	0.52	0.69	0.49	0.08	0.76	0.39	0.16
Control Delay	97.3	39.3	69.5	35.4	78.3	9.7	0.3	60.6	18.4	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.3	39.3	69.5	35.4	78.3	9.7	0.3	60.6	18.4	3.7
LOS	F	D	E	D	E	A	A	E	B	A
Approach Delay		51.8		41.9		15.5			26.3	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 74.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	308	127	90	268	117	123	1175	61	312	981	132
Future Volume (veh/h)	119	308	127	90	268	117	123	1175	61	312	981	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	124	321	101	94	279	101	128	1224	41	325	1022	79
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	226	690	213	210	665	235	151	2305	708	377	2457	763
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.12	0.62	0.62	0.13	0.50	0.50
Sat Flow, veh/h	958	2564	792	925	2471	873	1619	4914	1509	2956	4914	1526
Grp Volume(v), veh/h	124	212	210	94	191	189	128	1224	41	325	1022	79
Grp Sat Flow(s),veh/h/ln	958	1710	1645	925	1710	1634	1619	1638	1509	1478	1638	1526
Q Serve(g_s), s	14.7	12.4	12.8	11.4	11.0	11.5	9.3	16.8	1.3	12.9	15.8	3.3
Cycle Q Clear(g_c), s	26.2	12.4	12.8	24.2	11.0	11.5	9.3	16.8	1.3	12.9	15.8	3.3
Prop In Lane	1.00		0.48	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	460	443	210	460	440	151	2305	708	377	2457	763
V/C Ratio(X)	0.55	0.46	0.47	0.45	0.42	0.43	0.85	0.53	0.06	0.86	0.42	0.10
Avail Cap(c_a), veh/h	277	551	531	267	566	541	190	2305	708	554	2457	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.45	0.45	0.45	0.84	0.84	0.84
Uniform Delay (d), s/veh	47.1	36.6	36.7	46.9	36.1	36.2	51.7	15.1	12.2	51.3	18.9	15.8
Incr Delay (d2), s/veh	2.1	0.7	0.8	1.5	0.6	0.7	12.3	0.4	0.1	5.5	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	6.0	5.9	3.0	5.3	5.3	4.7	7.6	0.5	5.6	7.2	1.4
LnGrp Delay(d),s/veh	49.1	37.3	37.5	48.4	36.7	36.9	64.0	15.5	12.3	56.8	19.4	16.0
LnGrp LOS	D	D	D	D	D	D	E	B	B	E	B	B
Approach Vol, veh/h		546			474			1393			1426	
Approach Delay, s/veh		40.1			39.1			19.9			27.7	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.8	61.6		38.6	16.1	65.3		38.6
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	22.5	42.7		38.7	14.1	* 52		* 40
Max Q Clear Time (g_c+I1), s	14.9	18.8		28.2	11.3	17.8		26.2
Green Ext Time (p_c), s	0.4	14.9		4.1	0.1	18.1		4.7

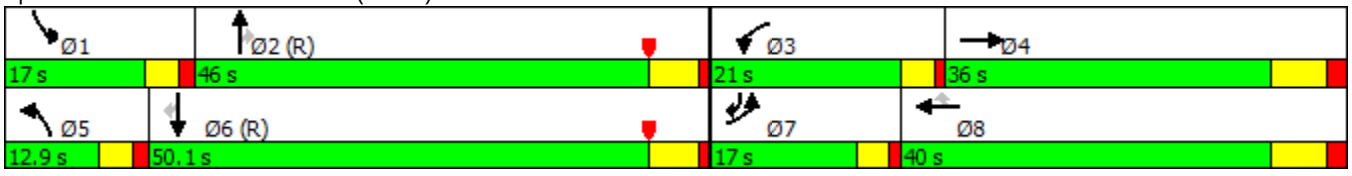
Intersection Summary			
HCM 2010 Ctrl Delay		28.0	
HCM 2010 LOS		C	

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	144	369	166	331	53	72	1056	264	125	822	159
Future Volume (vph)	144	369	166	331	53	72	1056	264	125	822	159
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.8	22.8	15.6	25.6	25.6	9.8	46.7	46.7	13.9	53.1	67.4
Actuated g/C Ratio	0.11	0.19	0.13	0.21	0.21	0.08	0.39	0.39	0.12	0.44	0.56
v/c Ratio	0.91	0.71	0.85	0.49	0.14	0.59	0.85	0.38	0.72	0.58	0.19
Control Delay	101.0	50.0	84.3	42.8	1.9	62.0	43.7	17.6	62.3	35.1	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.0	50.0	84.3	42.8	1.9	62.0	43.7	17.6	62.3	35.1	12.2
LOS	F	D	F	D	A	E	D	B	E	D	B
Approach Delay		62.8		51.3			39.7			34.8	
Approach LOS		E		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 43.6	Intersection LOS: D
Intersection Capacity Utilization 79.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	369	61	166	331	53	72	1056	264	125	822	159
Future Volume (veh/h)	144	369	61	166	331	53	72	1056	264	125	822	159
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	155	397	32	178	356	57	77	1135	153	134	884	73
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	566	45	202	659	290	96	1456	652	159	1589	866
Arrive On Green	0.11	0.18	0.18	0.12	0.19	0.19	0.02	0.14	0.14	0.03	0.15	0.15
Sat Flow, veh/h	1619	3207	257	1619	3420	1506	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	155	211	218	178	356	57	77	1135	153	134	884	73
Grp Sat Flow(s),veh/h/ln	1619	1710	1755	1619	1710	1506	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	11.3	13.9	14.0	13.0	11.3	3.8	5.7	38.4	10.7	9.9	28.7	4.0
Cycle Q Clear(g_c), s	11.3	13.9	14.0	13.0	11.3	3.8	5.7	38.4	10.7	9.9	28.7	4.0
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	302	309	202	659	290	96	1456	652	159	1589	866
V/C Ratio(X)	0.88	0.70	0.70	0.88	0.54	0.20	0.80	0.78	0.23	0.84	0.56	0.08
Avail Cap(c_a), veh/h	175	413	424	229	941	414	113	1456	652	169	1589	866
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.78	0.78	0.78	0.91	0.91	0.91
Uniform Delay (d), s/veh	52.8	46.4	46.5	51.6	43.6	40.6	58.1	46.1	34.2	57.1	39.3	18.6
Incr Delay (d2), s/veh	36.2	4.3	4.4	26.0	1.0	0.5	23.5	3.3	0.7	27.4	1.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	6.9	7.2	7.2	5.4	1.6	3.2	18.9	4.6	5.7	13.9	1.7
LnGrp Delay(d),s/veh	89.0	50.8	50.9	77.7	44.6	41.1	81.6	49.4	34.9	84.6	40.6	18.8
LnGrp LOS	F	D	D	E	D	D	F	D	C	F	D	B
Approach Vol, veh/h		584			591			1365			1091	
Approach Delay, s/veh		61.0			54.2			49.6			44.6	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	56.6	19.0	28.2	11.6	61.3	17.0	30.1
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	11.9	40.4	15.0	16.0	7.7	30.7	13.3	13.3
Green Ext Time (p_c), s	0.0	0.1	0.0	5.1	0.0	10.3	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	50.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	67	166	33	69	93	50	1344	203	15	928	60
Future Volume (vph)	67	166	33	69	93	50	1344	203	15	928	60
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	9.0	70.8	70.8	9.2	71.0	71.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	7.5%	59.0%	59.0%	7.7%	59.2%	59.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.2	22.2	22.2		22.2	7.5	81.0	81.0	5.5	75.5	75.5
Actuated g/C Ratio	0.18	0.18	0.18		0.18	0.06	0.68	0.68	0.05	0.63	0.63
v/c Ratio	0.40	0.51	0.10		0.83	0.52	0.60	0.20	0.20	0.44	0.06
Control Delay	47.7	48.0	3.5		72.5	77.7	10.9	3.8	75.5	5.8	0.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	48.0	3.5		72.5	77.7	10.9	3.8	75.5	5.8	0.4
LOS	D	D	A		E	E	B	A	E	A	A
Approach Delay		42.4			72.5		12.1			6.5	
Approach LOS		D			E		B			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 83.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	166	33	69	93	23	50	1344	203	15	928	60
Future Volume (veh/h)	67	166	33	69	93	23	50	1344	203	15	928	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	69	171	15	71	96	20	52	1386	153	15	957	33
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	216	365	310	109	134	24	64	2201	985	27	2121	929
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.08	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1224	1800	1530	334	663	119	1619	3420	1530	1619	3420	1498
Grp Volume(v), veh/h	69	171	15	187	0	0	52	1386	153	15	957	33
Grp Sat Flow(s),veh/h/ln	1224	1800	1530	1116	0	0	1619	1710	1530	1619	1710	1498
Q Serve(g_s), s	0.0	10.0	0.9	10.7	0.0	0.0	3.8	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.6	10.0	0.9	20.7	0.0	0.0	3.8	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	216	365	310	268	0	0	64	2201	985	27	2121	929
V/C Ratio(X)	0.32	0.47	0.05	0.70	0.00	0.00	0.81	0.63	0.16	0.57	0.45	0.04
Avail Cap(c_a), veh/h	304	495	421	376	0	0	74	2201	985	77	2121	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.52	0.52	0.52	0.74	0.74	0.74
Uniform Delay (d), s/veh	42.4	42.2	38.5	47.8	0.0	0.0	54.8	0.0	0.0	57.6	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.9	0.1	3.3	0.0	0.0	21.8	0.7	0.2	5.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.1	0.4	6.3	0.0	0.0	2.1	0.2	0.0	0.5	0.2	0.0
LnGrp Delay(d),s/veh	43.2	43.1	38.6	51.1	0.0	0.0	76.6	0.7	0.2	62.7	0.5	0.1
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		255			187			1591			1005	
Approach Delay, s/veh		42.9			51.1			3.1			1.4	
Approach LOS		D			D			A			A	

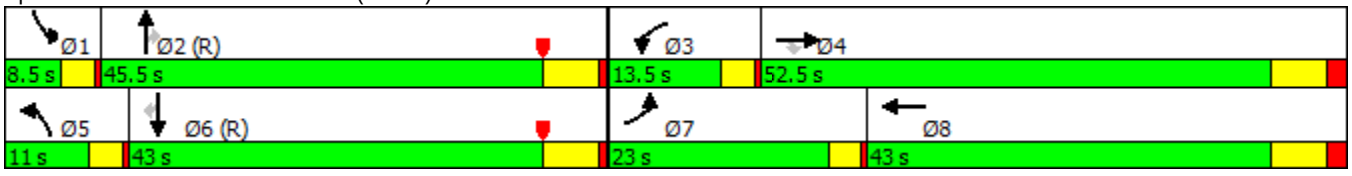
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	83.2		31.3	8.3	80.4		31.3
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	64.8		33.0	5.5	65.0		33.0
Max Q Clear Time (g_c+I1), s	3.1	2.0		12.6	5.8	2.0		22.7
Green Ext Time (p_c), s	0.0	30.5		2.1	0.0	30.5		1.6

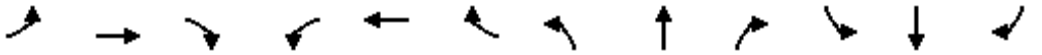
Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	288	217	156	25	47	90	1310	38	22	904	127
Future Volume (vph)	288	217	156	25	47	90	1310	38	22	904	127
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	26.9	26.9	10.0	14.4	11.3	66.3	66.3	5.7	57.3	57.3
Actuated g/C Ratio	0.16	0.22	0.22	0.08	0.12	0.09	0.55	0.55	0.05	0.48	0.48
v/c Ratio	1.13	0.56	0.34	0.19	0.28	0.62	0.72	0.04	0.30	0.57	0.17
Control Delay	142.0	45.5	6.5	55.0	38.5	53.7	27.2	1.7	66.5	26.7	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.0	45.5	6.5	55.0	38.5	53.7	27.2	1.7	66.5	26.7	7.7
LOS	F	D	A	E	D	D	C	A	E	C	A
Approach Delay		78.3			43.4		28.2			25.3	
Approach LOS		E			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 37.9	Intersection LOS: D
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	288	217	156	25	47	14	90	1310	38	22	904	127
Future Volume (veh/h)	288	217	156	25	47	14	90	1310	38	22	904	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	297	224	85	26	48	9	93	1351	30	23	932	78
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	313	266	78	88	16	101	2014	901	36	1877	821
Arrive On Green	0.16	0.17	0.17	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1475	277	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	297	224	85	26	0	57	93	1351	30	23	932	78
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1751	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	14.1	5.8	1.9	0.0	3.8	6.9	43.9	1.9	1.7	29.4	5.2
Cycle Q Clear(g_c), s	19.5	14.1	5.8	1.9	0.0	3.8	6.9	43.9	1.9	1.7	29.4	5.2
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	313	266	78	0	104	101	2014	901	36	1877	821
V/C Ratio(X)	1.13	0.72	0.32	0.33	0.00	0.55	0.92	0.67	0.03	0.64	0.50	0.10
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	2014	901	67	1877	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.60	0.60	0.60	0.90	0.90	0.90
Uniform Delay (d), s/veh	50.3	46.8	43.4	55.2	0.0	54.9	58.5	37.6	20.6	59.1	34.2	24.3
Incr Delay (d2), s/veh	94.7	2.3	0.5	0.9	0.0	3.3	45.8	1.1	0.0	6.1	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	7.2	2.5	0.9	0.0	1.9	4.4	21.2	0.8	0.8	14.2	2.2
LnGrp Delay(d),s/veh	144.9	49.1	43.9	56.1	0.0	58.1	104.2	38.6	20.7	65.2	35.1	24.5
LnGrp LOS	F	D	D	E		E	F	D	C	E	D	C
Approach Vol, veh/h		606			83			1474			1033	
Approach Delay, s/veh		95.3			57.5			42.4			34.9	
Approach LOS		F			E			D			C	

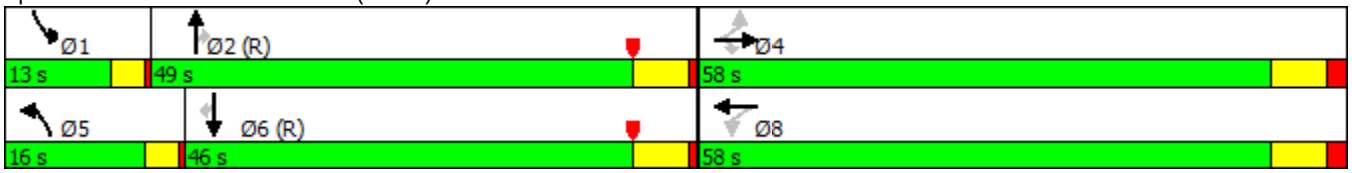
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	76.7	9.3	27.8	11.0	71.9	23.0	14.1
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.7	45.9	3.9	16.1	8.9	31.4	21.5	5.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	4.9	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	50.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	330	452	202	26	132	105	1045	73	66	850	163
Future Volume (vph)	330	452	202	26	132	105	1045	73	66	850	163
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7	11.3	54.1	54.1	8.5	49.6	49.6
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.09	0.45	0.45	0.07	0.41	0.41
v/c Ratio	0.87	0.72	0.31	0.17	0.26	0.71	0.69	0.10	0.59	0.61	0.23
Control Delay	58.2	39.5	4.1	26.0	24.8	56.2	43.4	18.9	87.9	18.3	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	39.5	4.1	26.0	24.8	56.2	43.4	18.9	87.9	18.3	4.5
LOS	E	D	A	C	C	E	D	B	F	B	A
Approach Delay		38.5			25.0		43.1			20.5	
Approach LOS		D			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 33.8	Intersection LOS: C
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	452	202	26	132	29	105	1045	73	66	850	163
Future Volume (veh/h)	330	452	202	26	132	29	105	1045	73	66	850	163
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	337	461	114	27	135	25	107	1066	54	67	867	139
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	436	687	576	196	565	105	130	1469	657	83	1369	612
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.03	0.14	0.14	0.10	0.80	0.80
Sat Flow, veh/h	1176	1800	1508	804	1478	274	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	337	461	114	27	0	160	107	1066	54	67	867	139
Grp Sat Flow(s),veh/h/ln	1176	1800	1508	804	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	32.8	25.5	6.1	3.5	0.0	7.5	7.9	35.8	3.7	4.9	12.3	2.7
Cycle Q Clear(g_c), s	40.2	25.5	6.1	29.0	0.0	7.5	7.9	35.8	3.7	4.9	12.3	2.7
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	436	687	576	196	0	669	130	1469	657	83	1369	612
V/C Ratio(X)	0.77	0.67	0.20	0.14	0.00	0.24	0.82	0.73	0.08	0.81	0.63	0.23
Avail Cap(c_a), veh/h	487	765	641	231	0	744	169	1469	657	128	1369	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.89	0.89	0.89	0.83	0.83	0.83
Uniform Delay (d), s/veh	38.9	30.8	24.8	42.9	0.0	25.2	57.6	44.7	31.0	53.3	8.4	7.4
Incr Delay (d2), s/veh	6.8	2.0	0.2	0.3	0.0	0.2	15.7	2.8	0.2	8.5	1.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	13.1	2.5	0.8	0.0	3.6	4.1	17.6	1.6	2.4	5.9	1.2
LnGrp Delay(d),s/veh	45.7	32.8	25.0	43.2	0.0	25.4	73.3	47.6	31.2	61.8	10.3	8.2
LnGrp LOS	D	C	C	D		C	E	D	C	E	B	A
Approach Vol, veh/h		912			187			1227			1073	
Approach Delay, s/veh		36.6			28.0			49.1			13.2	
Approach LOS		D			C			D			B	

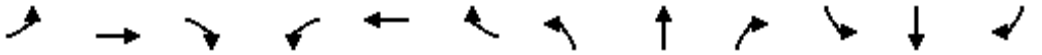
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	57.5		52.8	13.1	54.0		52.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	6.9	37.8		42.2	9.9	14.3		31.0
Green Ext Time (p_c), s	0.0	4.3		3.6	0.0	14.8		5.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	47	27	151	6	12	84	1110	11	10	1049	49
Future Volume (vph)	47	27	151	6	12	84	1110	11	10	1049	49
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.3	15.3	15.3	15.3	15.3	10.9	92.5	92.5	5.5	79.8	79.8
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.09	0.77	0.77	0.05	0.66	0.66
v/c Ratio	0.32	0.13	0.49	0.04	0.11	0.62	0.46	0.01	0.15	0.50	0.05
Control Delay	47.8	41.4	10.2	37.3	25.8	74.2	2.9	0.0	67.6	6.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	41.4	10.2	37.3	25.8	74.2	2.9	0.0	67.6	6.1	0.1
LOS	D	D	B	D	C	E	A	A	E	A	A
Approach Delay		21.7			28.4		7.8			6.4	
Approach LOS		C			C		A			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	27	151	6	12	10	84	1110	11	10	1049	49
Future Volume (veh/h)	47	27	151	6	12	10	84	1110	11	10	1049	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	51	29	59	7	13	9	91	1207	11	11	1140	53
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	137	126	107	129	69	48	112	2738	1225	21	2546	1114
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.80	0.80	0.03	1.00	1.00
Sat Flow, veh/h	1333	1800	1530	1256	992	687	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	51	29	59	7	0	22	91	1207	11	11	1140	53
Grp Sat Flow(s),veh/h/ln	1333	1800	1530	1256	0	1679	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.5	1.8	4.5	0.6	0.0	1.5	6.7	13.1	0.2	0.8	0.0	0.0
Cycle Q Clear(g_c), s	6.0	1.8	4.5	2.5	0.0	1.5	6.7	13.1	0.2	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	137	126	107	129	0	117	112	2738	1225	21	2546	1114
V/C Ratio(X)	0.37	0.23	0.55	0.05	0.00	0.19	0.81	0.44	0.01	0.53	0.45	0.05
Avail Cap(c_a), veh/h	510	630	535	480	0	588	175	2738	1225	67	2546	1114
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	55.4	52.7	54.0	53.9	0.0	52.6	55.1	3.7	2.4	58.1	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.7	3.3	0.1	0.0	0.6	11.9	0.5	0.0	12.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.9	2.0	0.2	0.0	0.7	3.4	6.2	0.1	0.4	0.2	0.0
LnGrp Delay(d),s/veh	56.7	53.4	57.2	54.0	0.0	53.2	67.0	4.2	2.4	70.4	0.5	0.1
LnGrp LOS	E	D	E	D		D	E	A	A	E	A	A
Approach Vol, veh/h		139			29			1309			1204	
Approach Delay, s/veh		56.2			53.4			8.6			1.1	
Approach LOS		E			D			A			A	

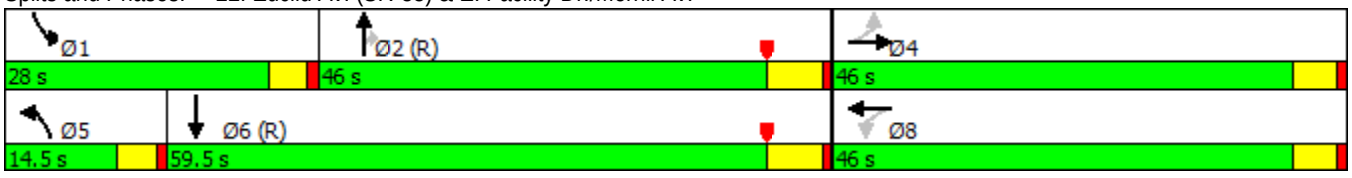
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	101.8		13.2	11.8	95.0		13.2
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.8	15.1		8.0	8.7	2.0		4.5
Green Ext Time (p_c), s	0.0	24.5		0.4	0.0	25.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	20	98	0	2	1132	180	254	927
Future Volume (vph)	5	20	98	0	2	1132	180	254	927
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		20.9		20.9	10.0	59.8	59.8	23.9	85.2
Actuated g/C Ratio		0.17		0.17	0.08	0.50	0.50	0.20	0.71
v/c Ratio		0.13		0.65	0.01	0.71	0.24	0.85	0.41
Control Delay		28.9		30.0	67.0	16.1	4.1	49.3	11.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.9		30.0	67.0	16.1	4.1	49.3	11.9
LOS		C		C	E	B	A	D	B
Approach Delay		28.9		30.0		14.5			19.9
Approach LOS		C		C		B			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	20	11	98	0	101	2	1132	180	254	927	1
Future Volume (veh/h)	5	20	11	98	0	101	2	1132	180	254	927	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	22	4	105	0	81	2	1217	165	273	997	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	56	196	32	163	5	93	9	1859	814	296	2528	3
Arrive On Green	0.14	0.14	0.14	0.14	0.00	0.14	0.01	0.54	0.54	0.18	0.72	0.72
Sat Flow, veh/h	144	1356	222	806	33	647	1619	3420	1497	1619	3506	4
Grp Volume(v), veh/h	31	0	0	186	0	0	2	1217	165	273	486	512
Grp Sat Flow(s),veh/h/ln	1722	0	0	1486	0	0	1619	1710	1497	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	12.8	0.0	0.0	0.1	30.3	6.8	19.9	13.3	13.3
Cycle Q Clear(g_c), s	1.8	0.0	0.0	14.6	0.0	0.0	0.1	30.3	6.8	19.9	13.3	13.3
Prop In Lane	0.16		0.13	0.56		0.44	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	283	0	0	261	0	0	9	1859	814	296	1233	1298
V/C Ratio(X)	0.11	0.00	0.00	0.71	0.00	0.00	0.23	0.65	0.20	0.92	0.39	0.39
Avail Cap(c_a), veh/h	613	0	0	549	0	0	135	1859	814	317	1233	1298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.49	0.49	0.49	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	50.1	0.0	0.0	59.4	19.4	14.0	48.2	6.5	6.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.4	0.0	0.0	2.4	0.9	0.3	29.1	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	6.1	0.0	0.0	0.1	14.4	2.9	11.3	6.5	6.9
LnGrp Delay(d),s/veh	44.8	0.0	0.0	51.4	0.0	0.0	61.9	20.3	14.3	77.3	7.5	7.4
LnGrp LOS	D			D			E	C	B	E	A	A
Approach Vol, veh/h		31			186			1384			1271	
Approach Delay, s/veh		44.8			51.4			19.6			22.4	
Approach LOS		D			D			B			C	

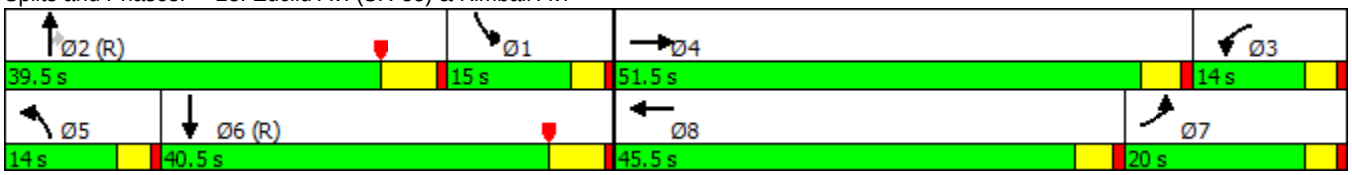
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.5	71.2		22.3	5.1	92.5		22.3
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	21.9	32.3		3.8	2.1	15.3		16.6
Green Ext Time (p_c), s	0.1	6.4		0.7	0.0	20.7		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	23.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	307	789	46	325	66	685	30	307	674
Future Volume (vph)	307	789	46	325	66	685	30	307	674
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	32.5	44.2	15.6	24.5	10.0	30.0	30.0	14.5	37.3
Actuated g/C Ratio	0.27	0.37	0.13	0.20	0.08	0.25	0.25	0.12	0.31
v/c Ratio	0.73	0.70	0.23	0.78	0.51	0.84	0.06	1.64	0.75
Control Delay	52.4	36.5	50.4	36.9	49.0	51.2	1.5	345.4	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	36.5	50.4	36.9	49.0	51.2	1.5	345.4	43.0
LOS	D	D	D	D	D	D	A	F	D
Approach Delay		40.8		37.9		49.1			130.4
Approach LOS		D		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.64	
Intersection Signal Delay: 68.2	Intersection LOS: E
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	789	48	46	325	283	66	685	30	307	674	82
Future Volume (veh/h)	307	789	48	46	325	283	66	685	30	307	674	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	320	822	46	48	339	261	69	714	16	320	702	67
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	232	958	54	105	395	298	121	829	371	374	1309	125
Arrive On Green	0.14	0.29	0.29	0.06	0.21	0.21	0.02	0.08	0.08	0.23	0.42	0.42
Sat Flow, veh/h	1619	3293	184	1619	1858	1404	1619	3420	1530	1619	3152	301
Grp Volume(v), veh/h	320	427	441	48	311	289	69	714	16	320	381	388
Grp Sat Flow(s),veh/h/ln	1619	1710	1767	1619	1710	1552	1619	1710	1530	1619	1710	1742
Q Serve(g_s), s	17.2	28.3	28.3	3.4	21.0	21.6	5.1	24.8	1.2	22.7	20.1	20.1
Cycle Q Clear(g_c), s	17.2	28.3	28.3	3.4	21.0	21.6	5.1	24.8	1.2	22.7	20.1	20.1
Prop In Lane	1.00		0.10	1.00		0.90	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	232	497	514	105	363	330	121	829	371	374	710	724
V/C Ratio(X)	1.38	0.86	0.86	0.46	0.86	0.88	0.57	0.86	0.04	0.85	0.54	0.54
Avail Cap(c_a), veh/h	232	670	692	135	584	530	135	955	427	374	710	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	0.82	0.82	0.82	0.92	0.92	0.92
Uniform Delay (d), s/veh	51.4	40.2	40.2	54.1	45.5	45.7	56.6	53.2	42.4	44.2	26.4	26.4
Incr Delay (d2), s/veh	189.9	6.1	5.9	1.2	4.0	5.6	1.6	9.6	0.2	15.3	2.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.9	14.2	14.7	1.6	10.3	9.7	2.3	12.9	0.5	11.7	10.0	10.2
LnGrp Delay(d),s/veh	241.3	46.3	46.2	55.3	49.5	51.3	58.2	62.8	42.5	59.5	29.0	29.0
LnGrp LOS	F	D	D	E	D	D	E	E	D	E	C	C
Approach Vol, veh/h		1188			648			799			1089	
Approach Delay, s/veh		98.8			50.7			62.0			38.0	
Approach LOS		F			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.8	35.1	11.8	39.4	13.0	55.8	21.2	30.0
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	24.7	26.8	5.4	30.3	7.1	22.1	19.2	23.6
Green Ext Time (p_c), s	0.0	2.3	0.0	4.6	0.0	3.6	0.0	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	64.8
HCM 2010 LOS	E

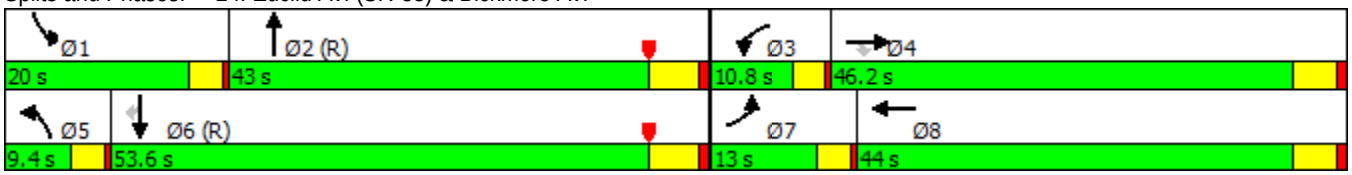
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	66	86	45	105	25	15	651	126	552	54
Future Volume (vph)	66	86	45	105	25	15	651	126	552	54
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.0	16.0	16.0	15.6	24.4	5.6	57.1	13.8	70.5	70.5
Actuated g/C Ratio	0.08	0.13	0.13	0.13	0.20	0.05	0.48	0.12	0.59	0.59
v/c Ratio	0.60	0.40	0.16	0.56	0.27	0.23	0.54	0.75	0.31	0.07
Control Delay	74.2	49.2	1.2	61.0	14.5	87.3	9.0	83.8	3.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	49.2	1.2	61.0	14.5	87.3	9.0	83.8	3.7	0.1
LOS	E	D	A	E	B	F	A	F	A	A
Approach Delay		46.6			39.0		10.5		17.3	
Approach LOS		D			D		B		B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 19.8 — Intersection LOS: B
Intersection Capacity Utilization 56.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	86	45	105	25	69	15	651	118	126	552	54
Future Volume (veh/h)	66	86	45	105	25	69	15	651	118	126	552	54
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	73	96	31	117	28	65	17	723	121	140	613	60
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	91	134	114	98	38	89	29	1809	303	162	2397	1050
Arrive On Green	0.06	0.07	0.07	0.06	0.08	0.08	0.02	0.82	0.82	0.20	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	482	1120	1619	2923	489	1619	3420	1499
Grp Volume(v), veh/h	73	96	31	117	0	93	17	423	421	140	613	60
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1602	1619	1710	1702	1619	1710	1499
Q Serve(g_s), s	5.3	6.3	2.3	7.3	0.0	6.8	1.2	7.8	7.8	10.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	6.3	2.3	7.3	0.0	6.8	1.2	7.8	7.8	10.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.70	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	91	134	114	98	0	127	29	1058	1053	162	2397	1050
V/C Ratio(X)	0.81	0.72	0.27	1.19	0.00	0.73	0.58	0.40	0.40	0.87	0.26	0.06
Avail Cap(c_a), veh/h	128	618	525	98	0	521	80	1058	1053	223	2397	1050
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.26	0.26	0.26	0.63	0.63	0.63
Uniform Delay (d), s/veh	56.0	54.3	52.5	56.3	0.0	54.0	58.1	4.7	4.7	47.2	0.0	0.0
Incr Delay (d2), s/veh	14.7	2.7	0.5	149.8	0.0	3.0	1.8	0.3	0.3	11.9	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.2	1.0	7.4	0.0	3.1	0.6	3.7	3.7	5.0	0.1	0.0
LnGrp Delay(d),s/veh	70.7	56.9	52.9	206.1	0.0	57.0	59.9	5.0	5.0	59.1	0.2	0.1
LnGrp LOS	E	E	D	F		E	E	A	A	E	A	A
Approach Vol, veh/h		200			210			861			813	
Approach Delay, s/veh		61.3			140.1			6.1			10.3	
Approach LOS		E			F			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	79.8	10.8	13.9	5.7	89.6	10.2	14.5
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	12.0	9.8	9.3	8.3	3.2	2.0	7.3	8.8
Green Ext Time (p_c), s	0.1	5.7	0.0	0.7	0.0	5.9	0.0	0.7

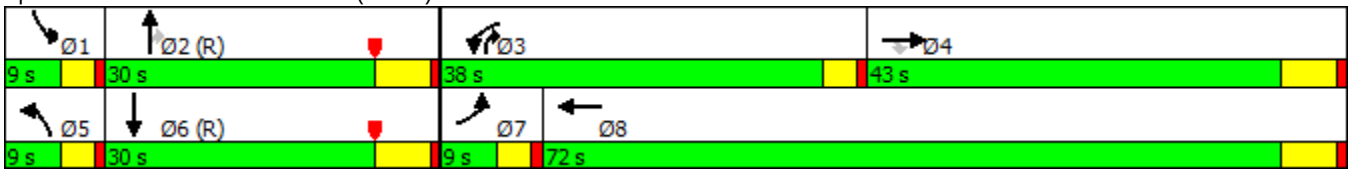
Intersection Summary	
HCM 2010 Ctrl Delay	26.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	14	323	28	445	71	33	686	1022	78	576
Future Volume (vph)	14	323	28	445	71	33	686	1022	78	576
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	28.4	28.4	34.0	62.8	6.2	26.4	66.4	11.1	35.1
Actuated g/C Ratio	0.04	0.24	0.24	0.28	0.52	0.05	0.22	0.55	0.09	0.29
v/c Ratio	0.21	0.78	0.06	0.55	0.12	0.40	0.94	1.10	0.53	0.61
Control Delay	63.1	55.4	0.2	39.5	10.0	69.3	44.3	67.6	52.0	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	55.4	0.2	39.5	10.0	69.3	44.3	67.6	52.0	33.5
LOS	E	E	A	D	B	E	D	E	D	C
Approach Delay		51.4			33.9		58.5			35.6
Approach LOS		D			C		E			D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 49.0 — Intersection LOS: D
Intersection Capacity Utilization 101.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	323	28	445	71	34	33	686	1022	78	576	14
Future Volume (veh/h)	14	323	28	445	71	34	33	686	1022	78	576	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	14	333	0	459	73	29	34	707	621	80	594	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	25	390	332	516	461	183	46	1369	879	67	1423	24
Arrive On Green	0.02	0.22	0.00	0.17	0.38	0.38	0.03	0.40	0.40	0.01	0.14	0.14
Sat Flow, veh/h	1619	1800	1530	2956	1227	487	1619	3420	1530	1619	3440	58
Grp Volume(v), veh/h	14	333	0	459	0	102	34	707	621	80	295	309
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1714	1619	1710	1530	1619	1710	1788
Q Serve(g_s), s	1.0	21.3	0.0	18.2	0.0	4.7	2.5	18.8	34.9	5.0	19.0	19.0
Cycle Q Clear(g_c), s	1.0	21.3	0.0	18.2	0.0	4.7	2.5	18.8	34.9	5.0	19.0	19.0
Prop In Lane	1.00		1.00	1.00		0.28	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	25	390	332	516	0	644	46	1369	879	67	707	740
V/C Ratio(X)	0.56	0.85	0.00	0.89	0.00	0.16	0.74	0.52	0.71	1.19	0.42	0.42
Avail Cap(c_a), veh/h	67	555	472	838	0	943	67	1369	879	67	707	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.95	0.95	0.95
Uniform Delay (d), s/veh	58.7	45.1	0.0	48.4	0.0	24.9	57.9	27.2	18.3	59.2	38.6	38.6
Incr Delay (d2), s/veh	7.0	10.3	0.0	4.4	0.0	0.2	0.9	0.1	0.4	165.5	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.8	0.0	7.8	0.0	2.3	1.1	8.9	14.8	5.3	9.3	9.8
LnGrp Delay(d),s/veh	65.6	55.5	0.0	52.8	0.0	25.0	58.8	27.3	18.7	224.7	40.3	40.2
LnGrp LOS	E	E		D		C	E	C	B	F	D	D
Approach Vol, veh/h		347			561			1362			684	
Approach Delay, s/veh		55.9			47.7			24.2			61.8	
Approach LOS		E			D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	54.0	24.9	32.0	7.4	55.6	5.9	51.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	36.9	20.2	23.3	4.5	21.0	3.0	6.7
Green Ext Time (p_c), s	0.0	0.0	0.7	2.7	0.0	1.9	0.0	3.9

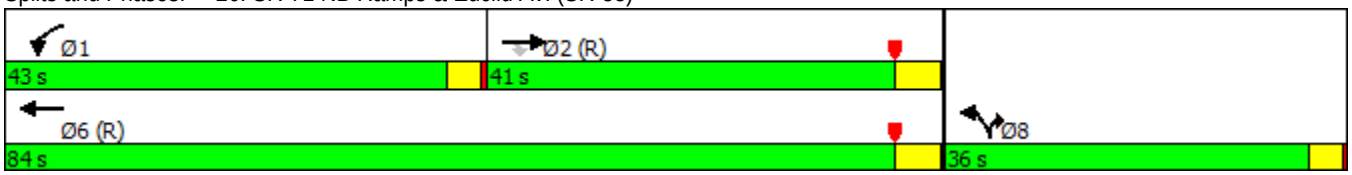
Intersection Summary	
HCM 2010 Ctrl Delay	41.1
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	742	171	289	807	147	1086
Future Volume (vph)	742	171	289	807	147	1086
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	41.0	41.0	43.0	84.0	36.0	36.0
Total Split (%)	34.2%	34.2%	35.8%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	48.8	48.8	27.2	79.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.23	0.66	0.27	0.27
v/c Ratio	0.59	0.26	0.83	0.40	0.18	1.44
Control Delay	33.5	9.2	65.5	2.6	34.2	224.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	9.2	65.5	2.6	34.2	224.9
LOS	C	A	E	A	C	F
Approach Delay	28.9			19.2	202.2	
Approach LOS	C			B	F	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.44
Intersection Signal Delay: 91.5 — Intersection LOS: F
Intersection Capacity Utilization 99.7% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	742	171	289	807	147	1086
Future Volume (veh/h)	742	171	289	807	147	1086
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	824	0	321	897	163	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2162	967	349	2957	229	105
Arrive On Green	1.00	0.00	0.20	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	824	0	321	897	163	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	22.0	5.8	5.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	22.0	5.8	5.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2162	967	349	2957	229	105
V/C Ratio(X)	0.38	0.00	0.92	0.30	0.71	0.00
Avail Cap(c_a), veh/h	2162	967	564	2957	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.80	0.80	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	46.8	1.5	54.7	0.0
Incr Delay (d2), s/veh	0.5	0.0	8.1	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	11.2	2.7	2.8	0.0
LnGrp Delay(d),s/veh	0.5	0.0	54.9	1.7	58.8	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	824			1218	163	
Approach Delay, s/veh	0.5			15.7	58.8	
Approach LOS	A			B	E	

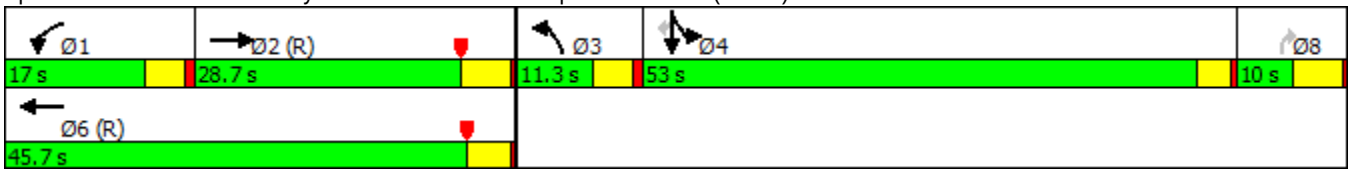
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	27.9	80.3				108.3		11.7
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	39.5	36.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	24.0	2.0				7.8		7.8
Green Ext Time (p_c), s	0.4	11.8				13.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	269	97	200	29	15	696	138	150
Future Volume (vph)	269	97	200	29	15	696	138	150
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.7	17.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.9%	14.2%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	38.2	11.7	54.9	6.5	5.0	40.4	40.4	40.4
Actuated g/C Ratio	0.32	0.10	0.46	0.05	0.04	0.34	0.34	0.34
v/c Ratio	0.30	0.64	0.13	0.34	0.08	0.82	0.78	0.25
Control Delay	34.3	61.7	13.2	65.7	0.8	49.5	45.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	61.7	13.2	65.7	0.8	49.5	45.7	4.5
LOS	C	E	B	E	A	D	D	A
Approach Delay	34.3		29.0				41.0	
Approach LOS	C		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 37.6	Intersection LOS: D
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	269	42	97	200	0	29	0	15	696	138	150
Future Volume (veh/h)	0	269	42	97	200	0	29	0	15	696	138	150
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	277	43	100	206	0	30	0	15	819	0	155
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1577	242	120	2196	0	0	0	0	929	0	439
Arrive On Green	0.00	0.53	0.53	0.15	1.00	0.00	0.00	0.00	0.00	0.29	0.00	0.29
Sat Flow, veh/h	0	3063	456	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	158	162	100	206	0		0.0		819	0	155
Grp Sat Flow(s),veh/h/ln	0	1710	1719	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	5.7	5.9	7.2	0.0	0.0				29.0	0.0	9.6
Cycle Q Clear(g_c), s	0.0	5.7	5.9	7.2	0.0	0.0				29.0	0.0	9.6
Prop In Lane	0.00		0.27	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	907	912	120	2196	0				929	0	439
V/C Ratio(X)	0.00	0.17	0.18	0.83	0.09	0.00				0.88	0.00	0.35
Avail Cap(c_a), veh/h	0	907	912	169	2196	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.6	14.6	50.3	0.0	0.0				40.8	0.0	33.9
Incr Delay (d2), s/veh	0.0	0.4	0.4	20.8	0.1	0.0				5.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.8	2.9	3.9	0.0	0.0				13.6	0.0	4.1
LnGrp Delay(d),s/veh	0.0	15.0	15.0	71.2	0.1	0.0				46.0	0.0	34.4
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		320			306						974	
Approach Delay, s/veh		15.0			23.3						44.1	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.4	68.6		37.9		82.1		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	12.5	23.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.2	7.9		31.0		2.0		
Green Ext Time (p_c), s	0.1	1.8		3.5		2.1		

Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1098	47	3	518	193	13
Future Volume (vph)	1098	47	3	518	193	13
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	72.5	72.5	5.0	74.2	18.4	18.4
Actuated g/C Ratio	0.70	0.70	0.05	0.71	0.18	0.18
v/c Ratio	0.95	0.05	0.04	0.44	0.73	0.05
Control Delay	33.1	3.2	53.0	8.2	56.3	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	3.2	53.0	8.2	56.3	16.8
LOS	C	A	D	A	E	B
Approach Delay	31.9			8.4	53.9	
Approach LOS	C			A	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 104	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 27.8	Intersection LOS: C
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1098	47	3	518	193	13
Future Volume (veh/h)	1098	47	3	518	193	13
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1193	51	3	563	210	14
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1241	1055	6	1329	244	231
Arrive On Green	0.69	0.69	0.00	0.74	0.15	0.15
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1193	51	3	563	210	14
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	62.3	1.1	0.2	12.2	12.9	0.8
Cycle Q Clear(g_c), s	62.3	1.1	0.2	12.2	12.9	0.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1241	1055	6	1329	244	231
V/C Ratio(X)	0.96	0.05	0.46	0.42	0.86	0.06
Avail Cap(c_a), veh/h	1270	1080	79	1439	428	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.6	5.1	50.8	5.1	42.3	37.2
Incr Delay (d2), s/veh	16.6	0.0	18.0	0.2	8.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	36.2	0.5	0.1	6.0	6.4	0.3
LnGrp Delay(d),s/veh	31.2	5.1	68.8	5.3	50.9	37.3
LnGrp LOS	C	A	E	A	D	D
Approach Vol, veh/h	1244			566	224	
Approach Delay, s/veh	30.2			5.6	50.1	
Approach LOS	C			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.0	76.6				81.7		20.5
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.2	64.3				14.2		14.9
Green Ext Time (p_c), s	0.0	6.1				23.1		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	37	0	206	46	4
Future Vol, veh/h	0	37	0	206	46	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	40	0	224	50	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	52	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	1021	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	1021	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1021	-	-
HCM Lane V/C Ratio	-	0.039	-	-
HCM Control Delay (s)	-	8.7	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	26	180	1	6	77
Future Vol, veh/h	5	26	180	1	6	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	28	196	1	7	84

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	293	196	0	0	197	0
Stage 1	196	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	702	850	-	-	1388	-
Stage 1	842	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	698	850	-	-	1388	-
Mov Cap-2 Maneuver	718	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	927	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	826	1388	-
HCM Lane V/C Ratio	-	-	0.041	0.005	-
HCM Control Delay (s)	-	-	9.5	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	3	1	163	78	4
Future Vol, veh/h	19	3	1	163	78	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	21	3	1	177	85	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	266	87	89	0	-	0
Stage 1	87	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	727	977	1519	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	857	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	726	977	1519	-	-	-
Mov Cap-2 Maneuver	737	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	856	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1519	-	763	-	-
HCM Lane V/C Ratio	0.001	-	0.031	-	-
HCM Control Delay (s)	7.4	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	8	155	1	2	78
Future Vol, veh/h	5	8	155	1	2	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	9	168	1	2	85

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	258	169	0	0	170	0
Stage 1	169	-	-	-	-	-
Stage 2	89	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	735	880	-	-	1420	-
Stage 1	866	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	734	880	-	-	1420	-
Mov Cap-2 Maneuver	743	-	-	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	822	1420	-
HCM Lane V/C Ratio	-	-	0.017	0.002	-
HCM Control Delay (s)	-	-	9.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	56	3	10	101	72	12
Future Vol, veh/h	56	3	10	101	72	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	61	3	11	110	78	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	217	85	91	0	-	0
Stage 1	85	-	-	-	-	-
Stage 2	132	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	776	980	1517	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	899	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	980	1517	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	892	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1517	-	777	-	-
HCM Lane V/C Ratio	0.007	-	0.083	-	-
HCM Control Delay (s)	7.4	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	21	5	74	68	7
Future Vol, veh/h	36	21	5	74	68	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	39	23	5	80	74	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	169	78	82	0	-	0
Stage 1	78	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	826	988	1528	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	824	988	1528	-	-	-
Mov Cap-2 Maneuver	806	-	-	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	935	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1528	-	865	-	-
HCM Lane V/C Ratio	0.004	-	0.072	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	44	14	3	35	79	11
Future Vol, veh/h	44	14	3	35	79	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	48	15	3	38	86	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	137	92	98	0	-	0
Stage 1	92	-	-	-	-	-
Stage 2	45	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	861	971	1508	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	859	971	1508	-	-	-
Mov Cap-2 Maneuver	828	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	981	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1508	-	859	-	-
HCM Lane V/C Ratio	0.002	-	0.073	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	9	2	21	88	4
Future Vol, veh/h	17	9	2	21	88	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	18	10	2	23	96	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	125	98	100	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	27	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	875	963	1505	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	874	963	1505	-	-	-
Mov Cap-2 Maneuver	834	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	1000	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1505	-	875	-	-
HCM Lane V/C Ratio	0.001	-	0.032	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	310	118	4	16	81
Future Vol, veh/h	20	310	118	4	16	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	22	337	128	4	17	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	128	0	-	0	508	128
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	380	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1470	-	-	-	528	927
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	696	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1470	-	-	-	520	927
Mov Cap-2 Maneuver	-	-	-	-	633	-
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	686	-

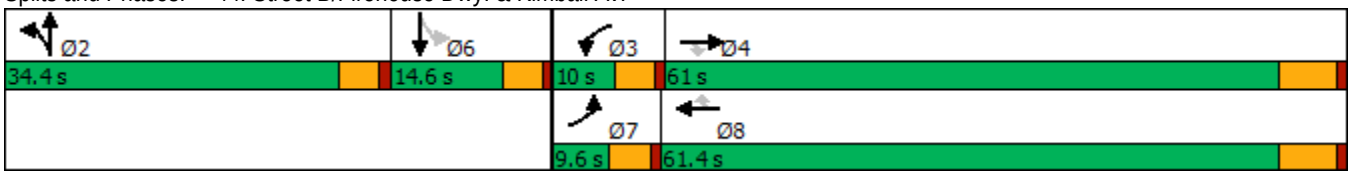
Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1470	-	-	-	633	927
HCM Lane V/C Ratio	0.015	-	-	-	0.027	0.095
HCM Control Delay (s)	7.5	-	-	-	10.8	9.3
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.3

Lane Group	EBT	EBR	WBL	WBT	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	1088	23	8	425	0		
Future Volume (vph)	1088	23	8	425	0		
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		3	8	2	6	7
Permitted Phases		4					
Detector Phase	4	4	3	8	2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	24.2	24.2	9.6	16.2	31.6	14.6	9.6
Total Split (s)	61.0	61.0	10.0	61.4	34.4	14.6	9.6
Total Split (%)	50.8%	50.8%	8.3%	51.2%	28.7%	12%	8%
Yellow Time (s)	5.2	5.2	3.6	5.2	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.2	6.2	4.6	6.2	4.6		
Lead/Lag	Lag	Lag	Lead	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	Min	Min	None
Act Effct Green (s)	30.4	30.4	5.4	31.7	12.8		
Actuated g/C Ratio	0.42	0.42	0.08	0.44	0.18		
v/c Ratio	0.75	0.03	0.06	0.56	0.33		
Control Delay	21.2	0.1	41.6	17.4	11.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	21.2	0.1	41.6	17.4	11.7		
LOS	C	A	D	B	B		
Approach Delay	20.8			17.8	11.7		
Approach LOS	C			B	B		

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 71.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 49.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1088	23	8	425	0	96	0	35	0	0	0
Future Volume (veh/h)	0	1088	23	8	425	0	96	0	35	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	1145	24	8	447	0	101	0	37	0	0	0
Adj No. of Lanes	1	2	1	1	1	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	1707	726	17	1041	884	247	0	90	0	4	0
Arrive On Green	0.00	0.47	0.47	0.01	0.58	0.00	0.20	0.00	0.20	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	1800	1530	1215	0	445	0	1800	0
Grp Volume(v), veh/h	0	1145	24	8	447	0	138	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1661	0	0	0	1800	0
Q Serve(g_s), s	0.0	12.1	0.4	0.2	6.9	0.0	3.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	12.1	0.4	0.2	6.9	0.0	3.6	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.73		0.27	0.00		0.00
Lane Grp Cap(c), veh/h	3	1707	726	17	1041	884	337	0	0	0	4	0
V/C Ratio(X)	0.00	0.67	0.03	0.47	0.43	0.00	0.41	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	164	4002	1701	177	2016	1713	1004	0	0	0	365	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	10.0	6.9	24.3	5.8	0.0	17.1	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	7.3	0.3	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.0	0.2	0.1	3.4	0.0	1.7	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	10.5	6.9	31.5	6.1	0.0	17.9	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		B	A	C	A		B					
Approach Vol, veh/h		1169			455			138			0	
Approach Delay, s/veh		10.4			6.6			17.9			0.0	
Approach LOS		B			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.6	5.1	29.6		0.0	0.0	34.7
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		29.8	5.4	54.8		10.0	5.0	55.2
Max Q Clear Time (g_c+I1), s		5.6	2.2	14.1		0.0	0.0	8.9
Green Ext Time (p_c), s		0.8	0.0	9.3		0.0	0.0	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.0
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	5.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	85	51	0	21	12
Future Vol, veh/h	0	85	51	0	21	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	92	55	0	23	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	114	55	0	0	55	0
Stage 1	55	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	887	1018	-	-	1563	-
Stage 1	973	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	874	1018	-	-	1563	-
Mov Cap-2 Maneuver	874	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	4.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1018	1563	-
HCM Lane V/C Ratio	-	-	0.091	0.015	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1091	42	2	407	13	5
Future Vol, veh/h	1091	42	2	407	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1173	45	2	438	14	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1218	0	1638	609
Stage 1	-	-	-	-	1196	-
Stage 2	-	-	-	-	442	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	580	-	102	443
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	580	-	102	443
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	650	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	19.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	232	443	-	-	580	-
HCM Lane V/C Ratio	0.06	0.012	-	-	0.004	-
HCM Control Delay (s)	21.5	13.2	-	-	11.2	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	975	18	335	74	8
Future Volume (vph)	975	18	335	74	8
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	21.7	5.2	23.1	10.4	10.4
Actuated g/C Ratio	0.48	0.12	0.51	0.23	0.23
v/c Ratio	0.71	0.10	0.38	0.21	0.02
Control Delay	12.1	23.4	7.4	19.1	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	23.4	7.4	19.1	12.1
LOS	B	C	A	B	B
Approach Delay	12.1		8.3	18.5	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 45.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	975	121	18	335	74	8
Future Volume (veh/h)	975	121	18	335	74	8
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1026	127	19	353	78	6
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1393	172	38	1029	327	309
Arrive On Green	0.46	0.46	0.02	0.57	0.20	0.20
Sat Flow, veh/h	3143	378	1619	1800	1619	1530
Grp Volume(v), veh/h	574	579	19	353	78	6
Grp Sat Flow(s),veh/h/ln	1710	1720	1619	1800	1619	1530
Q Serve(g_s), s	13.7	13.8	0.6	5.2	2.0	0.2
Cycle Q Clear(g_c), s	13.7	13.8	0.6	5.2	2.0	0.2
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	780	785	38	1029	327	309
V/C Ratio(X)	0.74	0.74	0.51	0.34	0.24	0.02
Avail Cap(c_a), veh/h	989	995	165	1391	327	309
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	11.1	24.1	5.7	16.7	16.0
Incr Delay (d2), s/veh	2.2	2.2	3.9	0.2	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	6.9	0.3	2.6	1.0	0.1
LnGrp Delay(d),s/veh	13.3	13.3	28.0	5.9	18.4	16.1
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	1153			372	84	
Approach Delay, s/veh	13.3			7.0	18.2	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	29.0				34.8		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	2.6	15.8				7.2		4.0
Green Ext Time (p_c), s	0.0	7.0				10.7		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	907	33	288	65	21
Future Volume (vph)	907	33	288	65	21
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	21.6	5.6	24.9	10.5	10.5
Actuated g/C Ratio	0.46	0.12	0.53	0.22	0.22
v/c Ratio	0.71	0.18	0.32	0.19	0.06
Control Delay	13.4	25.6	6.3	20.9	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	25.6	6.3	20.9	13.8
LOS	B	C	A	C	B
Approach Delay	13.4		8.3	19.2	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 46.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 48.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	907	111	33	288	65	21
Future Volume (veh/h)	907	111	33	288	65	21
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	975	119	35	310	70	17
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1351	165	63	1034	331	313
Arrive On Green	0.44	0.44	0.04	0.57	0.20	0.20
Sat Flow, veh/h	3150	373	1619	1800	1619	1530
Grp Volume(v), veh/h	545	549	35	310	70	17
Grp Sat Flow(s),veh/h/ln	1710	1723	1619	1800	1619	1530
Q Serve(g_s), s	12.8	12.8	1.0	4.3	1.8	0.4
Cycle Q Clear(g_c), s	12.8	12.8	1.0	4.3	1.8	0.4
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	755	761	63	1034	331	313
V/C Ratio(X)	0.72	0.72	0.56	0.30	0.21	0.05
Avail Cap(c_a), veh/h	1005	1013	196	1444	331	313
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	23.1	5.3	16.1	15.6
Incr Delay (d2), s/veh	1.7	1.7	2.9	0.2	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	6.3	0.5	2.1	0.9	0.2
LnGrp Delay(d),s/veh	12.9	12.9	25.9	5.5	17.6	16.0
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	1094			345	87	
Approach Delay, s/veh	12.9			7.6	17.3	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.5	27.8				34.3		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.0	14.8				6.3		3.8
Green Ext Time (p_c), s	0.0	6.8				9.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	815	39	13	249	22	20	6	9	52	17	52
Future Vol, veh/h	75	815	39	13	249	22	20	6	9	52	17	52
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	80	867	41	14	265	23	21	6	10	55	18	55

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	288	0	0	913	0	0	1392	1367	458	900	1376	277
Stage 1	-	-	-	-	-	-	1051	1051	-	304	304	-
Stage 2	-	-	-	-	-	-	341	316	-	596	1072	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1286	-	-	755	-	-	112	148	555	249	146	767
Stage 1	-	-	-	-	-	-	246	306	-	710	667	-
Stage 2	-	-	-	-	-	-	678	659	-	462	299	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1286	-	-	755	-	-	91	136	553	225	134	767
Mov Cap-2 Maneuver	-	-	-	-	-	-	179	226	-	321	218	-
Stage 1	-	-	-	-	-	-	230	286	-	666	655	-
Stage 2	-	-	-	-	-	-	600	647	-	416	279	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.5	24	18.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	226	1286	-	-	755	-	-	393
HCM Lane V/C Ratio	0.165	0.062	-	-	0.018	-	-	0.328
HCM Control Delay (s)	24	8	-	-	9.9	-	-	18.6
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-	-	1.4

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	838	38	18	262	22	12
Future Vol, veh/h	838	38	18	262	22	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	952	43	20	298	25	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	995	0	1313	498
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	339	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	703	-	164	523
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	703	-	159	523
Mov Cap-2 Maneuver	-	-	-	-	303	-
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	705	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	356	-	-	703	-
HCM Lane V/C Ratio	0.109	-	-	0.029	-
HCM Control Delay (s)	16.3	-	-	10.3	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	58
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	849	0	0	0	0	0	280	0	0
Future Vol, veh/h	0	0	0	849	0	0	0	0	0	280	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	913	0	0	0	0	0	301	0	0
Number of Lanes	0	0	0	1	0	0	0	0	0	1	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay	72.1	15.3
HCM LOS	F	C

Lane	NBLn1	EBLn1
Vol Left, %	100%	0%
Vol Thru, %	0%	0%
Vol Right, %	0%	100%
Sign Control	Stop	Stop
Traffic Vol by Lane	280	849
LT Vol	280	0
Through Vol	0	0
RT Vol	0	849
Lane Flow Rate	301	913
Geometry Grp	1	1
Degree of Util (X)	0.503	1.073
Departure Headway (Hd)	6.213	4.231
Convergence, Y/N	Yes	Yes
Cap	584	858
Service Time	4.213	2.283
HCM Lane V/C Ratio	0.515	1.064
HCM Control Delay	15.3	72.1
HCM Lane LOS	C	F
HCM 95th-tile Q	2.8	22.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	0	0
Future Vol, veh/h	0	0	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	0	0
Number of Lanes	0	0	0	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

APPENDIX 5.3:

E+P (PROJECT BUILDOUT) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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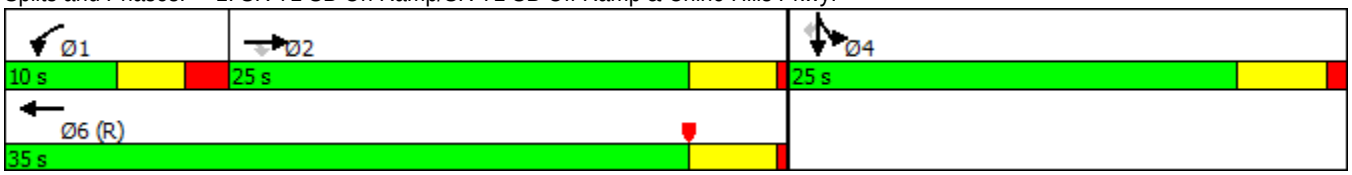
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1162	305	6	919	515	82	384
Future Volume (vph)	1162	305	6	919	515	82	384
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.41	0.36	0.04	0.54	0.60	0.56	0.67
Control Delay	11.5	3.2	27.0	9.4	22.7	21.2	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	3.2	27.0	9.4	22.7	21.2	18.7
LOS	B	A	C	A	C	C	B
Approach Delay	9.7			9.5		20.6	
Approach LOS	A			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1162	305	6	919	0	0	0	0	515	82	384
Future Volume (veh/h)	0	1162	305	6	919	0	0	0	0	515	82	384
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1198	244	6	947	0				592	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1198	244	6	947	0				592	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	8.4	6.6	0.2	8.5	0.0				8.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.4	6.6	0.2	8.5	0.0				8.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.46	0.38	0.47	0.54	0.00				0.55	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.78	0.78	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.6	12.1	29.6	6.2	0.0				16.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.4	7.4	1.0	0.0				2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	2.8	0.1	4.1	0.0				4.2	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.8	12.5	37.0	7.1	0.0				18.3	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1442			953						592	
Approach Delay, s/veh		12.7			7.3						18.3	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	10.4		10.9		10.5		
Green Ext Time (p_c), s	0.0	8.4		1.2		14.8		

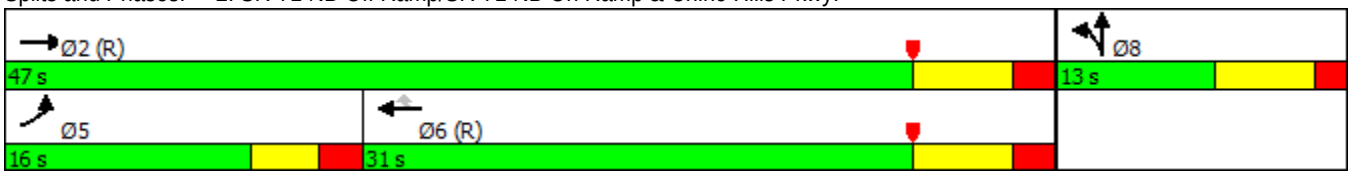
Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	537	1140	564	306	361	192
Future Volume (vph)	537	1140	564	306	361	192
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	47.0	31.0	31.0	13.0	13.0
Total Split (%)	26.7%	78.3%	51.7%	51.7%	21.7%	21.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	40.5	24.5	24.5	7.0	7.0
Actuated g/C Ratio	0.18	0.68	0.41	0.41	0.12	0.12
v/c Ratio	1.05	0.52	0.43	0.46	1.13	1.06
Control Delay	79.5	5.7	13.9	9.4	140.7	93.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	5.7	13.9	9.4	140.7	93.8
LOS	E	A	B	A	F	F
Approach Delay		29.3	12.3			109.2
Approach LOS		C	B			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 39.0	Intersection LOS: D
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	537	1140	0	0	564	306	361	192	9	0	0	0
Future Volume (veh/h)	537	1140	0	0	564	306	361	192	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	565	1200	0	0	594	321	395	181	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	542	2308	0	0	1396	615	378	202	7			
Arrive On Green	0.18	0.68	0.00	0.00	0.41	0.41	0.12	0.12	0.12			
Sat Flow, veh/h	2956	3510	0	0	3510	1506	3238	1732	57			
Grp Volume(v), veh/h	565	1200	0	0	594	321	395	0	187			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1506	1619	0	1790			
Q Serve(g_s), s	11.0	10.5	0.0	0.0	7.5	9.6	7.0	0.0	6.2			
Cycle Q Clear(g_c), s	11.0	10.5	0.0	0.0	7.5	9.6	7.0	0.0	6.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	542	2309	0	0	1397	615	378	0	209			
V/C Ratio(X)	1.04	0.52	0.00	0.00	0.43	0.52	1.05	0.00	0.90			
Avail Cap(c_a), veh/h	542	2309	0	0	1397	615	378	0	209			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.89	0.89	0.00	0.00	0.71	0.71	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.5	4.9	0.0	0.0	12.7	13.3	26.5	0.0	26.1			
Incr Delay (d2), s/veh	48.1	0.8	0.0	0.0	0.7	2.2	58.7	0.0	39.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.1	5.1	0.0	0.0	3.6	4.3	6.2	0.0	5.4			
LnGrp Delay(d),s/veh	72.6	5.6	0.0	0.0	13.4	15.6	85.2	0.0	66.1			
LnGrp LOS	F	A			B	B	F		E			
Approach Vol, veh/h		1765			915			582				
Approach Delay, s/veh		27.1			14.2			79.1				
Approach LOS		C			B			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.0			16.0	31.0		13.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		40.5			11.0	24.5		7.0
Max Q Clear Time (g_c+I1), s		12.5			13.0	11.6		9.0
Green Ext Time (p_c), s		16.5			0.0	9.6		0.0

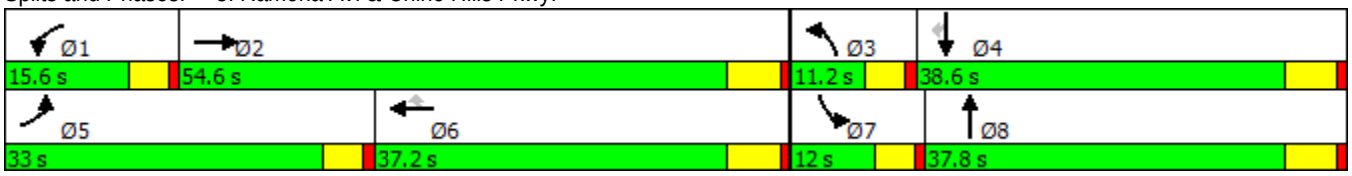
Intersection Summary	
HCM 2010 Ctrl Delay	32.7
HCM 2010 LOS	C

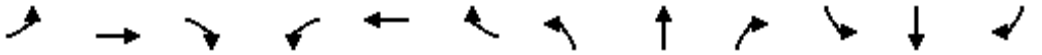
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	340	805	65	603	92	26	384	87	174	241
Future Volume (vph)	340	805	65	603	92	26	384	87	174	241
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	27.3	48.5	8.7	27.7	27.7	6.0	32.1	7.4	37.7	37.7
Actuated g/C Ratio	0.24	0.42	0.08	0.24	0.24	0.05	0.28	0.06	0.33	0.33
v/c Ratio	0.94	0.41	0.56	0.77	0.20	0.33	0.59	0.89	0.16	0.38
Control Delay	77.3	24.8	70.0	48.1	2.0	65.0	36.8	118.3	30.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.3	24.8	70.0	48.1	2.0	65.0	36.8	118.3	30.9	6.0
LOS	E	C	E	D	A	E	D	F	C	A
Approach Delay		40.3		44.3			38.1		34.1	
Approach LOS		D		D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 39.9	Intersection LOS: D
Intersection Capacity Utilization 88.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	805	4	65	603	92	26	384	144	87	174	241
Future Volume (veh/h)	340	805	4	65	603	92	26	384	144	87	174	241
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	358	847	3	68	635	80	27	404	84	92	183	158
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	2160	8	85	836	368	41	779	160	104	1079	474
Arrive On Green	0.24	0.43	0.43	0.05	0.24	0.24	0.03	0.28	0.28	0.06	0.32	0.32
Sat Flow, veh/h	1619	5055	18	1619	3420	1507	1619	2817	580	1619	3420	1504
Grp Volume(v), veh/h	358	549	301	68	635	80	27	244	244	92	183	158
Grp Sat Flow(s),veh/h/ln	1619	1638	1797	1619	1710	1507	1619	1710	1687	1619	1710	1504
Q Serve(g_s), s	25.1	13.3	13.3	4.8	19.9	4.9	1.9	13.9	14.2	6.5	4.5	9.3
Cycle Q Clear(g_c), s	25.1	13.3	13.3	4.8	19.9	4.9	1.9	13.9	14.2	6.5	4.5	9.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	381	1400	768	85	836	368	41	473	467	104	1079	474
V/C Ratio(X)	0.94	0.39	0.39	0.80	0.76	0.22	0.67	0.52	0.52	0.89	0.17	0.33
Avail Cap(c_a), veh/h	397	1400	768	154	928	409	92	473	467	104	1079	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	22.8	22.8	54.2	40.6	34.9	55.9	35.3	35.4	53.7	28.6	30.3
Incr Delay (d2), s/veh	29.2	0.3	0.5	6.4	3.7	0.4	6.8	4.0	4.2	53.3	0.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	6.1	6.7	2.3	9.9	2.1	0.9	7.1	7.1	4.4	2.2	4.1
LnGrp Delay(d),s/veh	72.6	23.0	23.3	60.7	44.3	35.3	62.7	39.3	39.5	107.0	29.0	32.2
LnGrp LOS	E	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1208			783			515			433	
Approach Delay, s/veh		37.8			44.8			40.6			46.7	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	55.2	7.5	42.3	31.8	34.1	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	6.8	15.3	3.9	11.3	27.1	21.9	8.5	16.2
Green Ext Time (p_c), s	0.0	16.8	0.0	4.3	0.1	6.3	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	41.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	827	93	27	644	105	31
Future Vol, veh/h	827	93	27	644	105	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	909	102	30	708	115	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	909	0	1322	454
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	413	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	757	-	150	559
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	642	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	757	-	144	559
Mov Cap-2 Maneuver	-	-	-	-	315	-
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	617	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	22.7
HCM LOS			C

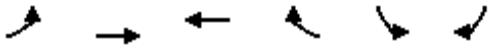
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	350	-	-	757	-
HCM Lane V/C Ratio	0.427	-	-	0.039	-
HCM Control Delay (s)	22.7	-	-	9.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.1	-	-	0.1	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	212	645	576	64	94
Future Volume (vph)	212	645	576	64	94
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	90.0	48.0	30.0	42.0
Total Split (%)	35.0%	75.0%	40.0%	25.0%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	16.3	44.2	23.2	24.6	42.2
Actuated g/C Ratio	0.20	0.55	0.29	0.31	0.52
v/c Ratio	0.71	0.37	0.67	0.08	0.12
Control Delay	42.9	10.5	29.3	24.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	10.5	29.3	24.1	2.5
LOS	D	B	C	C	A
Approach Delay		18.5	29.3	11.3	
Approach LOS		B	C	B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 80.6
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 21.8 — Intersection LOS: C
Intersection Capacity Utilization 52.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	212	645	576	30	64	94
Future Volume (veh/h)	212	645	576	30	64	94
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	230	701	626	33	70	27
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	268	1921	1125	59	876	706
Arrive On Green	0.17	0.56	0.34	0.34	0.30	0.30
Sat Flow, veh/h	1619	3510	3395	174	2956	1530
Grp Volume(v), veh/h	230	701	324	335	70	27
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1769	1478	1530
Q Serve(g_s), s	11.3	9.2	12.6	12.6	1.4	0.8
Cycle Q Clear(g_c), s	11.3	9.2	12.6	12.6	1.4	0.8
Prop In Lane	1.00			0.10	1.00	1.00
Lane Grp Cap(c), veh/h	268	1921	582	602	876	706
V/C Ratio(X)	0.86	0.36	0.56	0.56	0.08	0.04
Avail Cap(c_a), veh/h	741	3525	883	914	876	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	9.9	21.9	21.9	20.7	12.1
Incr Delay (d2), s/veh	3.1	0.2	1.2	1.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	4.3	6.1	6.3	0.6	1.0
LnGrp Delay(d),s/veh	36.3	10.0	23.1	23.1	20.9	12.2
LnGrp LOS	D	B	C	C	C	B
Approach Vol, veh/h		931	659		97	
Approach Delay, s/veh		16.5	23.1		18.5	
Approach LOS		B	C		B	

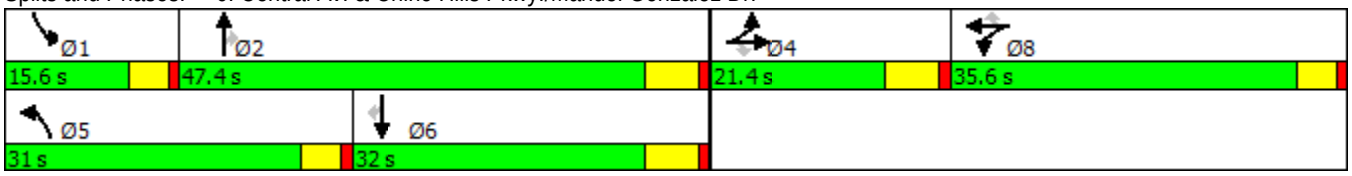
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		51.7		30.0	18.1	33.6		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		84.2		24.2	37.4	42.2		
Max Q Clear Time (g_c+I1), s		11.2		3.4	13.3	14.6		
Green Ext Time (p_c), s		17.8		0.2	0.3	13.2		

Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	50	267	2	3	7	328	793	43	62	655	245
Future Volume (vph)	295	50	267	2	3	7	328	793	43	62	655	245
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.5	15.5	15.5	13.5	13.5	13.5	26.9	47.9	47.9	8.0	26.7	26.7
Actuated g/C Ratio	0.16	0.16	0.16	0.14	0.14	0.14	0.29	0.51	0.51	0.09	0.28	0.28
v/c Ratio	0.74	0.69	0.59	0.01	0.01	0.02	0.77	0.50	0.06	0.49	0.73	0.47
Control Delay	58.3	54.3	10.7	35.5	35.3	0.1	46.2	20.5	0.1	56.9	37.9	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	54.3	10.7	35.5	35.3	0.1	46.2	20.5	0.1	56.9	37.9	13.4
LOS	E	D	B	D	D	A	D	C	A	E	D	B
Approach Delay		36.4			13.7			27.0			32.9	
Approach LOS		D			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.1	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 31.1	Intersection LOS: C
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	295	50	267	2	3	7	328	793	43	62	655	245
Future Volume (veh/h)	295	50	267	2	3	7	328	793	43	62	655	245
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	360	0	194	2	3	3	357	862	35	67	712	211
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	507	0	239	33	37	31	393	1761	772	83	1106	489
Arrive On Green	0.16	0.00	0.16	0.02	0.02	0.02	0.24	0.51	0.51	0.05	0.32	0.32
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	360	0	194	2	3	3	357	862	35	67	712	211
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	8.5	0.0	9.9	0.1	0.1	0.2	17.3	13.2	0.9	3.3	14.4	8.9
Cycle Q Clear(g_c), s	8.5	0.0	9.9	0.1	0.1	0.2	17.3	13.2	0.9	3.3	14.4	8.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	507	0	239	33	37	31	393	1761	772	83	1106	489
V/C Ratio(X)	0.71	0.00	0.81	0.06	0.08	0.10	0.91	0.49	0.05	0.81	0.64	0.43
Avail Cap(c_a), veh/h	624	0	295	620	689	586	528	1761	772	220	1106	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	0.0	33.0	38.9	38.9	38.9	29.8	12.7	9.8	38.0	23.4	21.5
Incr Delay (d2), s/veh	2.9	0.0	12.9	0.8	0.9	1.3	13.7	1.0	0.1	6.7	2.9	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	5.0	0.1	0.1	0.1	9.2	6.5	0.4	1.6	7.2	4.1
LnGrp Delay(d),s/veh	35.3	0.0	45.9	39.7	39.9	40.3	43.5	13.7	9.9	44.7	26.3	24.3
LnGrp LOS	D		D	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		554			8			1254			990	
Approach Delay, s/veh		39.0			40.0			22.1			27.1	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.8	47.5		18.5	24.3	32.0		6.2
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.3	15.2		11.9	19.3	16.4		2.2
Green Ext Time (p_c), s	0.0	17.2		0.8	0.3	7.9		0.0

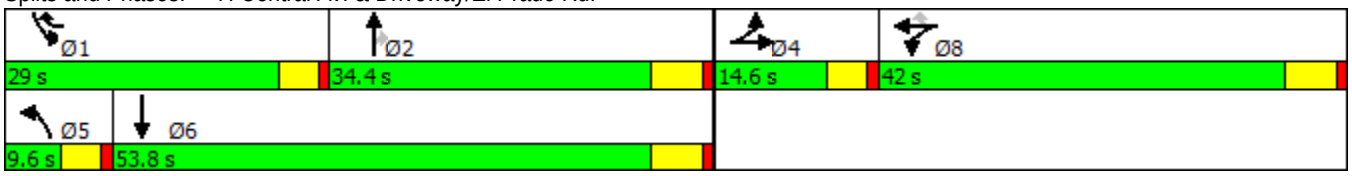
Intersection Summary	
HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	908	3	453	2	738	606	399	603
Future Volume (vph)	1	1	908	3	453	2	738	606	399	603
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	0.98	0.93	0.48	0.03	0.91	0.75	1.22	0.27
Control Delay	48.0	41.0	72.6	61.1	6.6	53.0	53.7	9.0	157.5	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	72.6	61.1	6.6	53.0	53.7	9.0	157.5	16.2
LOS	D	D	E	E	A	D	D	A	F	B
Approach Delay		43.3		46.8			33.5			71.9
Approach LOS		D		D			C			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 48.8	Intersection LOS: D
Intersection Capacity Utilization 94.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	908	3	453	2	738	606	399	603	9
Future Volume (veh/h)	1	1	1	908	3	453	2	738	606	399	603	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1011	0	360	2	820	504	443	670	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1055	0	836	4	883	390	357	2382	28
Arrive On Green	0.01	0.01	0.01	0.33	0.00	0.33	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5006	60
Grp Volume(v), veh/h	1	0	2	1011	0	360	2	820	504	443	438	240
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	33.9	0.0	15.5	0.1	25.9	28.6	24.4	9.0	9.0
Cycle Q Clear(g_c), s	0.1	0.0	0.1	33.9	0.0	15.5	0.1	25.9	28.6	24.4	9.0	9.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1055	0	836	4	883	390	357	1559	851
V/C Ratio(X)	0.08	0.00	0.15	0.96	0.00	0.43	0.46	0.93	1.29	1.24	0.28	0.28
Avail Cap(c_a), veh/h	146	0	149	1058	0	837	73	883	390	357	1559	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.5	0.0	54.6	36.6	0.0	14.9	55.2	40.1	41.1	43.2	17.6	17.6
Incr Delay (d2), s/veh	0.9	0.0	2.0	18.4	0.0	0.4	25.4	17.3	149.6	130.6	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	17.9	0.0	6.6	0.1	14.3	28.0	23.7	4.1	4.6
LnGrp Delay(d),s/veh	55.5	0.0	56.5	55.0	0.0	15.3	80.6	57.4	190.7	173.8	18.0	18.4
LnGrp LOS	E		E	E		B	F	E	F	F	B	B
Approach Vol, veh/h		3			1371			1326			1121	
Approach Delay, s/veh		56.2			44.6			108.1			79.7	
Approach LOS		E			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		41.9
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	11.0		35.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	22.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	76.9
HCM 2010 LOS	E

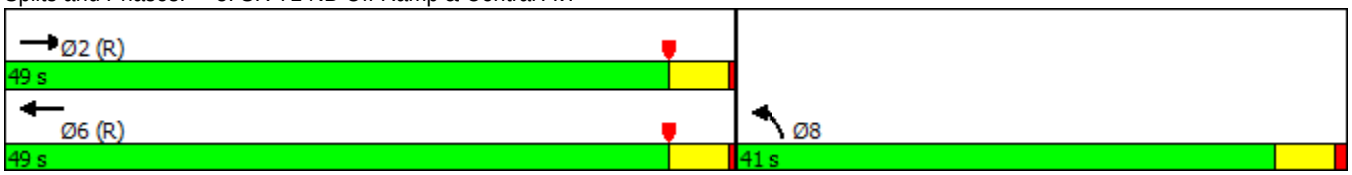
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1075	836	97
Future Volume (vph)	1075	836	97
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	49.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	59.1	59.1	21.4
Actuated g/C Ratio	0.66	0.66	0.24
v/c Ratio	0.71	0.31	1.18dr
Control Delay	6.8	7.5	38.2
Queue Delay	0.0	0.0	0.0
Total Delay	6.8	7.5	38.2
LOS	A	A	D
Approach Delay	6.8	7.5	38.2
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1075	764	0	836	97	364
Future Volume (veh/h)	1075	764	0	836	97	364
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1295	920	0	1007	117	246
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2326	1087	0	3490	298	282
Arrive On Green	1.00	1.00	0.00	0.71	0.18	0.18
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1295	920	0	1007	117	246
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	6.7	5.7	14.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.7	5.7	14.1
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2326	1087	0	3490	298	282
V/C Ratio(X)	0.56	0.85	0.00	0.29	0.39	0.87
Avail Cap(c_a), veh/h	2326	1087	0	3490	648	612
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.8	32.3	35.7
Incr Delay (d2), s/veh	1.0	8.2	0.0	0.2	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.5	0.0	3.1	2.6	6.2
LnGrp Delay(d),s/veh	1.0	8.2	0.0	5.0	32.6	39.0
LnGrp LOS	A	A		A	C	D
Approach Vol, veh/h	2215			1007	363	
Approach Delay, s/veh	4.0			5.0	36.9	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		68.4				68.4		21.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		36.0
Max Q Clear Time (g_c+I1), s		2.0				8.7		16.1
Green Ext Time (p_c), s		26.2				23.6		0.5

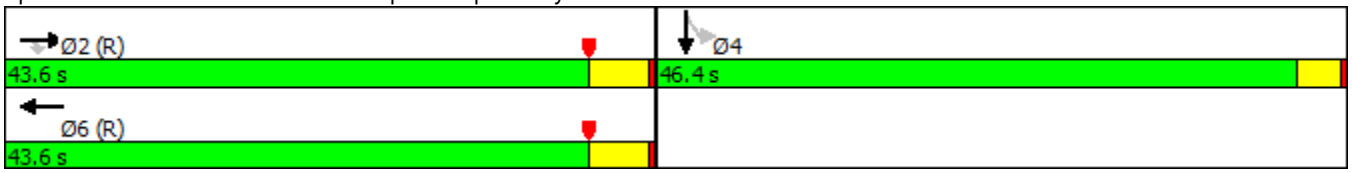
Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1319	69	741	520	0
Future Volume (vph)	1319	69	741	520	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	43.8	43.8	43.8	38.2	38.2
Actuated g/C Ratio	0.49	0.49	0.49	0.42	0.42
v/c Ratio	0.70	0.11	0.50	0.88	0.78
Control Delay	20.9	4.0	11.8	39.3	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	4.0	11.8	39.3	28.1
LOS	C	A	B	D	C
Approach Delay	20.1		11.8		34.0
Approach LOS	C		B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1319	69	0	741	193	0	0	0	520	0	344
Future Volume (veh/h)	0	1319	69	0	741	193	0	0	0	520	0	344
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1670	0	0	938	244				476	254	294
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2678	834	0	2119	550				593	279	323
Arrive On Green	0.00	0.54	0.00	0.00	1.00	1.00				0.37	0.37	0.37
Sat Flow, veh/h	0	5076	1530	0	4051	1009				1619	762	882
Grp Volume(v), veh/h	0	1670	0	0	790	392				476	0	548
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1622				1619	0	1644
Q Serve(g_s), s	0.0	21.1	0.0	0.0	0.0	0.0				23.8	0.0	28.5
Cycle Q Clear(g_c), s	0.0	21.1	0.0	0.0	0.0	0.0				23.8	0.0	28.5
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.54
Lane Grp Cap(c), veh/h	0	2678	834	0	1785	884				593	0	602
V/C Ratio(X)	0.00	0.62	0.00	0.00	0.44	0.44				0.80	0.00	0.91
Avail Cap(c_a), veh/h	0	2678	834	0	1785	884				772	0	784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.1	0.0	0.0	0.0	0.0				25.6	0.0	27.1
Incr Delay (d2), s/veh	0.0	1.1	0.0	0.0	0.8	1.6				3.5	0.0	10.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.7	0.0	0.0	0.2	0.4				11.2	0.0	14.7
LnGrp Delay(d),s/veh	0.0	15.2	0.0	0.0	0.8	1.6				29.1	0.0	37.8
LnGrp LOS		B			A	A				C		D
Approach Vol, veh/h		1670			1182						1024	
Approach Delay, s/veh		15.2			1.1						33.8	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		53.5		36.5		53.5		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		23.1		30.5		2.0		
Green Ext Time (p_c), s		12.9		2.4		24.0		

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

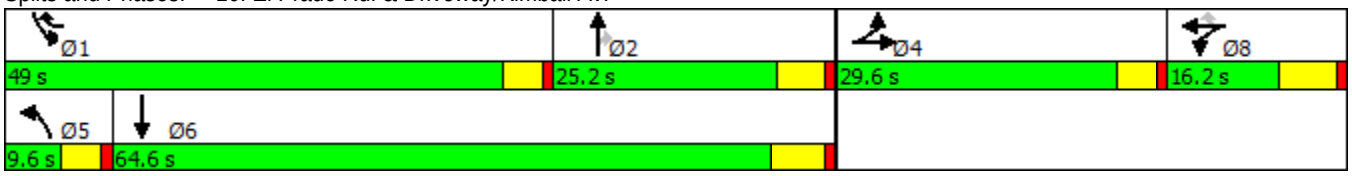
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	1	25	1094	5	270	31	673	195
Future Volume (vph)	11	1	25	1094	5	270	31	673	195
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.4	58.3	5.2	19.1	19.1	46.0	59.2
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.62
v/c Ratio	0.05	0.01	0.28	0.94	0.06	0.76	0.07	0.88	0.12
Control Delay	40.1	30.3	49.4	25.7	52.6	53.8	0.3	40.7	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.3	49.4	25.7	52.6	53.8	0.3	40.7	9.3
LOS	D	C	D	C	D	D	A	D	A
Approach Delay		38.0	26.8			48.3			32.5
Approach LOS		D	C			D			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 94.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 31.9 — Intersection LOS: C
Intersection Capacity Utilization 106.8% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	2	27	25	1094	5	270	31	673	195	41
Future Volume (veh/h)	11	1	2	27	25	1094	5	270	31	673	195	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	1	1	28	26	255	5	276	32	687	199	42
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	50	25	25	100	93	844	89	330	281	714	1607	333
Arrive On Green	0.03	0.03	0.03	0.11	0.11	0.11	0.06	0.18	0.18	0.44	0.57	0.57
Sat Flow, veh/h	1619	827	827	910	845	1530	1619	1800	1530	1619	2822	584
Grp Volume(v), veh/h	11	0	2	54	0	255	5	276	32	687	119	122
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1696
Q Serve(g_s), s	0.6	0.0	0.1	2.6	0.0	8.1	0.3	13.4	1.6	37.3	2.9	3.0
Cycle Q Clear(g_c), s	0.6	0.0	0.1	2.6	0.0	8.1	0.3	13.4	1.6	37.3	2.9	3.0
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	50	0	51	194	0	844	89	330	281	714	974	966
V/C Ratio(X)	0.22	0.00	0.04	0.28	0.00	0.30	0.06	0.84	0.11	0.96	0.12	0.13
Avail Cap(c_a), veh/h	447	0	457	194	0	844	89	397	338	794	1110	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	0.0	42.6	37.0	0.0	10.9	40.6	35.7	30.8	24.6	9.0	9.0
Incr Delay (d2), s/veh	2.2	0.0	0.3	0.8	0.0	0.2	0.1	12.4	0.2	21.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	1.3	0.0	3.4	0.1	7.8	0.7	20.8	1.4	1.4
LnGrp Delay(d),s/veh	45.0	0.0	42.9	37.8	0.0	11.1	40.6	48.0	31.0	45.9	9.1	9.1
LnGrp LOS	D		D	D		B	D	D	C	D	A	A
Approach Vol, veh/h		13			309			313			928	
Approach Delay, s/veh		44.7			15.8			46.2			36.3	
Approach LOS		D			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	44.6	22.4		7.4	9.6	57.4		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	39.3	15.4		2.6	2.3	5.0		10.1
Green Ext Time (p_c), s	0.7	1.2		0.0	0.0	3.1		0.0

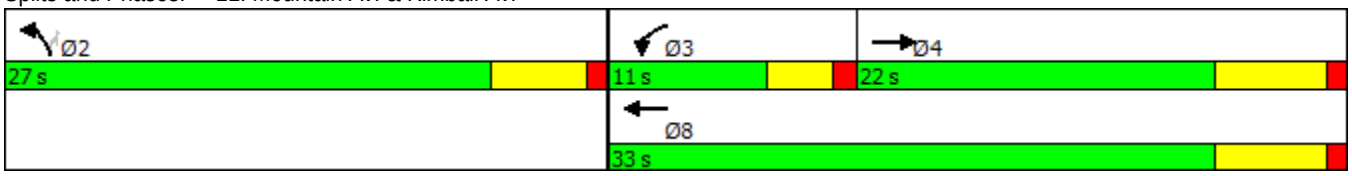
Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	629	77	945	244	19
Future Volume (vph)	629	77	945	244	19
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	14.1	7.6	19.5	11.5	11.5
Actuated g/C Ratio	0.33	0.18	0.45	0.27	0.27
v/c Ratio	0.68	0.28	0.64	0.59	0.05
Control Delay	18.1	23.4	11.2	21.7	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	23.4	11.2	21.7	7.3
LOS	B	C	B	C	A
Approach Delay	18.1		12.2	20.6	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 55.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	629	90	77	945	244	19
Future Volume (veh/h)	629	90	77	945	244	19
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	655	89	80	984	254	15
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	951	129	166	1767	328	310
Arrive On Green	0.31	0.31	0.10	0.52	0.20	0.20
Sat Flow, veh/h	3117	411	1619	3510	1619	1530
Grp Volume(v), veh/h	370	374	80	984	254	15
Grp Sat Flow(s),veh/h/ln	1710	1728	1619	1710	1619	1530
Q Serve(g_s), s	7.6	7.6	1.9	7.9	6.0	0.3
Cycle Q Clear(g_c), s	7.6	7.6	1.9	7.9	6.0	0.3
Prop In Lane		0.24	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	538	543	166	1767	328	310
V/C Ratio(X)	0.69	0.69	0.48	0.56	0.77	0.05
Avail Cap(c_a), veh/h	680	687	282	2294	873	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.1	12.1	17.0	6.6	15.2	12.9
Incr Delay (d2), s/veh	1.2	1.2	0.8	0.1	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.7	0.9	3.6	2.7	0.1
LnGrp Delay(d),s/veh	13.2	13.3	17.8	6.7	16.7	12.9
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	744			1064	269	
Approach Delay, s/veh	13.3			7.5	16.4	
Approach LOS	B			A	B	

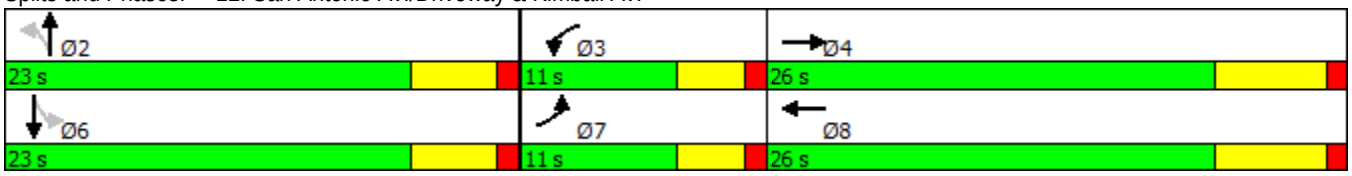
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.5	8.1	18.7				26.8
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		8.0	3.9	9.6				9.9
Green Ext Time (p_c), s		0.2	0.0	3.0				4.9

Intersection Summary	
HCM 2010 Ctrl Delay	10.7
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	578	35	1027	42	0		
Future Volume (vph)	578	35	1027	42	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	26.0	11.0	26.0	23.0	23.0	23.0	11.0
Total Split (%)	43.3%	18.3%	43.3%	38.3%	38.3%	38%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	18.0	7.4	19.5	8.8	8.8		
Actuated g/C Ratio	0.45	0.19	0.49	0.22	0.22		
v/c Ratio	0.44	0.12	0.65	0.16	0.02		
Control Delay	9.8	19.0	10.0	15.3	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	9.8	19.0	10.0	15.3	0.1		
LOS	A	B	A	B	A		
Approach Delay	9.8		10.3		11.5		
Approach LOS	A		B		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 39.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 47.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	578	56	35	1027	0	42	0	14	0	0	0
Future Volume (veh/h)	0	578	56	35	1027	0	42	0	14	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	615	60	37	1093	0	45	0	12	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	4	1066	104	97	1741	0	508	0	294	198	346	0
Arrive On Green	0.00	0.34	0.34	0.06	0.51	0.00	0.19	0.00	0.19	0.00	0.00	0.00
Sat Flow, veh/h	1619	3142	306	1619	3510	0	1619	0	1530	1345	1800	0
Grp Volume(v), veh/h	0	334	341	37	1093	0	45	0	12	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1738	1619	1710	0	1619	0	1530	1345	1800	0
Q Serve(g_s), s	0.0	5.9	5.9	0.8	8.4	0.0	0.8	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.9	5.9	0.8	8.4	0.0	0.8	0.0	0.2	0.0	0.0	0.0
Prop In Lane	1.00		0.18	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	580	590	97	1741	0	508	0	294	198	346	0
V/C Ratio(X)	0.00	0.58	0.58	0.38	0.63	0.00	0.09	0.00	0.04	0.00	0.00	0.00
Avail Cap(c_a), veh/h	311	938	954	311	1876	0	1001	0	760	607	894	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.9	9.9	16.5	6.5	0.0	12.2	0.0	12.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.7	2.8	0.4	3.9	0.0	0.4	0.0	0.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	10.2	10.2	17.4	6.9	0.0	12.3	0.0	12.0	0.0	0.0	0.0
LnGrp LOS		B	B	B	A		B		B			
Approach Vol, veh/h		675			1130			57			0	
Approach Delay, s/veh		10.2			7.2			12.2			0.0	
Approach LOS		B			A			B				

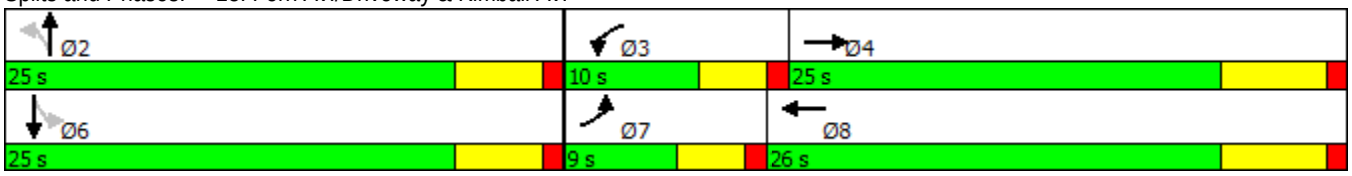
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.2	18.4		11.9	0.0	24.6
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		2.8	2.8	7.9		0.0	0.0	10.4
Green Ext Time (p_c), s		0.0	0.0	4.5		0.0	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	10	507	37	1012	43	0	14	1
Future Volume (vph)	10	507	37	1012	43	0	14	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.3	16.8	5.6	18.9	7.6	7.6	7.6	7.6
Actuated g/C Ratio	0.14	0.43	0.14	0.49	0.20	0.20	0.20	0.20
v/c Ratio	0.05	0.43	0.18	0.68	0.19	0.05	0.07	0.01
Control Delay	20.8	10.8	21.0	13.7	15.7	0.2	14.1	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	10.8	21.0	13.7	15.7	0.2	14.1	10.8
LOS	C	B	C	B	B	A	B	B
Approach Delay		11.0		14.0		10.0		13.5
Approach LOS		B		B		A		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 38.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	507	64	37	1012	3	43	0	25	14	1	3
Future Volume (veh/h)	10	507	64	37	1012	3	43	0	25	14	1	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	563	64	41	1124	3	48	0	18	16	1	2
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	23	1216	138	76	1491	4	397	0	218	383	77	153
Arrive On Green	0.01	0.39	0.39	0.05	0.43	0.43	0.14	0.00	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1619	3089	350	1619	3499	9	1356	0	1530	1338	537	1074
Grp Volume(v), veh/h	11	311	316	41	549	578	48	0	18	16	0	3
Grp Sat Flow(s),veh/h/ln	1619	1710	1729	1619	1710	1798	1356	0	1530	1338	0	1611
Q Serve(g_s), s	0.2	4.7	4.8	0.9	9.5	9.5	1.1	0.0	0.4	0.4	0.0	0.1
Cycle Q Clear(g_c), s	0.2	4.7	4.8	0.9	9.5	9.5	1.2	0.0	0.4	0.7	0.0	0.1
Prop In Lane	1.00		0.20	1.00		0.01	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	23	673	681	76	728	766	397	0	218	383	0	230
V/C Ratio(X)	0.47	0.46	0.46	0.54	0.75	0.75	0.12	0.00	0.08	0.04	0.00	0.01
Avail Cap(c_a), veh/h	231	942	953	277	991	1042	982	0	878	960	0	924
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	7.9	7.9	16.3	8.5	8.5	13.4	0.0	13.0	13.3	0.0	12.9
Incr Delay (d2), s/veh	5.3	0.2	0.2	2.2	1.3	1.3	0.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.2	2.2	0.4	4.7	4.9	0.4	0.0	0.2	0.1	0.0	0.0
LnGrp Delay(d),s/veh	22.4	8.1	8.1	18.5	9.8	9.8	13.4	0.0	13.1	13.4	0.0	12.9
LnGrp LOS	C	A	A	B	A	A	B		B	B		B
Approach Vol, veh/h		638			1168			66			19	
Approach Delay, s/veh		8.3			10.1			13.3			13.3	
Approach LOS		A			B			B			B	

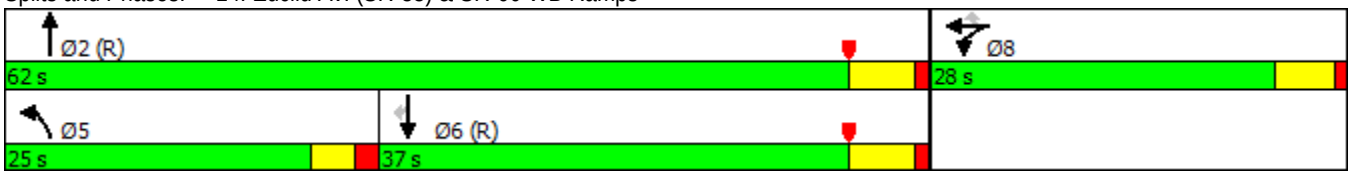
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	5.6	19.5		9.9	4.5	20.6
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.2	2.9	6.8		2.7	2.2	11.5
Green Ext Time (p_c), s		0.1	0.0	4.0		0.1	0.0	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	9.7
HCM 2010 LOS	A

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	670	2	364	305	899	974	461
Future Volume (vph)	670	2	364	305	899	974	461
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.0	23.0	23.0	19.8	56.5	32.2	32.2
Actuated g/C Ratio	0.26	0.26	0.26	0.22	0.63	0.36	0.36
v/c Ratio	0.97	0.96	0.74	0.93	0.45	0.86	0.59
Control Delay	74.8	70.4	28.9	50.8	20.3	35.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Total Delay	74.8	70.4	28.9	50.8	21.9	35.5	5.4
LOS	E	E	C	D	C	D	A
Approach Delay		58.9			29.2	25.8	
Approach LOS		E			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 36.3	Intersection LOS: D
Intersection Capacity Utilization 88.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	670	2	364	305	899	0	0	974	461
Future Volume (veh/h)	0	0	0	670	2	364	305	899	0	0	974	461
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				794	0	158	328	967	0	0	1047	496
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				828	0	391	350	2147	0	0	1236	533
Arrive On Green				0.26	0.00	0.26	0.43	1.00	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1474
Grp Volume(v), veh/h				794	0	158	328	967	0	0	1047	496
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1474
Q Serve(g_s), s				21.8	0.0	7.7	17.4	0.0	0.0	0.0	25.4	29.2
Cycle Q Clear(g_c), s				21.8	0.0	7.7	17.4	0.0	0.0	0.0	25.4	29.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				828	0	391	350	2147	0	0	1236	533
V/C Ratio(X)				0.96	0.00	0.40	0.94	0.45	0.00	0.00	0.85	0.93
Avail Cap(c_a), veh/h				828	0	391	369	2147	0	0	1236	533
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.56	0.56	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.0	0.0	27.8	25.0	0.0	0.0	0.0	26.4	27.7
Incr Delay (d2), s/veh				21.7	0.0	0.3	19.9	0.4	0.0	0.0	7.3	25.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.2	0.0	3.3	9.6	0.1	0.0	0.0	13.2	15.6
LnGrp Delay(d),s/veh				54.8	0.0	28.1	44.9	0.4	0.0	0.0	33.7	52.8
LnGrp LOS				D		C	D	A			C	D
Approach Vol, veh/h					952			1295			1543	
Approach Delay, s/veh					50.4			11.7			39.9	
Approach LOS					D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			24.0	38.0		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			19.4	31.2		23.8
Green Ext Time (p_c), s		39.9			0.1	0.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C

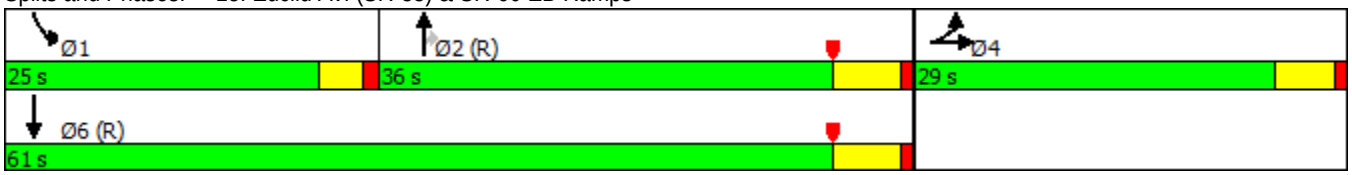
Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	324	0	880	554	287	1358
Future Volume (vph)	324	0	880	554	287	1358
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	32.2	32.2	19.3	55.5
Actuated g/C Ratio	0.27	0.27	0.36	0.36	0.21	0.62
v/c Ratio	0.76	0.97	0.77	0.65	0.88	0.69
Control Delay	44.0	64.6	31.2	5.9	51.4	5.7
Queue Delay	0.3	2.6	0.0	0.0	0.0	1.3
Total Delay	44.3	67.3	31.2	5.9	51.4	7.0
LOS	D	E	C	A	D	A
Approach Delay		57.7	21.4			14.7
Approach LOS		E	C			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 25.2 — Intersection LOS: C
Intersection Capacity Utilization 88.2% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	324	0	377	0	0	0	0	880	554	287	1358	0
Future Volume (veh/h)	324	0	377	0	0	0	0	880	554	287	1358	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	332	19	318				0	936	589	305	1445	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	391	21	351				0	1339	596	334	2196	0
Arrive On Green	0.24	0.24	0.24				0.00	0.39	0.39	0.27	0.85	0.00
Sat Flow, veh/h	1619	87	1456				0	3510	1522	1619	3510	0
Grp Volume(v), veh/h	332	0	337				0	936	589	305	1445	0
Grp Sat Flow(s),veh/h/ln	1619	0	1543				0	1710	1522	1619	1710	0
Q Serve(g_s), s	17.6	0.0	19.1				0.0	20.6	34.6	16.4	12.7	0.0
Cycle Q Clear(g_c), s	17.6	0.0	19.1				0.0	20.6	34.6	16.4	12.7	0.0
Prop In Lane	1.00		0.94				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	391	0	372				0	1339	596	334	2196	0
V/C Ratio(X)	0.85	0.00	0.91				0.00	0.70	0.99	0.91	0.66	0.00
Avail Cap(c_a), veh/h	432	0	411				0	1339	596	378	2196	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.84	0.84	0.34	0.34	0.00
Uniform Delay (d), s/veh	32.6	0.0	33.1				0.0	22.9	27.2	31.9	3.3	0.0
Incr Delay (d2), s/veh	12.6	0.0	20.7				0.0	2.6	31.0	10.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	0.0	10.3				0.0	10.2	19.5	8.2	5.7	0.0
LnGrp Delay(d),s/veh	45.2	0.0	53.9				0.0	25.5	58.1	41.9	3.8	0.0
LnGrp LOS	D		D					C	E	D	A	
Approach Vol, veh/h		669						1525			1750	
Approach Delay, s/veh		49.6						38.1			10.5	
Approach LOS		D						D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.5	40.7		26.7		63.3		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	18.4	36.6		21.1		14.7		
Green Ext Time (p_c), s	0.1	0.0		0.6		36.1		

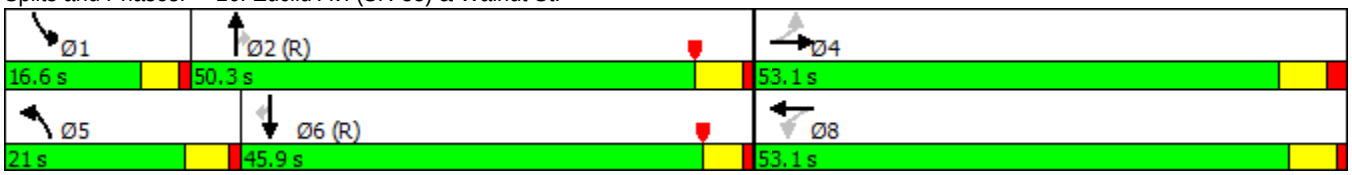
Intersection Summary	
HCM 2010 Ctrl Delay	27.8
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	147	326	90	301	102	1100	50	154	1310	56
Future Volume (vph)	147	326	90	301	102	1100	50	154	1310	56
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.0	33.0	34.0	34.0	12.7	60.4	60.4	10.5	58.5	58.5
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.11	0.50	0.50	0.09	0.49	0.49
v/c Ratio	0.97	0.48	0.50	0.50	0.63	0.47	0.07	0.63	0.58	0.08
Control Delay	106.9	33.2	42.5	28.1	64.1	14.1	5.8	64.0	25.7	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.9	33.2	42.5	28.1	64.1	14.1	5.8	64.0	25.7	4.7
LOS	F	C	D	C	E	B	A	E	C	A
Approach Delay		52.0		30.4		17.8			28.8	
Approach LOS		D		C		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 28.9	Intersection LOS: C
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	326	103	90	301	168	102	1100	50	154	1310	56
Future Volume (veh/h)	147	326	103	90	301	168	102	1100	50	154	1310	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	155	343	86	95	317	144	107	1158	34	162	1379	30
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	258	902	223	275	761	338	131	2275	708	210	2209	687
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.03	0.15	0.15	0.07	0.45	0.45
Sat Flow, veh/h	892	2718	673	920	2292	1017	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	155	214	215	95	235	226	107	1158	34	162	1379	30
Grp Sat Flow(s),veh/h/ln	892	1710	1681	920	1710	1600	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	19.6	11.5	11.8	10.6	12.7	13.2	7.9	26.0	2.3	6.5	25.8	1.3
Cycle Q Clear(g_c), s	32.9	11.5	11.8	22.3	12.7	13.2	7.9	26.0	2.3	6.5	25.8	1.3
Prop In Lane	1.00		0.40	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	568	558	275	568	531	131	2275	708	210	2209	687
V/C Ratio(X)	0.60	0.38	0.39	0.35	0.41	0.43	0.82	0.51	0.05	0.77	0.62	0.04
Avail Cap(c_a), veh/h	310	667	655	336	681	637	217	2275	708	298	2209	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.52	0.52	0.52	0.67	0.67	0.67
Uniform Delay (d), s/veh	44.0	30.6	30.7	39.3	31.0	31.2	57.5	38.3	28.3	54.8	25.3	18.5
Incr Delay (d2), s/veh	2.3	0.4	0.4	0.7	0.5	0.5	6.4	0.4	0.1	3.0	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	5.5	5.5	2.7	6.1	5.9	3.8	11.9	1.0	2.7	11.8	0.6
LnGrp Delay(d),s/veh	46.2	31.0	31.1	40.0	31.5	31.7	63.9	38.7	28.3	57.8	26.2	18.6
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	C	B
Approach Vol, veh/h		584			556			1299			1571	
Approach Delay, s/veh		35.1			33.1			40.5			29.3	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	60.9		46.1	14.6	59.3		46.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	8.5	28.0		34.9	9.9	27.8		24.3
Green Ext Time (p_c), s	0.1	12.7		5.0	0.1	10.6		6.7

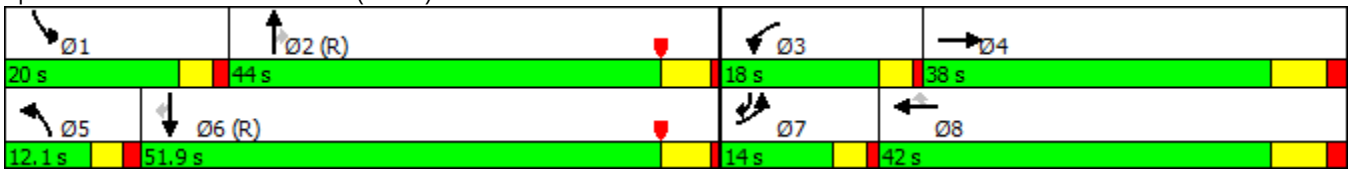
Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	318	180	373	49	62	963	167	175	1190	145
Future Volume (vph)	139	318	180	373	49	62	963	167	175	1190	145
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	38.0	18.0	42.0	42.0	12.1	44.0	44.0	20.0	51.9	14.0
Total Split (%)	11.7%	31.7%	15.0%	35.0%	35.0%	10.1%	36.7%	36.7%	16.7%	43.3%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.9	20.7	15.2	24.0	24.0	9.5	44.5	44.5	18.7	55.8	73.2
Actuated g/C Ratio	0.10	0.17	0.13	0.20	0.20	0.08	0.37	0.37	0.16	0.46	0.61
v/c Ratio	0.92	0.67	0.93	0.58	0.13	0.51	0.80	0.26	0.73	0.79	0.15
Control Delay	106.8	49.8	99.6	46.0	0.6	83.6	32.3	4.5	75.7	18.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.8	49.8	99.6	46.0	0.6	83.6	32.3	4.5	75.7	18.7	1.4
LOS	F	D	F	D	A	F	C	A	E	B	A
Approach Delay		65.2		58.3			31.1			23.7	
Approach LOS		E		E			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 37.0	Intersection LOS: D
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	318	56	180	373	49	62	963	167	175	1190	145
Future Volume (veh/h)	139	318	56	180	373	49	62	963	167	175	1190	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	146	335	36	189	393	47	65	1014	95	184	1253	87
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	522	56	189	688	307	81	1417	634	205	1678	878
Arrive On Green	0.08	0.17	0.17	0.12	0.20	0.20	0.07	0.55	0.55	0.25	0.98	0.98
Sat Flow, veh/h	1619	3113	332	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	146	183	188	189	393	47	65	1014	95	184	1253	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1735	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	10.0	12.0	12.1	14.0	12.4	3.0	4.8	26.4	3.6	13.2	3.0	0.1
Cycle Q Clear(g_c), s	10.0	12.0	12.1	14.0	12.4	3.0	4.8	26.4	3.6	13.2	3.0	0.1
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	287	291	189	688	307	81	1417	634	205	1678	878
V/C Ratio(X)	1.08	0.64	0.65	1.00	0.57	0.15	0.80	0.72	0.15	0.90	0.75	0.10
Avail Cap(c_a), veh/h	135	442	448	189	998	446	103	1417	634	209	1678	878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.84	0.84	0.84	0.80	0.80	0.80
Uniform Delay (d), s/veh	55.0	46.5	46.6	53.0	43.3	39.5	55.4	21.7	16.6	44.1	0.6	0.4
Incr Delay (d2), s/veh	101.2	3.3	3.4	65.6	1.1	0.3	25.5	2.6	0.4	30.4	2.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	5.9	6.1	9.7	6.0	1.3	2.7	12.9	1.6	7.5	1.2	0.1
LnGrp Delay(d),s/veh	156.2	49.9	50.0	118.6	44.3	39.8	80.9	24.3	17.0	74.5	3.1	0.6
LnGrp LOS	F	D	D	F	D	D	F	C	B	E	A	A
Approach Vol, veh/h		517			629			1174			1524	
Approach Delay, s/veh		79.9			66.3			26.9			11.5	
Approach LOS		E			E			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	55.2	18.0	27.1	10.5	64.4	14.0	31.1
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	38.5	14.0	31.0	7.6	46.4	10.0	35.0
Max Q Clear Time (g_c+I1), s	15.2	28.4	16.0	14.1	6.8	5.0	12.0	14.4
Green Ext Time (p_c), s	0.0	8.5	0.0	5.7	0.0	24.3	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	34.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	97	119	57	64	155	57	1036	132	28	1294	95
Future Volume (vph)	97	119	57	64	155	57	1036	132	28	1294	95
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	25.5	25.5	25.5		25.5	8.9	74.7	74.7	6.8	70.9	70.9
Actuated g/C Ratio	0.21	0.21	0.21		0.21	0.07	0.62	0.62	0.06	0.59	0.59
v/c Ratio	0.65	0.33	0.15		0.80	0.50	0.51	0.14	0.32	0.67	0.11
Control Delay	60.8	40.7	3.2		61.2	70.7	11.5	3.7	40.7	38.5	14.9
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	40.7	3.2		61.2	70.7	11.5	3.7	40.7	38.5	14.9
LOS	E	D	A		E	E	B	A	D	D	B
Approach Delay		40.0			61.2		13.4			37.0	
Approach LOS		D			E		B			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 30.1	Intersection LOS: C
Intersection Capacity Utilization 77.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	119	57	64	155	35	57	1036	132	28	1294	95
Future Volume (veh/h)	97	119	57	64	155	35	57	1036	132	28	1294	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	102	125	36	67	163	33	60	1091	103	29	1362	71
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	198	391	328	102	211	39	74	2119	948	42	2050	916
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.09	1.00	1.00	0.01	0.20	0.20
Sat Flow, veh/h	1139	1800	1510	295	970	182	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	102	125	36	263	0	0	60	1091	103	29	1362	71
Grp Sat Flow(s),veh/h/ln	1139	1800	1510	1447	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	0.5	7.0	2.3	14.4	0.0	0.0	4.4	0.0	0.0	2.1	44.1	4.5
Cycle Q Clear(g_c), s	21.9	7.0	2.3	21.4	0.0	0.0	4.4	0.0	0.0	2.1	44.1	4.5
Prop In Lane	1.00		1.00	0.25		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	391	328	352	0	0	74	2119	948	42	2050	916
V/C Ratio(X)	0.52	0.32	0.11	0.75	0.00	0.00	0.81	0.51	0.11	0.69	0.66	0.08
Avail Cap(c_a), veh/h	301	555	466	496	0	0	169	2119	948	101	2050	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.75	0.75	0.75	0.49	0.49	0.49
Uniform Delay (d), s/veh	45.6	39.5	37.7	45.6	0.0	0.0	54.0	0.0	0.0	59.0	37.0	21.1
Incr Delay (d2), s/veh	2.1	0.5	0.1	3.9	0.0	0.0	5.7	0.7	0.2	3.8	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.5	1.0	8.8	0.0	0.0	2.1	0.2	0.0	1.0	21.2	1.9
LnGrp Delay(d),s/veh	47.7	40.0	37.8	49.5	0.0	0.0	59.6	0.7	0.2	62.8	37.8	21.2
LnGrp LOS	D	D	D	D			E	A	A	E	D	C
Approach Vol, veh/h		263			263			1254			1462	
Approach Delay, s/veh		42.7			49.5			3.5			37.5	
Approach LOS		D			D			A			D	

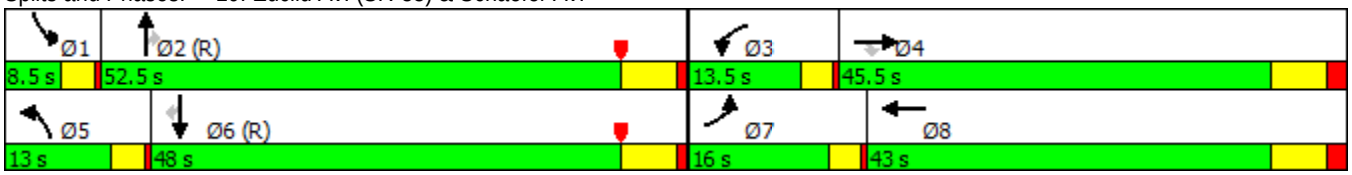
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	80.3		33.1	9.0	77.9		33.1
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.1	2.0		23.9	6.4	46.1		23.4
Green Ext Time (p_c), s	0.0	31.1		2.1	0.0	6.9		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	134	59	92	56	114	96	1099	19	14	1247	127
Future Volume (vph)	134	59	92	56	114	96	1099	19	14	1247	127
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.1	22.0	22.0	10.0	17.2	11.3	70.5	70.5	5.4	59.4	59.4
Actuated g/C Ratio	0.10	0.18	0.18	0.08	0.14	0.09	0.59	0.59	0.04	0.50	0.50
v/c Ratio	0.88	0.19	0.26	0.45	0.54	0.68	0.58	0.02	0.21	0.78	0.17
Control Delay	98.5	40.9	4.5	63.6	51.0	54.4	27.6	0.9	57.1	37.8	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.5	40.9	4.5	63.6	51.0	54.4	27.6	0.9	57.1	37.8	11.5
LOS	F	D	A	E	D	D	C	A	E	D	B
Approach Delay		56.3			54.8		29.3			35.6	
Approach LOS		E			D		C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 36.2	Intersection LOS: D
Intersection Capacity Utilization 75.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	59	92	56	114	17	96	1099	19	14	1247	127
Future Volume (veh/h)	134	59	92	56	114	17	96	1099	19	14	1247	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	143	63	46	60	121	16	102	1169	15	15	1327	87
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	166	235	199	117	155	21	124	2102	940	27	1896	829
Arrive On Green	0.10	0.13	0.13	0.07	0.10	0.10	0.05	0.41	0.41	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1558	206	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	143	63	46	60	0	137	102	1169	15	15	1327	87
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	10.4	3.8	3.2	4.3	0.0	9.1	7.5	31.3	0.7	1.1	43.6	5.8
Cycle Q Clear(g_c), s	10.4	3.8	3.2	4.3	0.0	9.1	7.5	31.3	0.7	1.1	43.6	5.8
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	166	235	199	117	0	176	124	2102	940	27	1896	829
V/C Ratio(X)	0.86	0.27	0.23	0.51	0.00	0.78	0.82	0.56	0.02	0.57	0.70	0.10
Avail Cap(c_a), veh/h	169	578	491	135	0	529	128	2102	940	67	1896	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.65	0.65	0.65	0.71	0.71	0.71
Uniform Delay (d), s/veh	53.0	47.0	46.8	53.7	0.0	52.7	56.1	22.8	13.8	59.2	39.7	24.2
Incr Delay (d2), s/veh	31.8	0.5	0.4	1.3	0.0	5.5	21.7	0.7	0.0	4.9	1.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	1.9	1.4	2.0	0.0	4.7	4.1	15.0	0.3	0.5	21.1	2.5
LnGrp Delay(d),s/veh	84.8	47.5	47.2	55.0	0.0	58.2	77.9	23.5	13.8	64.1	41.2	24.4
LnGrp LOS	F	D	D	D		E	E	C	B	E	D	C
Approach Vol, veh/h		252			197			1286			1429	
Approach Delay, s/veh		68.6			57.2			27.7			40.4	
Approach LOS		E			E			C			D	

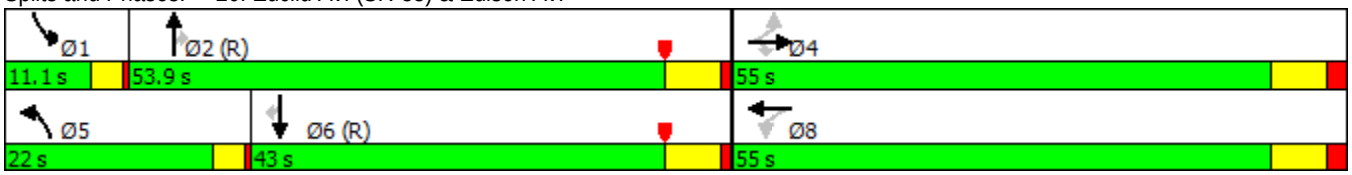
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	79.7	12.1	22.6	12.7	72.5	15.8	19.0
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.1	33.3	6.3	5.8	9.5	45.6	12.4	11.1
Green Ext Time (p_c), s	0.0	11.0	0.0	0.9	0.0	0.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	38.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	206	158	176	66	328	188	938	34	39	1078	237
Future Volume (vph)	206	158	176	66	328	188	938	34	39	1078	237
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.0	43.0	43.0	43.0	43.0	17.1	55.4	55.4	6.7	43.3	43.3
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.14	0.46	0.46	0.06	0.36	0.36
v/c Ratio	1.01	0.26	0.28	0.18	0.61	0.87	0.63	0.05	0.46	0.93	0.39
Control Delay	101.8	27.1	4.4	25.6	34.7	69.6	35.9	7.1	90.7	30.3	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.8	27.1	4.4	25.6	34.7	69.6	35.9	7.1	90.7	30.3	4.2
LOS	F	C	A	C	C	E	D	A	F	C	A
Approach Delay		48.2			33.3		40.5			27.4	
Approach LOS		D			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 35.7	Intersection LOS: D
Intersection Capacity Utilization 97.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	158	176	66	328	38	188	938	34	39	1078	237
Future Volume (veh/h)	206	158	176	66	328	38	188	938	34	39	1078	237
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	219	168	120	70	349	38	200	998	21	41	1147	221
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	282	720	612	414	638	69	224	1475	660	50	1109	495
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.14	0.43	0.43	0.06	0.65	0.65
Sat Flow, veh/h	956	1800	1530	1047	1595	174	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	219	168	120	70	0	387	200	998	21	41	1147	221
Grp Sat Flow(s),veh/h/ln	956	1800	1530	1047	0	1769	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	27.4	7.4	6.1	5.7	0.0	20.2	14.6	28.1	0.9	3.0	38.9	8.6
Cycle Q Clear(g_c), s	47.6	7.4	6.1	13.1	0.0	20.2	14.6	28.1	0.9	3.0	38.9	8.6
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	282	720	612	414	0	708	224	1475	660	50	1109	495
V/C Ratio(X)	0.78	0.23	0.20	0.17	0.00	0.55	0.89	0.68	0.03	0.81	1.03	0.45
Avail Cap(c_a), veh/h	282	720	612	414	0	708	250	1475	660	103	1109	495
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.89	0.89	0.89	0.60	0.60	0.60
Uniform Delay (d), s/veh	45.9	23.8	23.4	28.2	0.0	27.6	50.8	27.4	19.7	55.9	21.1	15.8
Incr Delay (d2), s/veh	12.9	0.2	0.2	0.2	0.0	0.9	25.0	2.2	0.1	7.0	30.5	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	3.7	2.6	1.7	0.0	10.0	8.1	13.8	0.4	1.4	22.5	3.8
LnGrp Delay(d),s/veh	58.8	24.0	23.6	28.3	0.0	28.5	75.8	29.6	19.7	62.9	51.6	17.5
LnGrp LOS	E	C	C	C		C	E	C	B	E	F	B
Approach Vol, veh/h		507			457			1219			1409	
Approach Delay, s/veh		38.9			28.5			37.0			46.6	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	57.8		55.0	20.1	44.9		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.0	30.1		49.6	16.6	40.9		22.2
Green Ext Time (p_c), s	0.0	12.9		0.0	0.1	0.0		5.2

Intersection Summary			
HCM 2010 Ctrl Delay		40.0	
HCM 2010 LOS		D	

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	52	7	152	21	43	133	1087	6	21	1266	26
Future Volume (vph)	52	7	152	21	43	133	1087	6	21	1266	26
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	21.0	63.5	63.5	9.7	52.2	52.2
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	17.5%	52.9%	52.9%	8.1%	43.5%	43.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.6	15.6	15.6	15.6	15.6	14.3	87.7	87.7	6.2	76.1	76.1
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.12	0.73	0.73	0.05	0.63	0.63
v/c Ratio	0.35	0.03	0.47	0.13	0.31	0.72	0.45	0.01	0.27	0.61	0.03
Control Delay	48.6	36.7	9.9	41.2	28.9	79.9	5.6	0.2	78.5	9.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	36.7	9.9	41.2	28.9	79.9	5.6	0.2	78.5	9.4	1.1
LOS	D	D	A	D	C	E	A	A	E	A	A
Approach Delay		20.3			31.7		13.6			10.4	
Approach LOS		C			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	7	152	21	43	30	133	1087	6	21	1266	26
Future Volume (veh/h)	52	7	152	21	43	30	133	1087	6	21	1266	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	7	72	22	45	24	139	1132	6	22	1319	23
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	141	182	155	184	112	60	163	2600	1163	35	2329	1019
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.76	0.76	0.01	0.22	0.22
Sat Flow, veh/h	1278	1800	1530	1266	1106	590	1619	3420	1530	1619	3420	1497
Grp Volume(v), veh/h	54	7	72	22	0	69	139	1132	6	22	1319	23
Grp Sat Flow(s),veh/h/ln	1278	1800	1530	1266	0	1696	1619	1710	1530	1619	1710	1497
Q Serve(g_s), s	5.0	0.4	5.3	1.9	0.0	4.6	10.1	14.2	0.1	1.6	41.1	1.4
Cycle Q Clear(g_c), s	9.5	0.4	5.3	2.3	0.0	4.6	10.1	14.2	0.1	1.6	41.1	1.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	182	155	184	0	172	163	2600	1163	35	2329	1019
V/C Ratio(X)	0.38	0.04	0.46	0.12	0.00	0.40	0.85	0.44	0.01	0.63	0.57	0.02
Avail Cap(c_a), veh/h	459	630	535	499	0	594	236	2600	1163	84	2329	1019
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.49	0.49	0.49
Uniform Delay (d), s/veh	55.0	48.6	50.8	49.7	0.0	50.5	53.1	5.2	3.5	59.1	30.8	15.4
Incr Delay (d2), s/veh	1.3	0.1	1.6	0.2	0.0	1.1	15.7	0.5	0.0	6.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.2	2.3	0.7	0.0	2.2	5.2	6.8	0.0	0.8	19.7	0.6
LnGrp Delay(d),s/veh	56.2	48.7	52.5	49.9	0.0	51.6	68.8	5.7	3.5	65.6	31.3	15.4
LnGrp LOS	E	D	D	D		D	E	A	A	E	C	B
Approach Vol, veh/h		133			91			1277			1364	
Approach Delay, s/veh		53.8			51.2			12.5			31.6	
Approach LOS		D			D			B			C	

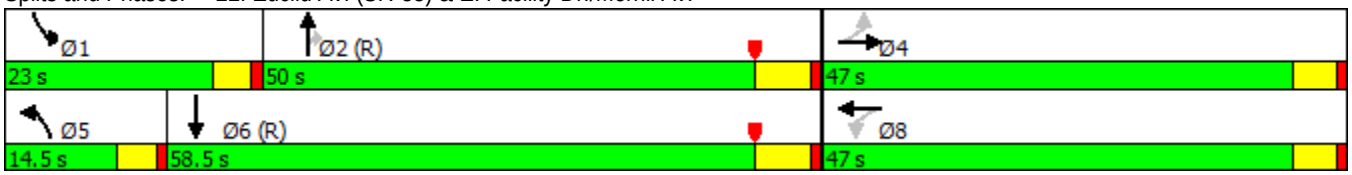
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	96.9		17.0	15.6	87.4		17.0
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	57.8		42.0	17.5	46.5		42.0
Max Q Clear Time (g_c+I1), s	3.6	16.2		11.5	12.1	43.1		6.6
Green Ext Time (p_c), s	0.0	25.1		0.6	0.1	3.1		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	162	46	19	1018	105	165	1267
Future Volume (vph)	8	6	162	46	19	1018	105	165	1267
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		35.8		35.8	10.0	52.7	52.7	15.9	67.4
Actuated g/C Ratio		0.30		0.30	0.08	0.44	0.44	0.13	0.56
v/c Ratio		0.04		0.91	0.15	0.71	0.15	0.80	0.71
Control Delay		22.6		60.2	55.3	22.9	2.9	69.7	19.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.6		60.2	55.3	22.9	2.9	69.7	19.6
LOS		C		E	E	C	A	E	B
Approach Delay		22.6		60.2		21.7			25.2
Approach LOS		C		E		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 89.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	162	46	191	19	1018	105	165	1267	42
Future Volume (veh/h)	8	6	4	162	46	191	19	1018	105	165	1267	42
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	169	48	153	20	1060	83	172	1320	41
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	182	131	58	223	55	166	66	1655	740	196	1912	59
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.04	0.48	0.48	0.12	0.56	0.56
Sat Flow, veh/h	521	492	217	677	207	623	1619	3420	1530	1619	3386	105
Grp Volume(v), veh/h	17	0	0	370	0	0	20	1060	83	172	666	695
Grp Sat Flow(s),veh/h/ln	1230	0	0	1507	0	0	1619	1710	1530	1619	1710	1781
Q Serve(g_s), s	0.0	0.0	0.0	27.8	0.0	0.0	1.4	27.8	3.6	12.5	33.3	33.4
Cycle Q Clear(g_c), s	0.9	0.0	0.0	28.7	0.0	0.0	1.4	27.8	3.6	12.5	33.3	33.4
Prop In Lane	0.47		0.18	0.46		0.41	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	371	0	0	444	0	0	66	1655	740	196	966	1006
V/C Ratio(X)	0.05	0.00	0.00	0.83	0.00	0.00	0.30	0.64	0.11	0.88	0.69	0.69
Avail Cap(c_a), veh/h	491	0	0	571	0	0	135	1655	740	250	966	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.49	0.49	0.49	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	0.0	42.8	0.0	0.0	55.9	23.2	16.9	51.8	18.6	18.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	6.6	0.0	0.0	0.5	1.0	0.2	20.3	4.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	12.7	0.0	0.0	0.7	13.3	1.5	6.7	16.8	17.5
LnGrp Delay(d),s/veh	32.7	0.0	0.0	49.4	0.0	0.0	56.4	24.1	17.0	72.1	22.6	22.5
LnGrp LOS	C			D			E	C	B	E	C	C
Approach Vol, veh/h		17			370			1163			1533	
Approach Delay, s/veh		32.7			49.4			24.2			28.1	
Approach LOS		C			D			C			C	

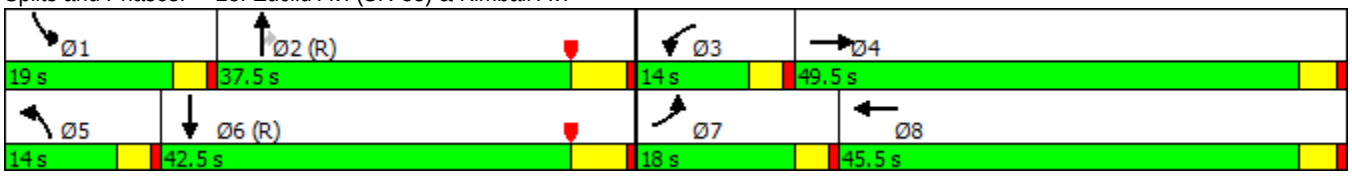
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.1	64.1		36.9	9.4	73.8		36.9
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	14.5	29.8		2.9	3.4	35.4		30.7
Green Ext Time (p_c), s	0.1	11.2		1.4	0.0	13.0		1.1

Intersection Summary		
HCM 2010 Ctrl Delay		29.2
HCM 2010 LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	135	399	36	664	97	653	63	445	603
Future Volume (vph)	135	399	36	664	97	653	63	445	603
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	12.9	46.8	10.0	38.3	10.3	29.1	29.1	21.2	40.0
Actuated g/C Ratio	0.11	0.39	0.08	0.32	0.09	0.24	0.24	0.18	0.33
v/c Ratio	0.80	0.33	0.28	0.91	0.72	0.80	0.14	1.59	0.82
Control Delay	82.9	26.4	57.3	49.4	64.9	48.1	6.6	310.9	29.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.9	26.4	57.3	49.4	64.9	48.1	6.6	310.9	29.2
LOS	F	C	E	D	E	D	A	F	C
Approach Delay		40.0		49.7		46.9			121.6
Approach LOS		D		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.59	
Intersection Signal Delay: 73.7	Intersection LOS: E
Intersection Capacity Utilization 100.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	399	25	36	664	308	97	653	63	445	603	310
Future Volume (veh/h)	135	399	25	36	664	308	97	653	63	445	603	310
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	138	407	24	37	678	292	99	666	56	454	615	278
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	1184	70	96	745	321	130	1030	461	202	789	356
Arrive On Green	0.10	0.36	0.36	0.06	0.32	0.32	0.03	0.10	0.10	0.13	0.35	0.35
Sat Flow, veh/h	1619	3283	193	1619	2330	1003	1619	3420	1530	1619	2282	1031
Grp Volume(v), veh/h	138	211	220	37	498	472	99	666	56	454	461	432
Grp Sat Flow(s),veh/h/ln	1619	1710	1766	1619	1710	1623	1619	1710	1530	1619	1710	1603
Q Serve(g_s), s	10.1	10.8	10.9	2.6	33.5	33.5	7.3	22.5	4.0	15.0	29.0	29.0
Cycle Q Clear(g_c), s	10.1	10.8	10.9	2.6	33.5	33.5	7.3	22.5	4.0	15.0	29.0	29.0
Prop In Lane	1.00		0.11	1.00		0.62	1.00		1.00	1.00		0.64
Lane Grp Cap(c), veh/h	162	617	637	96	547	519	130	1030	461	202	591	554
V/C Ratio(X)	0.85	0.34	0.34	0.39	0.91	0.91	0.76	0.65	0.12	2.24	0.78	0.78
Avail Cap(c_a), veh/h	189	641	662	135	584	555	135	1030	461	202	591	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	0.78	0.78	0.78	0.63	0.63	0.63
Uniform Delay (d), s/veh	53.2	28.0	28.0	54.4	39.1	39.1	57.3	47.9	39.6	52.5	35.1	35.2
Incr Delay (d2), s/veh	22.3	0.3	0.3	1.0	17.0	17.7	15.4	2.5	0.4	569.4	6.4	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	5.2	5.4	1.2	18.3	17.5	3.8	11.0	1.8	38.7	14.7	13.9
LnGrp Delay(d),s/veh	75.5	28.3	28.3	55.3	56.1	56.8	72.7	50.4	40.0	621.9	41.5	42.0
LnGrp LOS	E	C	C	E	E	E	E	D	D	F	D	D
Approach Vol, veh/h		569			1007			821			1347	
Approach Delay, s/veh		39.7			56.4			52.3			237.3	
Approach LOS		D			E			D			F	

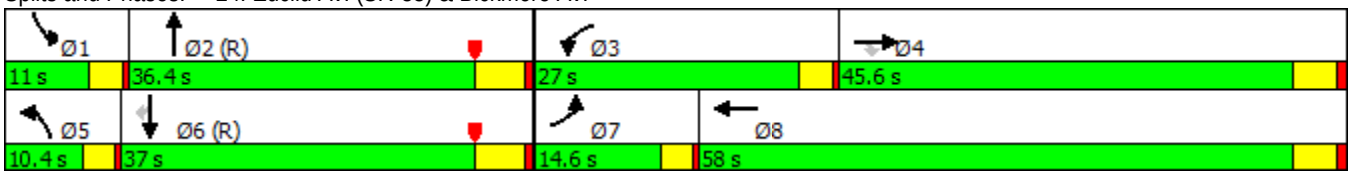
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	42.1	11.1	47.8	13.6	47.5	16.0	42.9
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	24.5	4.6	12.9	9.3	31.0	12.1	35.5
Green Ext Time (p_c), s	0.0	4.6	0.0	6.6	0.0	3.8	0.0	2.9

Intersection Summary	
HCM 2010 Ctrl Delay	118.1
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	65	18	24	204	365	29	549	51	508	74
Future Volume (vph)	65	18	24	204	365	29	549	51	508	74
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	8.9	24.3	24.3	30.9	44.0	6.4	45.4	7.6	48.4	48.4
Actuated g/C Ratio	0.07	0.20	0.20	0.26	0.37	0.05	0.38	0.06	0.40	0.40
v/c Ratio	0.57	0.05	0.07	0.52	0.89	0.36	0.59	0.53	0.39	0.12
Control Delay	71.9	30.3	0.3	46.3	49.9	36.5	22.4	69.0	13.0	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	30.3	0.3	46.3	49.9	36.5	22.4	69.0	13.0	4.3
LOS	E	C	A	D	D	D	C	E	B	A
Approach Delay		48.6			48.9		23.0		16.5	
Approach LOS		D			D		C		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 31.0	Intersection LOS: C
Intersection Capacity Utilization 76.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	18	24	204	365	172	29	549	153	51	508	74
Future Volume (veh/h)	65	18	24	204	365	172	29	549	153	51	508	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	69	19	24	217	388	170	31	584	162	54	540	70
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	86	455	386	242	415	182	43	1086	301	68	1454	651
Arrive On Green	0.05	0.25	0.25	0.15	0.35	0.35	0.01	0.14	0.14	0.01	0.14	0.14
Sat Flow, veh/h	1619	1800	1528	1619	1188	520	1619	2648	733	1619	3420	1530
Grp Volume(v), veh/h	69	19	24	217	0	558	31	377	369	54	540	70
Grp Sat Flow(s),veh/h/ln	1619	1800	1528	1619	0	1708	1619	1710	1671	1619	1710	1530
Q Serve(g_s), s	5.1	1.0	1.4	15.8	0.0	37.9	2.3	24.6	24.7	4.0	17.2	4.8
Cycle Q Clear(g_c), s	5.1	1.0	1.4	15.8	0.0	37.9	2.3	24.6	24.7	4.0	17.2	4.8
Prop In Lane	1.00		1.00	1.00		0.30	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	86	455	386	242	0	596	43	702	685	68	1454	651
V/C Ratio(X)	0.80	0.04	0.06	0.90	0.00	0.94	0.71	0.54	0.54	0.80	0.37	0.11
Avail Cap(c_a), veh/h	150	609	517	317	0	754	93	702	685	101	1454	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.58	0.58	0.58	0.49	0.49	0.49
Uniform Delay (d), s/veh	56.2	33.9	34.0	50.1	0.0	37.8	59.0	41.2	41.3	58.7	37.0	31.7
Incr Delay (d2), s/veh	6.4	0.0	0.0	19.2	0.0	15.1	4.7	1.7	1.8	6.9	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.5	0.6	8.3	0.0	20.3	1.1	12.0	11.8	1.9	8.2	2.1
LnGrp Delay(d),s/veh	62.6	33.9	34.1	69.3	0.0	52.8	63.7	43.0	43.1	65.6	37.4	31.9
LnGrp LOS	E	C	C	E		D	E	D	D	E	D	C
Approach Vol, veh/h		112			775			777			664	
Approach Delay, s/veh		51.6			57.4			43.8			39.1	
Approach LOS		D			E			D			D	

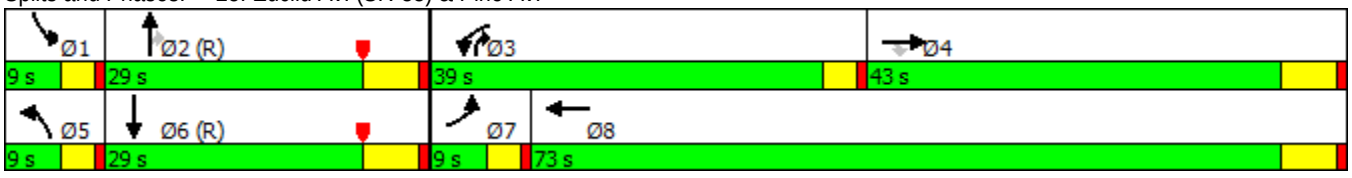
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	54.7	21.4	35.3	6.7	56.5	9.9	46.9
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	6.0	26.7	17.8	3.4	4.3	19.2	7.1	39.9
Green Ext Time (p_c), s	0.0	2.0	0.1	2.4	0.0	3.9	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	47.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	208	32	841	159	56	706	470	64	651
Future Volume (vph)	5	208	32	841	159	56	706	470	64	651
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	22.3	22.3	35.0	59.5	8.2	33.3	70.3	9.4	34.5
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.28	0.59	0.08	0.29
v/c Ratio	0.07	0.63	0.08	0.99	0.30	0.52	0.75	0.45	0.52	0.69
Control Delay	57.8	52.2	0.4	70.3	15.1	71.8	48.3	2.2	59.1	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.2	0.4	70.3	15.1	71.8	48.3	2.2	59.1	34.1
LOS	E	D	A	E	B	E	D	A	E	C
Approach Delay		45.6			57.5		31.7			36.3
Approach LOS		D			E		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 42.3	Intersection LOS: D
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	208	32	841	159	96	56	706	470	64	651	14
Future Volume (veh/h)	5	208	32	841	159	96	56	706	470	64	651	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	210	0	849	161	82	57	713	297	65	658	9
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	282	240	862	495	252	67	1174	960	67	1186	16
Arrive On Green	0.01	0.16	0.00	0.29	0.44	0.44	0.04	0.34	0.34	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1120	571	1619	3420	1496	1619	3453	47
Grp Volume(v), veh/h	5	210	0	849	0	243	57	713	297	65	326	341
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1691	1619	1710	1496	1619	1710	1790
Q Serve(g_s), s	0.4	13.4	0.0	34.2	0.0	11.2	4.2	20.8	10.8	4.8	21.6	21.6
Cycle Q Clear(g_c), s	0.4	13.4	0.0	34.2	0.0	11.2	4.2	20.8	10.8	4.8	21.6	21.6
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	282	240	862	0	747	67	1174	960	67	587	615
V/C Ratio(X)	0.48	0.74	0.00	0.98	0.00	0.33	0.84	0.61	0.31	0.96	0.55	0.56
Avail Cap(c_a), veh/h	67	555	472	862	0	944	67	1174	960	67	587	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	0.91	0.91	0.91
Uniform Delay (d), s/veh	59.4	48.3	0.0	42.2	0.0	21.8	57.1	32.7	10.0	59.1	44.5	44.5
Incr Delay (d2), s/veh	12.4	5.5	0.0	26.7	0.0	0.4	40.3	1.4	0.5	91.4	3.4	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.1	0.0	17.1	0.0	5.3	2.6	10.0	4.6	3.9	10.8	11.3
LnGrp Delay(d),s/veh	71.8	53.8	0.0	69.0	0.0	22.2	97.4	34.1	10.5	150.5	47.9	47.8
LnGrp LOS	E	D		E		C	F	C	B	F	D	D
Approach Vol, veh/h		215			1092			1067			732	
Approach Delay, s/veh		54.2			58.6			30.9			57.0	
Approach LOS		D			E			C			E	

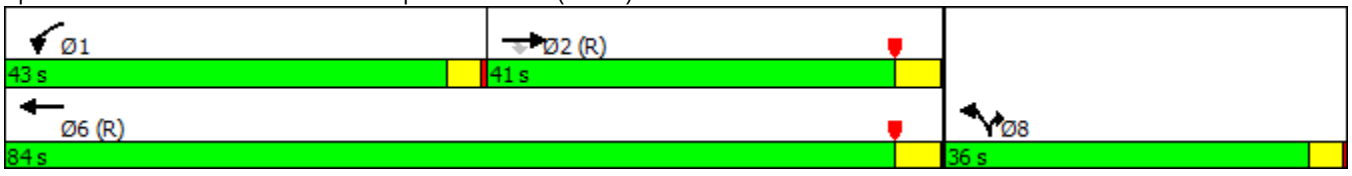
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	47.2	39.0	24.8	9.0	47.2	4.8	59.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	6.8	22.8	36.2	15.4	6.2	23.6	2.4	13.2
Green Ext Time (p_c), s	0.0	0.2	0.0	3.4	0.0	0.0	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	48.4
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	494	289	552	962	69	770
Future Volume (vph)	494	289	552	962	69	770
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	41.0	41.0	43.0	84.0	36.0	36.0
Total Split (%)	34.2%	34.2%	35.8%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	39.1	39.1	42.4	85.0	27.0	27.0
Actuated g/C Ratio	0.33	0.33	0.35	0.71	0.22	0.22
v/c Ratio	0.46	0.43	0.95	0.41	0.10	0.97
Control Delay	56.3	25.3	59.9	0.5	34.4	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	25.3	59.9	0.5	34.4	35.2
LOS	E	C	E	A	C	D
Approach Delay	44.9			22.2	35.2	
Approach LOS	D			C	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	494	289	552	962	69	770
Future Volume (veh/h)	494	289	552	962	69	770
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	515	0	575	1002	72	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1824	816	564	3050	139	64
Arrive On Green	1.00	0.00	0.33	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	515	0	575	1002	72	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	39.5	5.4	2.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	39.5	5.4	2.5	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1824	816	564	3050	139	64
V/C Ratio(X)	0.28	0.00	1.02	0.33	0.52	0.00
Avail Cap(c_a), veh/h	1824	816	564	3050	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.43	0.43	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	40.3	1.0	56.3	0.0
Incr Delay (d2), s/veh	0.4	0.0	29.8	0.1	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	23.3	2.4	1.2	0.0
LnGrp Delay(d),s/veh	0.4	0.0	70.1	1.1	59.3	0.0
LnGrp LOS	A		F	A	E	
Approach Vol, veh/h	515			1577	72	
Approach Delay, s/veh	0.4			26.3	59.3	
Approach LOS	A			C	E	

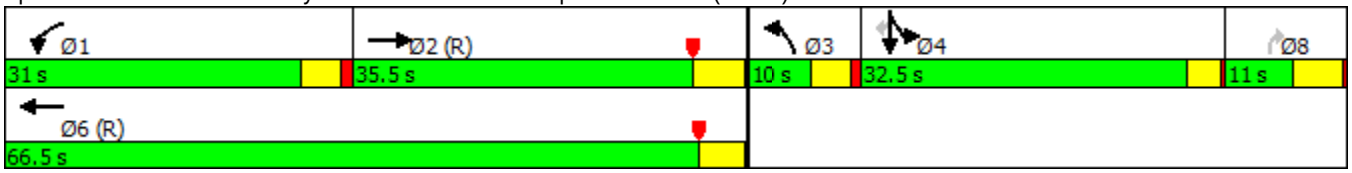
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	43.0	68.5				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	39.5	36.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	41.5	2.0				7.4		4.5
Green Ext Time (p_c), s	0.0	9.9				10.8		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	21.2
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	753	381	206	60	288	256	20	35
Future Volume (vph)	753	381	206	60	288	256	20	35
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	35.5	31.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	29.6%	25.8%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	30.5	36.2	71.7	5.5	7.1	18.2	18.2	18.2
Actuated g/C Ratio	0.25	0.30	0.60	0.05	0.06	0.15	0.15	0.15
v/c Ratio	0.97	0.86	0.11	0.89	0.82	0.66	0.61	0.11
Control Delay	69.3	65.4	4.1	134.9	23.4	60.1	56.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	65.4	4.1	134.9	23.4	60.1	56.7	0.6
LOS	E	E	A	F	C	E	E	A
Approach Delay	69.3		43.9				51.9	
Approach LOS	E		D				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 54.6	Intersection LOS: D
Intersection Capacity Utilization 72.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	753	16	381	206	0	60	0	288	256	20	35
Future Volume (veh/h)	0	753	16	381	206	0	60	0	288	256	20	35
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	827	18	419	226	0	66	0	316	297	0	38
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1905	41	358	2787	0	0	0	0	370	0	175
Arrive On Green	0.00	0.56	0.56	0.37	1.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11
Sat Flow, veh/h	0	3512	74	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	413	432	419	226	0		0.0		297	0	38
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	17.0	17.0	26.5	0.0	0.0				10.7	0.0	2.7
Cycle Q Clear(g_c), s	0.0	17.0	17.0	26.5	0.0	0.0				10.7	0.0	2.7
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	952	994	358	2787	0				370	0	175
V/C Ratio(X)	0.00	0.43	0.43	1.17	0.08	0.00				0.80	0.00	0.22
Avail Cap(c_a), veh/h	0	952	994	358	2787	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.6	15.6	37.9	0.0	0.0				51.8	0.0	48.3
Incr Delay (d2), s/veh	0.0	1.4	1.4	103.1	0.1	0.0				4.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.3	8.7	22.0	0.0	0.0				5.0	0.0	1.2
LnGrp Delay(d),s/veh	0.0	17.0	16.9	141.0	0.1	0.0				55.9	0.0	48.9
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		845			645						335	
Approach Delay, s/veh		17.0			91.6						55.1	
Approach LOS		B			F						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	31.0	71.8		17.2		102.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	26.5	30.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	28.5	19.0		12.7		2.0		
Green Ext Time (p_c), s	0.0	3.3		1.0		4.4		

Intersection Summary	
HCM 2010 Ctrl Delay	50.3
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	222	734	6	0	5
Future Vol, veh/h	0	222	734	6	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	241	798	7	0	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	801
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	388
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	388
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	388
HCM Lane V/C Ratio	-	-	-	0.014
HCM Control Delay (s)	-	-	-	14.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	222	736	5	0	4
Future Vol, veh/h	0	222	736	5	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	241	800	5	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	803
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	387
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	387
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	387
HCM Lane V/C Ratio	-	-	-	0.011
HCM Control Delay (s)	-	-	-	14.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	709	215	16	1080	41	3
Future Volume (vph)	709	215	16	1080	41	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.2	24.2	9.6	24.2	32.1	32.1
Total Split (s)	58.3	58.3	9.6	67.9	32.1	32.1
Total Split (%)	58.3%	58.3%	9.6%	67.9%	32.1%	32.1%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	60.4	60.4	5.0	62.0	13.0	13.0
Actuated g/C Ratio	0.70	0.70	0.06	0.72	0.15	0.15
v/c Ratio	0.61	0.21	0.18	0.91	0.19	0.01
Control Delay	12.3	1.8	46.0	23.6	32.8	19.3
Queue Delay	0.0	0.0	0.0	2.1	0.0	0.0
Total Delay	12.3	1.8	46.0	25.7	32.8	19.3
LOS	B	A	D	C	C	B
Approach Delay	9.9			26.0	32.0	
Approach LOS	A			C	C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 86.4	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	709	215	16	1080	41	3
Future Volume (veh/h)	709	215	16	1080	41	3
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	771	234	17	1174	45	3
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1164	989	32	1306	209	197
Arrive On Green	0.65	0.65	0.02	0.73	0.13	0.13
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	771	234	17	1174	45	3
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	20.6	5.0	0.8	39.9	1.9	0.1
Cycle Q Clear(g_c), s	20.6	5.0	0.8	39.9	1.9	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1164	989	32	1306	209	197
V/C Ratio(X)	0.66	0.24	0.53	0.90	0.22	0.02
Avail Cap(c_a), veh/h	1208	1027	104	1431	563	532
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.5	5.7	37.7	8.4	30.3	29.5
Incr Delay (d2), s/veh	1.3	0.1	5.0	7.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	2.1	0.4	22.0	0.9	0.1
LnGrp Delay(d),s/veh	9.8	5.8	42.7	16.0	30.8	29.5
LnGrp LOS	A	A	D	B	C	C
Approach Vol, veh/h	1005			1191	48	
Approach Delay, s/veh	8.9			16.3	30.7	
Approach LOS	A			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.1	56.4				62.5		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	52.1				61.7		27.0
Max Q Clear Time (g_c+I1), s	2.8	22.6				41.9		3.9
Green Ext Time (p_c), s	0.0	19.1				14.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	44	220	11
Future Vol, veh/h	0	4	0	44	220	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	4	0	48	239	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	245	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	799	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	799	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	799	-	-
HCM Lane V/C Ratio	-	0.005	-	-
HCM Control Delay (s)	-	9.5	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	12	33	5	61	164
Future Vol, veh/h	1	12	33	5	61	164
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	13	36	5	66	178

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	350	39	0	0	41	0
Stage 1	39	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	651	1038	-	-	1581	-
Stage 1	989	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	621	1038	-	-	1581	-
Mov Cap-2 Maneuver	635	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	714	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	990	1581	-
HCM Lane V/C Ratio	-	-	0.014	0.042	-
HCM Control Delay (s)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	4	35	5	18	146
Future Vol, veh/h	1	4	35	5	18	146
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	4	38	5	20	159

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	239	41	0	0	43	0
Stage 1	41	-	-	-	-	-
Stage 2	198	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	754	1036	-	-	1579	-
Stage 1	987	-	-	-	-	-
Stage 2	840	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	743	1036	-	-	1579	-
Mov Cap-2 Maneuver	736	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	828	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	958	1579	-
HCM Lane V/C Ratio	-	-	0.006	0.012	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	2	11	39	142	5
Future Vol, veh/h	1	2	11	39	142	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	2	12	42	154	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	223	157	160	0	-	0
Stage 1	157	-	-	-	-	-
Stage 2	66	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	770	894	1432	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	763	894	1432	-	-	-
Mov Cap-2 Maneuver	761	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	953	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1432	-	845	-	-
HCM Lane V/C Ratio	0.008	-	0.004	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	49	6	5	139
Future Vol, veh/h	1	1	49	6	5	139
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	1	53	7	5	151

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	219	57	0	0	60	0
Stage 1	57	-	-	-	-	-
Stage 2	162	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	774	1015	-	-	1556	-
Stage 1	971	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	771	1015	-	-	1556	-
Mov Cap-2 Maneuver	764	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	869	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	872	1556	-
HCM Lane V/C Ratio	-	-	0.002	0.003	-
HCM Control Delay (s)	-	-	9.1	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	2	32	48	108	31
Future Vol, veh/h	6	2	32	48	108	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	2	35	52	117	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	256	134	151	0	-	0
Stage 1	134	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	701	920	1442	-	-	-
Stage 1	874	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	688	920	1442	-	-	-
Mov Cap-2 Maneuver	706	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	865	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1442	-	750	-	-
HCM Lane V/C Ratio	0.024	-	0.012	-	-
HCM Control Delay (s)	7.6	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	2	11	73	84	26
Future Vol, veh/h	7	2	11	73	84	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	2	12	79	91	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	208	105	120	0	-	0
Stage 1	105	-	-	-	-	-
Stage 2	103	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	785	955	1480	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	779	955	1480	-	-	-
Mov Cap-2 Maneuver	776	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1480	-	810	-	-
HCM Lane V/C Ratio	0.008	-	0.012	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	2	11	78	54	33
Future Vol, veh/h	6	2	11	78	54	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	2	12	85	59	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	186	77	95	0	-	0
Stage 1	77	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	808	990	1512	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	802	990	1512	-	-	-
Mov Cap-2 Maneuver	790	-	-	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1512	-	832	-	-
HCM Lane V/C Ratio	0.008	-	0.01	-	-
HCM Control Delay (s)	7.4	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	8	87	45	11
Future Vol, veh/h	2	2	8	87	45	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	2	9	95	49	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	167	55	61	0	-	0
Stage 1	55	-	-	-	-	-
Stage 2	112	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	828	1018	1555	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	918	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	823	1018	1555	-	-	-
Mov Cap-2 Maneuver	802	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1555	-	897	-	-
HCM Lane V/C Ratio	0.006	-	0.005	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	7	54	91	28	18
Future Vol, veh/h	4	7	54	91	28	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	8	59	99	30	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	256	40	50	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	737	1037	1570	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	708	1037	1570	-	-	-
Mov Cap-2 Maneuver	705	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	792	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1570	-	885	-	-
HCM Lane V/C Ratio	0.037	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	33	142	24	11
Future Vol, veh/h	2	2	33	142	24	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	2	36	154	26	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	258	32	38	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	735	1048	1585	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	816	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	717	1048	1585	-	-	-
Mov Cap-2 Maneuver	711	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	796	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1585	-	847	-	-
HCM Lane V/C Ratio	0.023	-	0.005	-	-
HCM Control Delay (s)	7.3	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	154	68	721	22	6	20
Future Vol, veh/h	154	68	721	22	6	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	167	74	784	24	7	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	784	0	-	0	1193	784
Stage 1	-	-	-	-	784	-
Stage 2	-	-	-	-	409	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	843	-	-	-	208	396
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	675	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	843	-	-	-	167	396
Mov Cap-2 Maneuver	-	-	-	-	362	-
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	541	-

Approach	EB	WB	SB
HCM Control Delay, s	7.2	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	843	-	-	-	362	396
HCM Lane V/C Ratio	0.199	-	-	-	0.018	0.055
HCM Control Delay (s)	10.3	-	-	-	15.1	14.6
HCM Lane LOS	B	-	-	-	C	B
HCM 95th %tile Q(veh)	0.7	-	-	-	0.1	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	685	27	0	1097	0	5
Future Vol, veh/h	685	27	0	1097	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	745	29	0	1192	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	372
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	631
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	631
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

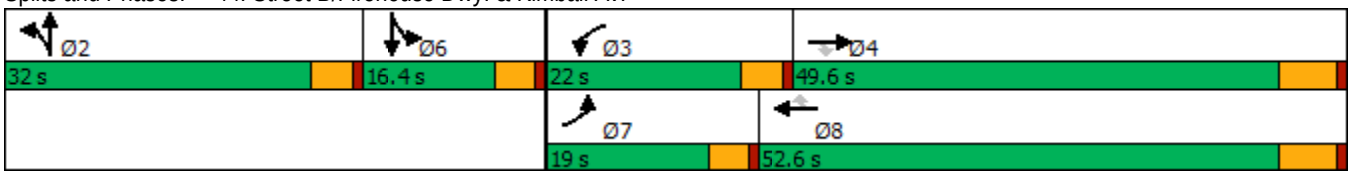
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	631	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-
HCM Control Delay (s)	10.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	3	422	266	79	1037	0	0
Future Volume (vph)	3	422	266	79	1037	0	0
Turn Type	Prot	NA	Perm	Prot	NA	NA	NA
Protected Phases	7	4		3	8	2	6
Permitted Phases			4				
Detector Phase	7	4	4	3	8	2	6
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	23.2	9.6	16.2	31.6	14.6
Total Split (s)	19.0	49.6	49.6	22.0	52.6	32.0	16.4
Total Split (%)	15.8%	41.3%	41.3%	18.3%	43.8%	26.7%	13.7%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	Max	None	None
Act Effct Green (s)	5.2	50.8	50.8	8.8	60.4	12.8	10.3
Actuated g/C Ratio	0.06	0.61	0.61	0.11	0.73	0.15	0.12
v/c Ratio	0.03	0.21	0.24	0.48	0.84	0.19	0.00
Control Delay	45.0	12.8	2.9	47.3	21.3	3.1	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	12.8	2.9	47.3	21.3	3.1	40.0
LOS	D	B	A	D	C	A	D
Approach Delay		9.1			23.2	3.1	40.0
Approach LOS		A			C	A	D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 82.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 17.3 — Intersection LOS: B
Intersection Capacity Utilization 82.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	422	266	79	1037	0	59	0	6	1	0	0
Future Volume (veh/h)	3	422	266	79	1037	0	59	0	6	1	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1872	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	3	464	182	87	1140	0	65	0	7	1	0	0
Adj No. of Lanes	1	2	1	1	1	1	0	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	2040	867	109	1179	964	157	0	17	5	0	0
Arrive On Green	0.00	0.57	0.57	0.07	0.63	0.00	0.10	0.00	0.10	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	1872	1530	1530	0	165	1714	0	0
Grp Volume(v), veh/h	3	464	182	87	1140	0	72	0	0	1	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1872	1530	1694	0	0	1714	0	0
Q Serve(g_s), s	0.1	4.9	4.5	4.1	44.2	0.0	3.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	4.9	4.5	4.1	44.2	0.0	3.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.90		0.10	1.00		0.00
Lane Grp Cap(c), veh/h	7	2040	867	109	1179	964	173	0	0	5	0	0
V/C Ratio(X)	0.46	0.23	0.21	0.80	0.97	0.00	0.42	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	304	2040	867	368	1179	964	606	0	0	264	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	38.1	8.3	8.2	35.2	13.4	0.0	32.2	0.0	0.0	38.1	0.0	0.0
Incr Delay (d2), s/veh	17.5	0.3	0.6	5.0	19.4	0.0	1.6	0.0	0.0	21.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.5	2.0	2.0	28.8	0.0	1.5	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	55.6	8.5	8.7	40.2	32.8	0.0	33.8	0.0	0.0	59.1	0.0	0.0
LnGrp LOS	E	A	A	D	C		C			E		
Approach Vol, veh/h		649			1227			72			1	
Approach Delay, s/veh		8.8			33.3			33.8			59.1	
Approach LOS		A			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.4	9.8	49.6		4.8	4.9	54.4
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		27.4	17.4	43.4		11.8	14.4	46.4
Max Q Clear Time (g_c+I1), s		5.1	6.1	6.9		2.0	2.1	46.2
Green Ext Time (p_c), s		0.3	0.1	3.5		0.0	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.2
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	0	0	0	0	7	0	48	0	44	251	49
Future Vol, veh/h	9	0	0	0	0	7	0	48	0	44	251	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	0	0	0	0	8	0	52	0	48	273	53

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	451	447	299	447	474	52	326	0	0	52	0	0
Stage 1	395	395	-	52	52	-	-	-	-	-	-	-
Stage 2	56	52	-	395	422	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	522	509	745	525	492	1021	1245	-	-	1567	-	-
Stage 1	634	608	-	966	856	-	-	-	-	-	-	-
Stage 2	961	856	-	634	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	503	490	745	510	473	1021	1245	-	-	1567	-	-
Mov Cap-2 Maneuver	503	490	-	510	473	-	-	-	-	-	-	-
Stage 1	634	585	-	966	856	-	-	-	-	-	-	-
Stage 2	954	856	-	610	570	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	8.6	0	0.9
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1245	-	-	503	1021	1567	-	-
HCM Lane V/C Ratio	-	-	-	0.019	0.007	0.031	-	-
HCM Control Delay (s)	0	-	-	12.3	8.6	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	47	246	5
Future Vol, veh/h	1	0	0	47	246	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	0	0	51	267	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	321	270	273	0	-	0
Stage 1	270	-	-	-	-	-
Stage 2	51	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	677	774	1302	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	677	774	1302	-	-	-
Mov Cap-2 Maneuver	677	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	977	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1302	-	677	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	10.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	17	0	155	91
Future Vol, veh/h	0	30	17	0	155	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	33	18	0	168	99

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	454	18	0	0	18	0
Stage 1	18	-	-	-	-	-
Stage 2	436	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	568	1066	-	-	1612	-
Stage 1	1010	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	506	1066	-	-	1612	-
Mov Cap-2 Maneuver	506	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	584	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	4.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1066	1612	-
HCM Lane V/C Ratio	-	-	0.031	0.105	-
HCM Control Delay (s)	-	-	8.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.3	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	412	16	0	1116	0	4
Future Vol, veh/h	412	16	0	1116	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	448	17	0	1213	0	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	224
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	786
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	786
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	786	-	-	-
HCM Lane V/C Ratio	0.006	-	-	-
HCM Control Delay (s)	9.6	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	406	21	11	1129	20	20
Future Vol, veh/h	406	21	11	1129	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	423	22	11	1176	21	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	445	0	1633	222
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	1199	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1126	-	103	788
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	288	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1126	-	102	788
Mov Cap-2 Maneuver	-	-	-	-	256	-
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	285	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	256	788	-	-	1126	-
HCM Lane V/C Ratio	0.081	0.026	-	-	0.01	-
HCM Control Delay (s)	20.3	9.7	-	-	8.2	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	368	23	984	154	18
Future Volume (vph)	368	23	984	154	18
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	33.2	5.0	36.9	10.0	10.0
Actuated g/C Ratio	0.57	0.09	0.63	0.17	0.17
v/c Ratio	0.24	0.18	0.95	0.61	0.07
Control Delay	6.9	28.9	29.2	34.5	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	28.9	29.2	34.5	11.2
LOS	A	C	C	C	B
Approach Delay	6.9		29.2	32.0	
Approach LOS	A		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 58.3	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	368	58	23	984	154	18
Future Volume (veh/h)	368	58	23	984	154	18
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	404	64	25	1081	169	17
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1556	245	46	1142	278	262
Arrive On Green	0.53	0.53	0.03	0.63	0.17	0.17
Sat Flow, veh/h	3042	464	1619	1800	1619	1530
Grp Volume(v), veh/h	233	235	25	1081	169	17
Grp Sat Flow(s),veh/h/ln	1710	1706	1619	1800	1619	1530
Q Serve(g_s), s	4.3	4.4	0.9	32.0	5.6	0.5
Cycle Q Clear(g_c), s	4.3	4.4	0.9	32.0	5.6	0.5
Prop In Lane		0.27	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	902	899	46	1142	278	262
V/C Ratio(X)	0.26	0.26	0.54	0.95	0.61	0.06
Avail Cap(c_a), veh/h	902	899	139	1195	278	262
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.5	7.6	27.9	9.7	22.3	20.2
Incr Delay (d2), s/veh	0.1	0.2	3.6	14.7	9.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.1	0.4	20.0	3.2	0.3
LnGrp Delay(d),s/veh	7.7	7.7	31.6	24.4	31.9	20.7
LnGrp LOS	A	A	C	C	C	C
Approach Vol, veh/h	468			1106	186	
Approach Delay, s/veh	7.7			24.6	30.9	
Approach LOS	A			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.3	36.9				43.2		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	2.9	6.4				34.0		7.6
Green Ext Time (p_c), s	0.0	11.5				3.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	20.8
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	286	61	789	218	65
Future Volume (vph)	286	61	789	218	65
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	25.2	5.4	30.8	13.6	13.6
Actuated g/C Ratio	0.46	0.10	0.56	0.25	0.25
v/c Ratio	0.31	0.44	0.89	0.62	0.19
Control Delay	11.1	35.5	23.2	29.2	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	35.5	23.2	29.2	16.9
LOS	B	D	C	C	B
Approach Delay	11.1		24.1	26.4	
Approach LOS	B		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 55.3	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 66.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	286	125	61	789	218	65
Future Volume (veh/h)	286	125	61	789	218	65
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	321	140	69	887	245	55
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	977	416	96	1015	391	370
Arrive On Green	0.42	0.42	0.06	0.56	0.24	0.24
Sat Flow, veh/h	2407	987	1619	1800	1619	1530
Grp Volume(v), veh/h	235	226	69	887	245	55
Grp Sat Flow(s),veh/h/ln	1710	1594	1619	1800	1619	1530
Q Serve(g_s), s	5.1	5.3	2.3	23.5	7.5	1.6
Cycle Q Clear(g_c), s	5.1	5.3	2.3	23.5	7.5	1.6
Prop In Lane		0.62	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	721	672	96	1015	391	370
V/C Ratio(X)	0.33	0.34	0.72	0.87	0.63	0.15
Avail Cap(c_a), veh/h	795	742	158	1162	391	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.7	10.8	25.6	10.4	18.8	16.5
Incr Delay (d2), s/veh	0.3	0.3	3.8	6.9	7.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	2.4	1.1	13.3	4.1	0.7
LnGrp Delay(d),s/veh	11.0	11.1	29.5	17.3	26.2	17.4
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	461			956	300	
Approach Delay, s/veh	11.1			18.2	24.6	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.9	29.6				37.5		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.3	7.3				25.5		9.5
Green Ext Time (p_c), s	0.0	8.2				5.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	255	8	5	757	113	14	19	17	38	12	79
Future Vol, veh/h	87	255	8	5	757	113	14	19	17	38	12	79
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	92	268	8	5	797	119	15	20	18	40	13	83

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	917	0	0	279	0	0	1373	1385	141	1196	1330	857
Stage 1	-	-	-	-	-	-	458	458	-	868	868	-
Stage 2	-	-	-	-	-	-	915	927	-	328	462	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	752	-	-	1295	-	-	115	145	888	154	156	360
Stage 1	-	-	-	-	-	-	557	570	-	350	372	-
Stage 2	-	-	-	-	-	-	329	350	-	664	568	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	752	-	-	1294	-	-	77	126	885	126	136	360
Mov Cap-2 Maneuver	-	-	-	-	-	-	128	203	-	230	253	-
Stage 1	-	-	-	-	-	-	488	499	-	307	370	-
Stage 2	-	-	-	-	-	-	243	348	-	548	498	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0	25.8	26.7
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	225	752	-	-	1294	-	-	299
HCM Lane V/C Ratio	0.234	0.122	-	-	0.004	-	-	0.454
HCM Control Delay (s)	25.8	10.4	-	-	7.8	-	-	26.7
HCM Lane LOS	D	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.9	0.4	-	-	0	-	-	2.2

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	295	15	24	815	59	21
Future Vol, veh/h	295	15	24	815	59	21
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	324	16	26	896	65	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	342	0	1281	171
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	948	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1228	-	172	849
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	380	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1228	-	168	848
Mov Cap-2 Maneuver	-	-	-	-	335	-
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	372	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	398	-	-	1228	-
HCM Lane V/C Ratio	0.221	-	-	0.021	-
HCM Control Delay (s)	16.6	-	-	8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	108.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	316	0	0	0	0	0	839	0	0
Future Vol, veh/h	0	0	0	316	0	0	0	0	0	839	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	340	0	0	0	0	0	902	0	0
Number of Lanes	0	0	0	1	0	0	0	0	0	1	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay	14.1	143.5
HCM LOS	B	F

Lane	NBLn1	EBLn1
Vol Left, %	100%	0%
Vol Thru, %	0%	0%
Vol Right, %	0%	100%
Sign Control	Stop	Stop
Traffic Vol by Lane	839	316
LT Vol	839	0
Through Vol	0	0
RT Vol	0	316
Lane Flow Rate	902	340
Geometry Grp	1	1
Degree of Util (X)	1.254	0.49
Departure Headway (Hd)	5.004	5.751
Convergence, Y/N	Yes	Yes
Cap	722	632
Service Time	3.065	3.751
HCM Lane V/C Ratio	1.249	0.538
HCM Control Delay	143.5	14.1
HCM Lane LOS	F	B
HCM 95th-tile Q	32.8	2.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

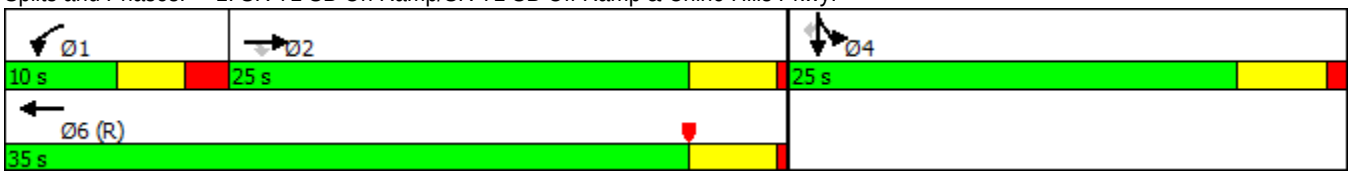
Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	0	0
Future Vol, veh/h	0	0	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	0	0
Number of Lanes	0	0	0	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1107	661	17	908	389	226	667
Future Volume (vph)	1107	661	17	908	389	226	667
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.40	0.71	0.13	0.55	0.62	0.58	1.19
Control Delay	11.4	9.5	37.7	9.4	23.3	21.6	123.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	9.5	37.7	9.4	23.3	21.6	123.8
LOS	B	A	D	A	C	C	F
Approach Delay	10.7			9.9		75.2	
Approach LOS	B			A		E	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 78.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1107	661	17	908	0	0	0	0	389	226	667
Future Volume (veh/h)	0	1107	661	17	908	0	0	0	0	389	226	667
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1165	570	18	956	0				324	358	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2498	608	35	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.04	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1165	570	18	956	0				324	358	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	8.3	21.8	0.7	0.0	0.0				10.0	9.9	0.0
Cycle Q Clear(g_c), s	0.0	8.3	21.8	0.7	0.0	0.0				10.0	9.9	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2498	608	35	1739	0				540	600	510
V/C Ratio(X)	0.00	0.47	0.94	0.51	0.55	0.00				0.60	0.60	0.00
Avail Cap(c_a), veh/h	0	2498	608	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.81	0.81	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.2	17.2	28.4	0.0	0.0				16.7	16.6	0.0
Incr Delay (d2), s/veh	0.0	0.1	22.3	3.5	1.0	0.0				4.9	4.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.5	12.6	0.3	0.2	0.0				5.1	5.6	0.0
LnGrp Delay(d),s/veh	0.0	13.3	39.4	31.9	1.0	0.0				21.5	21.0	0.0
LnGrp LOS		B	D	C	A					C	C	
Approach Vol, veh/h		1735			974						682	
Approach Delay, s/veh		21.9			1.6						21.2	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.3	28.7		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	23.8		12.0		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.5		20.7		

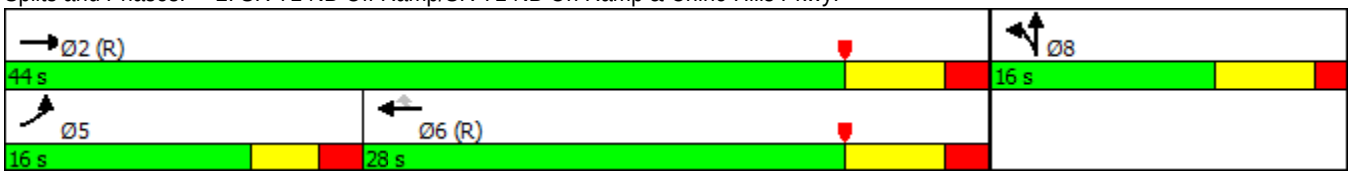
Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	395	1101	587	561	338	102
Future Volume (vph)	395	1101	587	561	338	102
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.8	37.5	21.7	21.7	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.80	0.55	0.51	0.86	0.74	0.56
Control Delay	36.4	9.1	16.9	25.5	44.9	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	9.1	16.9	25.5	44.9	27.5
LOS	D	A	B	C	D	C
Approach Delay		16.3	21.1			34.1
Approach LOS		B	C			C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 20.7	Intersection LOS: C
Intersection Capacity Utilization 78.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	395	1101	0	0	587	561	338	102	5	0	0	0
Future Volume (veh/h)	395	1101	0	0	587	561	338	102	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	425	1184	0	0	631	600	363	110	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	514	2138	0	0	1257	555	540	297	3			
Arrive On Green	0.17	0.63	0.00	0.00	0.37	0.37	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1781	16			
Grp Volume(v), veh/h	425	1184	0	0	631	600	363	0	111			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	8.3	11.9	0.0	0.0	8.6	22.1	6.3	0.0	3.3			
Cycle Q Clear(g_c), s	8.3	11.9	0.0	0.0	8.6	22.1	6.3	0.0	3.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	514	2138	0	0	1257	555	540	0	300			
V/C Ratio(X)	0.83	0.55	0.00	0.00	0.50	1.08	0.67	0.00	0.37			
Avail Cap(c_a), veh/h	542	2138	0	0	1257	555	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.58	0.58	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.9	6.5	0.0	0.0	14.7	19.0	23.5	0.0	22.2			
Incr Delay (d2), s/veh	8.9	0.9	0.0	0.0	0.8	53.8	6.6	0.0	3.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	5.7	0.0	0.0	4.2	17.4	3.3	0.0	1.9			
LnGrp Delay(d),s/veh	32.8	7.4	0.0	0.0	15.5	72.8	30.0	0.0	25.7			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1609			1231			474				
Approach Delay, s/veh		14.1			43.5			29.0				
Approach LOS		B			D			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			15.4	28.6		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		13.9			10.3	24.1		8.3
Green Ext Time (p_c), s		16.3			0.1	0.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	27.1
HCM 2010 LOS	C

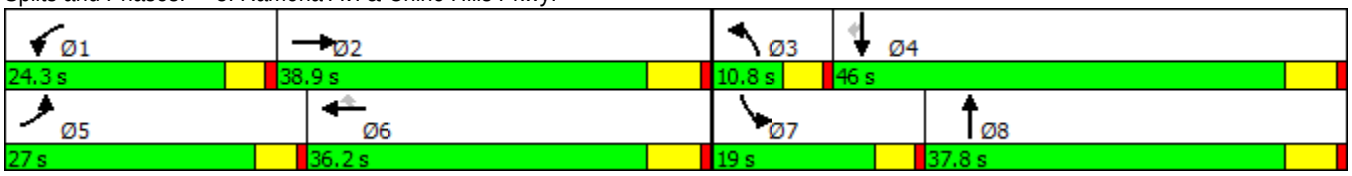
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	246	858	137	727	134	21	284	153	445	400
Future Volume (vph)	246	858	137	727	134	21	284	153	445	400
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	21.1	36.1	14.6	29.7	29.7	5.7	32.1	13.7	44.0	44.0
Actuated g/C Ratio	0.18	0.31	0.12	0.25	0.25	0.05	0.27	0.12	0.38	0.38
v/c Ratio	0.90	0.61	0.73	0.89	0.29	0.28	0.48	0.87	0.37	0.51
Control Delay	81.2	37.2	69.9	56.7	6.5	64.2	32.8	90.7	29.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	37.2	69.9	56.7	6.5	64.2	32.8	90.7	29.0	5.1
LOS	F	D	E	E	A	E	C	F	C	A
Approach Delay		47.0		51.8			34.3		28.9	
Approach LOS		D		D			C		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 117.3
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 41.7 — Intersection LOS: D
Intersection Capacity Utilization 89.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	858	2	137	727	134	21	284	134	153	445	400
Future Volume (veh/h)	246	858	2	137	727	134	21	284	134	153	445	400
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	262	913	2	146	773	98	22	302	88	163	473	316
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	287	1618	4	171	850	375	36	727	208	188	1272	561
Arrive On Green	0.18	0.32	0.32	0.11	0.25	0.25	0.02	0.28	0.28	0.12	0.37	0.37
Sat Flow, veh/h	1619	5063	11	1619	3420	1509	1619	2616	748	1619	3420	1507
Grp Volume(v), veh/h	262	591	324	146	773	98	22	195	195	163	473	316
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1654	1619	1710	1507
Q Serve(g_s), s	18.3	17.2	17.2	10.2	25.3	6.0	1.6	10.7	11.1	11.4	11.6	19.2
Cycle Q Clear(g_c), s	18.3	17.2	17.2	10.2	25.3	6.0	1.6	10.7	11.1	11.4	11.6	19.2
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	287	1047	575	171	850	375	36	475	460	188	1272	561
V/C Ratio(X)	0.91	0.56	0.56	0.85	0.91	0.26	0.62	0.41	0.42	0.87	0.37	0.56
Avail Cap(c_a), veh/h	315	1047	575	277	903	398	87	475	460	203	1272	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	32.5	32.5	50.6	42.0	34.8	55.8	33.9	34.0	50.0	26.4	28.7
Incr Delay (d2), s/veh	27.2	0.9	1.6	7.1	12.9	0.5	6.4	2.6	2.8	27.7	0.8	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.3	7.9	8.8	4.9	13.4	2.5	0.8	5.4	5.4	6.6	5.6	8.6
LnGrp Delay(d),s/veh	73.7	33.4	34.1	57.7	54.9	35.3	62.2	36.5	36.9	77.7	27.2	32.8
LnGrp LOS	E	C	C	E	D	D	E	D	D	E	C	C
Approach Vol, veh/h		1177			1017			412			952	
Approach Delay, s/veh		42.6			53.4			38.0			37.7	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.8	42.6	7.1	48.6	25.0	34.4	17.9	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	12.2	19.2	3.6	21.2	20.3	27.3	13.4	13.1
Green Ext Time (p_c), s	0.1	10.5	0.0	6.0	0.1	1.3	0.0	6.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	848	120	45	833	87	27
Future Vol, veh/h	848	120	45	833	87	27
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	942	133	50	926	97	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	945	0	1508	474
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	563	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	734	-	114	542
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	539	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	734	-	106	540
Mov Cap-2 Maneuver	-	-	-	-	284	-
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	502	-

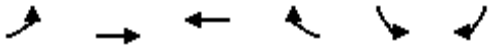
Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	23.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	320	-	-	734	-
HCM Lane V/C Ratio	0.396	-	-	0.068	-
HCM Control Delay (s)	23.4	-	-	10.3	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.8	-	-	0.2	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	119	756	645	58	232
Future Volume (vph)	119	756	645	58	232
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	10.8	40.7	25.2	23.6	35.6
Actuated g/C Ratio	0.14	0.54	0.33	0.31	0.47
v/c Ratio	0.56	0.45	0.68	0.07	0.32
Control Delay	41.8	11.2	25.1	22.3	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	11.2	25.1	22.3	6.9
LOS	D	B	C	C	A
Approach Delay		15.4	25.1	10.0	
Approach LOS		B	C	A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 76			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 58.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	756	645	60	58	232
Future Volume (veh/h)	119	756	645	60	58	232
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	129	822	701	63	63	66
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	160	1956	1320	119	843	587
Arrive On Green	0.10	0.57	0.42	0.42	0.29	0.29
Sat Flow, veh/h	1619	3510	3258	284	2956	1530
Grp Volume(v), veh/h	129	822	378	386	63	66
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1742	1478	1530
Q Serve(g_s), s	6.3	11.0	13.5	13.5	1.3	2.3
Cycle Q Clear(g_c), s	6.3	11.0	13.5	13.5	1.3	2.3
Prop In Lane	1.00			0.16	1.00	1.00
Lane Grp Cap(c), veh/h	160	1956	713	726	843	587
V/C Ratio(X)	0.81	0.42	0.53	0.53	0.07	0.11
Avail Cap(c_a), veh/h	565	3583	1098	1118	843	587
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	9.8	17.8	17.8	21.2	16.1
Incr Delay (d2), s/veh	3.6	0.2	0.9	0.9	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	5.2	6.5	6.6	0.5	2.5
LnGrp Delay(d),s/veh	39.5	10.0	18.6	18.6	21.4	16.5
LnGrp LOS	D	B	B	B	C	B
Approach Vol, veh/h		951	764		129	
Approach Delay, s/veh		14.0	18.6		18.9	
Approach LOS		B	B		B	

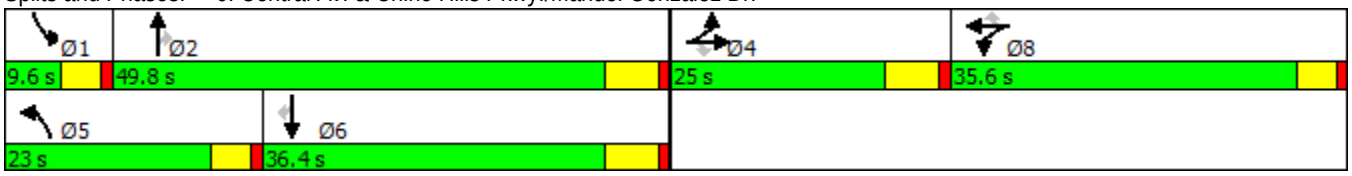
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		52.3		29.0	12.6	39.7		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		13.0		4.3	8.3	15.5		
Green Ext Time (p_c), s		23.5		0.3	0.1	18.4		

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	2	376	11	40	32	302	717	1	10	807	222
Future Volume (vph)	475	2	376	11	40	32	302	717	1	10	807	222
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.87	0.82	0.65	0.05	0.18	0.10	1.09	0.43	0.00	0.14	0.83	0.42
Control Delay	69.7	62.8	9.7	37.5	40.1	0.6	120.1	18.4	0.0	54.2	41.8	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	62.8	9.7	37.5	40.1	0.6	120.1	18.4	0.0	54.2	41.8	14.7
LOS	E	E	A	D	D	A	F	B	A	D	D	B
Approach Delay		41.3			24.4			48.5			36.2	
Approach LOS		D			C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 41.5	Intersection LOS: D
Intersection Capacity Utilization 77.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	475	2	376	11	40	32	302	717	1	10	807	222
Future Volume (veh/h)	475	2	376	11	40	32	302	717	1	10	807	222
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	517	0	281	12	43	18	328	779	1	11	877	171
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	633	0	299	152	169	143	303	1661	742	21	1065	470
Arrive On Green	0.20	0.00	0.20	0.09	0.09	0.09	0.19	0.49	0.49	0.01	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	517	0	281	12	43	18	328	779	1	11	877	171
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	15.0	0.0	17.8	0.7	2.2	1.1	18.4	14.9	0.0	0.7	23.3	8.6
Cycle Q Clear(g_c), s	15.0	0.0	17.8	0.7	2.2	1.1	18.4	14.9	0.0	0.7	23.3	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	633	0	299	152	169	143	303	1661	742	21	1065	470
V/C Ratio(X)	0.82	0.00	0.94	0.08	0.25	0.13	1.08	0.47	0.00	0.51	0.82	0.36
Avail Cap(c_a), veh/h	633	0	299	511	568	480	303	1661	742	82	1065	470
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	0.0	39.0	40.6	41.3	40.8	39.9	16.8	13.0	48.2	31.3	26.3
Incr Delay (d2), s/veh	8.2	0.0	36.4	0.2	0.8	0.4	75.2	1.0	0.0	7.0	7.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.0	10.5	0.3	1.1	0.5	14.5	7.3	0.0	0.3	12.0	3.9
LnGrp Delay(d),s/veh	46.1	0.0	75.3	40.8	42.1	41.2	115.1	17.8	13.0	55.1	38.5	28.4
LnGrp LOS	D		E	D	D	D	F	B	B	E	D	C
Approach Vol, veh/h		798			73			1108			1059	
Approach Delay, s/veh		56.4			41.7			46.6			37.1	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	53.5		25.0	23.0	36.4		13.9
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	16.9		19.8	20.4	25.3		4.2
Green Ext Time (p_c), s	0.0	17.9		0.0	0.0	4.5		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	45.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	5	609	4	437	9	550	694	522	682
Future Volume (vph)	25	5	609	4	437	9	550	694	522	682
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.1	10.1	25.7	25.7	69.4	5.0	23.9	23.9	37.8	64.5
Actuated g/C Ratio	0.09	0.09	0.23	0.23	0.62	0.04	0.21	0.21	0.34	0.58
v/c Ratio	0.18	0.16	0.90	0.86	0.44	0.12	0.78	0.89	1.00	0.26
Control Delay	53.9	26.6	72.0	64.7	7.0	59.3	51.7	21.9	77.3	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	26.6	72.0	64.7	7.0	59.3	51.7	21.9	77.3	13.8
LOS	D	C	E	E	A	E	D	C	E	B
Approach Delay		40.2		42.8			35.3			40.9
Approach LOS		D		D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.9	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 39.5	Intersection LOS: D
Intersection Capacity Utilization 98.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	5	20	609	4	437	9	550	694	522	682	17
Future Volume (veh/h)	25	5	20	609	4	437	9	550	694	522	682	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	5	12	637	0	304	9	573	547	544	710	14
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	105	31	73	716	0	838	18	706	311	529	2588	51
Arrive On Green	0.06	0.06	0.06	0.22	0.00	0.22	0.01	0.21	0.21	0.33	0.52	0.52
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4959	98
Grp Volume(v), veh/h	26	0	17	637	0	304	9	573	547	544	469	255
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.8	0.0	1.2	21.9	0.0	12.9	0.6	18.3	23.7	37.5	9.2	9.2
Cycle Q Clear(g_c), s	1.8	0.0	1.2	21.9	0.0	12.9	0.6	18.3	23.7	37.5	9.2	9.2
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	105	0	104	716	0	838	18	706	311	529	1710	929
V/C Ratio(X)	0.25	0.00	0.16	0.89	0.00	0.36	0.51	0.81	1.76	1.03	0.27	0.27
Avail Cap(c_a), veh/h	141	0	139	789	0	873	70	706	311	529	1710	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	0.0	50.7	43.4	0.0	14.7	56.5	43.5	45.6	38.7	15.3	15.3
Incr Delay (d2), s/veh	0.5	0.0	0.3	11.5	0.0	0.3	8.3	9.9	354.1	46.8	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	11.0	0.0	5.5	0.3	9.6	40.4	23.5	4.3	4.7
LnGrp Delay(d),s/veh	51.5	0.0	51.0	54.9	0.0	14.9	64.8	53.3	399.7	85.5	15.7	16.1
LnGrp LOS	D		D	D		B	E	D	F	F	B	B
Approach Vol, veh/h		43			941			1129			1268	
Approach Delay, s/veh		51.3			42.0			221.2			45.7	
Approach LOS		D			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.1	5.8	65.8		31.2
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.5	25.7		3.8	2.6	11.2		23.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	22.0		1.5

Intersection Summary		
HCM 2010 Ctrl Delay		103.3
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1142	846	152
Future Volume (vph)	1142	846	152
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	87.5	87.5	23.0
Actuated g/C Ratio	0.73	0.73	0.19
v/c Ratio	0.46	0.25	1.02dr
Control Delay	4.6	6.0	50.9
Queue Delay	0.0	0.0	0.0
Total Delay	4.6	6.0	50.9
LOS	A	A	D
Approach Delay	4.6	6.0	50.9
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 56.3%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1142	367	0	846	152	328
Future Volume (veh/h)	1142	367	0	846	152	328
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1202	386	0	891	160	184
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2883	925	0	3844	224	212
Arrive On Green	1.00	1.00	0.00	0.78	0.14	0.14
Sat Flow, veh/h	3847	1182	0	5238	1619	1530
Grp Volume(v), veh/h	1069	519	0	891	160	184
Grp Sat Flow(s),veh/h/ln	1638	1591	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	5.8	11.3	14.1
Cycle Q Clear(g_c), s	0.0	0.0	0.0	5.8	11.3	14.1
Prop In Lane		0.74	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2563	1245	0	3844	224	212
V/C Ratio(X)	0.42	0.42	0.00	0.23	0.71	0.87
Avail Cap(c_a), veh/h	2563	1245	0	3844	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.5	49.4	50.6
Incr Delay (d2), s/veh	0.5	1.0	0.0	0.1	1.6	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.0	2.6	5.2	6.2
LnGrp Delay(d),s/veh	0.5	1.0	0.0	3.6	51.0	54.8
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1588			891	344	
Approach Delay, s/veh	0.7			3.6	53.0	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		98.4				98.4		21.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				7.8		16.1
Green Ext Time (p_c), s		18.1				17.9		0.5

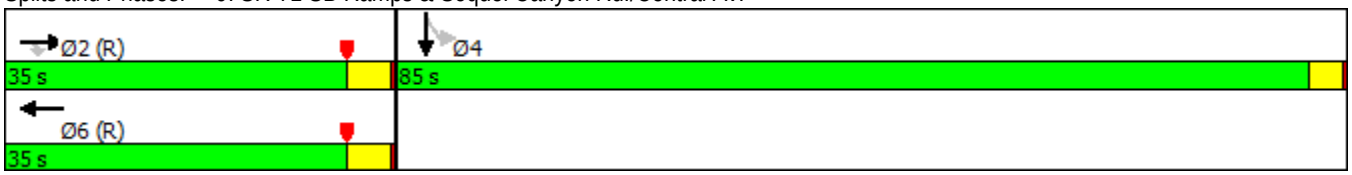
Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	681	85	662	829	0
Future Volume (vph)	681	85	662	829	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	32.9	32.9	32.9	79.1	79.1
Actuated g/C Ratio	0.27	0.27	0.27	0.66	0.66
v/c Ratio	0.51	0.18	0.74	0.74	0.86
Control Delay	39.1	8.3	39.7	18.9	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	8.3	39.7	18.9	25.7
LOS	D	A	D	B	C
Approach Delay	35.7		39.7		22.5
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 30.6	Intersection LOS: C
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	681	85	0	662	335	0	0	0	829	0	751
Future Volume (veh/h)	0	681	85	0	662	335	0	0	0	829	0	751
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	688	0	0	669	338				735	143	633
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2018	628	0	1345	628				846	152	671
Arrive On Green	0.00	0.41	0.00	0.00	0.14	0.14				0.52	0.52	0.52
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	290	1284
Grp Volume(v), veh/h	0	688	0	0	669	338				735	0	776
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1573
Q Serve(g_s), s	0.0	11.5	0.0	0.0	22.7	24.7				47.6	0.0	55.7
Cycle Q Clear(g_c), s	0.0	11.5	0.0	0.0	22.7	24.7				47.6	0.0	55.7
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.82
Lane Grp Cap(c), veh/h	0	2018	628	0	1345	628				846	0	822
V/C Ratio(X)	0.00	0.34	0.00	0.00	0.50	0.54				0.87	0.00	0.94
Avail Cap(c_a), veh/h	0	2018	628	0	1345	628				1100	0	1069
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.2	0.0	0.0	40.4	41.3				25.0	0.0	27.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	1.3	3.3				5.1	0.0	12.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.3	0.0	0.0	10.6	11.1				22.4	0.0	26.9
LnGrp Delay(d),s/veh	0.0	24.7	0.0	0.0	41.7	44.5				30.1	0.0	39.2
LnGrp LOS		C			D	D				C		D
Approach Vol, veh/h		688			1007						1511	
Approach Delay, s/veh		24.7			42.7						34.8	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		53.8		66.2		53.8		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		13.5		57.7		26.7		
Green Ext Time (p_c), s		8.4		5.0		2.7		

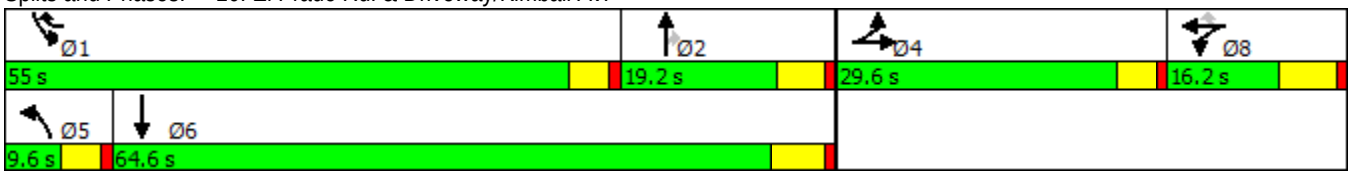
Intersection Summary	
HCM 2010 Ctrl Delay	35.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	34	8	3	709	4	192	23	826	336
Future Volume (vph)	34	8	3	709	4	192	23	826	336
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.17	0.07	0.14	0.62	0.05	0.74	0.07	0.98	0.17
Control Delay	42.6	29.8	48.4	5.0	53.2	60.2	0.3	53.5	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	29.8	48.4	5.0	53.2	60.2	0.3	53.5	10.7
LOS	D	C	D	A	D	E	A	D	B
Approach Delay		38.7	6.5			53.8			40.8
Approach LOS		D	A			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 30.5	Intersection LOS: C
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	8	8	22	3	709	4	192	23	826	336	13
Future Volume (veh/h)	34	8	8	22	3	709	4	192	23	826	336	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	36	8	6	23	3	295	4	202	23	869	354	13
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	71	53	149	19	900	79	236	200	795	1929	71
Arrive On Green	0.07	0.07	0.07	0.10	0.10	0.10	0.05	0.13	0.13	0.49	0.57	0.57
Sat Flow, veh/h	1619	956	717	1525	199	1530	1619	1800	1530	1619	3365	123
Grp Volume(v), veh/h	36	0	14	26	0	295	4	202	23	869	179	188
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1724	0	1530	1619	1800	1530	1619	1710	1778
Q Serve(g_s), s	2.2	0.0	0.8	1.4	0.0	10.0	0.2	11.3	1.4	50.4	5.1	5.2
Cycle Q Clear(g_c), s	2.2	0.0	0.8	1.4	0.0	10.0	0.2	11.3	1.4	50.4	5.1	5.2
Prop In Lane	1.00		0.43	0.88		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	124	168	0	900	79	236	200	795	980	1019
V/C Ratio(X)	0.30	0.00	0.11	0.15	0.00	0.33	0.05	0.86	0.11	1.09	0.18	0.18
Avail Cap(c_a), veh/h	394	0	408	168	0	900	79	246	209	795	980	1019
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	44.4	42.5	0.0	10.8	46.6	43.7	39.3	26.1	10.4	10.4
Incr Delay (d2), s/veh	1.4	0.0	0.4	0.4	0.0	0.2	0.1	24.0	0.3	60.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.4	0.7	0.0	4.3	0.1	7.2	0.6	35.6	2.4	2.5
LnGrp Delay(d),s/veh	46.4	0.0	44.8	42.9	0.0	11.0	46.7	67.6	39.6	86.5	10.5	10.5
LnGrp LOS	D		D	D		B	D	E	D	F	B	B
Approach Vol, veh/h		50			321			229			1236	
Approach Delay, s/veh		45.9			13.6			64.5			63.9	
Approach LOS		D			B			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.2		12.2	9.6	64.6		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	13.3		4.2	2.2	7.2		12.0
Green Ext Time (p_c), s	0.0	0.2		0.1	0.0	3.3		0.0

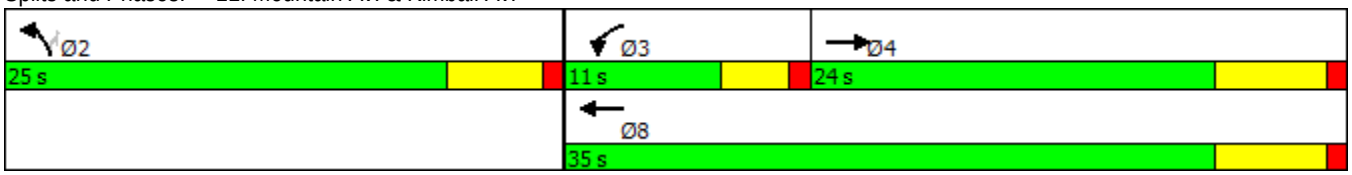
Intersection Summary	
HCM 2010 Ctrl Delay	54.7
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	880	14	638	94	62
Future Volume (vph)	880	14	638	94	62
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	18.6	7.3	20.2	8.8	8.8
Actuated g/C Ratio	0.46	0.18	0.50	0.22	0.22
v/c Ratio	0.67	0.05	0.41	0.30	0.18
Control Delay	14.8	18.3	7.8	16.1	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	18.3	7.8	16.1	5.9
LOS	B	B	A	B	A
Approach Delay	14.8		8.0	12.1	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 40.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 43.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	67	14	638	94	62
Future Volume (veh/h)	880	67	14	638	94	62
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	967	72	15	701	103	45
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1255	93	44	1780	297	281
Arrive On Green	0.39	0.39	0.03	0.52	0.18	0.18
Sat Flow, veh/h	3317	240	1619	3510	1619	1530
Grp Volume(v), veh/h	512	527	15	701	103	45
Grp Sat Flow(s),veh/h/ln	1710	1758	1619	1710	1619	1530
Q Serve(g_s), s	10.0	10.0	0.3	4.7	2.1	0.9
Cycle Q Clear(g_c), s	10.0	10.0	0.3	4.7	2.1	0.9
Prop In Lane		0.14	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	665	683	44	1780	297	281
V/C Ratio(X)	0.77	0.77	0.34	0.39	0.35	0.16
Avail Cap(c_a), veh/h	806	829	297	2599	836	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	10.2	18.2	5.5	13.6	13.1
Incr Delay (d2), s/veh	2.9	2.8	1.7	0.1	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	5.2	0.2	2.2	1.0	0.4
LnGrp Delay(d),s/veh	13.1	13.0	20.0	5.6	13.8	13.2
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	1039			716	148	
Approach Delay, s/veh	13.1			5.9	13.7	
Approach LOS	B			A	B	

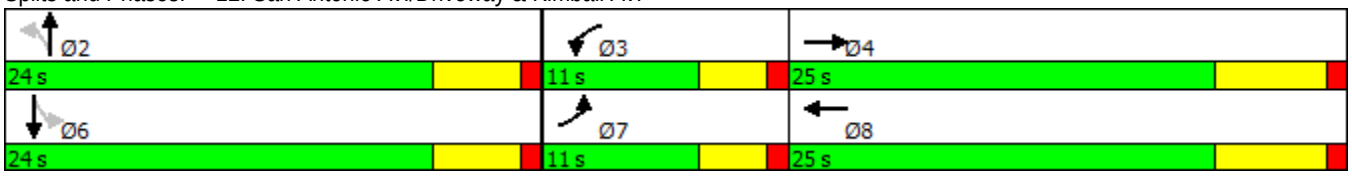
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	5.0	20.8				25.9
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		4.1	2.3	12.0				6.7
Green Ext Time (p_c), s		0.1	0.0	2.9				5.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	945	14	602	49	0		
Future Volume (vph)	945	14	602	49	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	25.0	11.0	25.0	24.0	24.0	24.0	11.0
Total Split (%)	41.7%	18.3%	41.7%	40.0%	40.0%	40%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	16.3	7.4	17.7	8.8	8.8		
Actuated g/C Ratio	0.43	0.19	0.46	0.23	0.23		
v/c Ratio	0.70	0.05	0.40	0.17	0.03		
Control Delay	14.8	18.0	7.6	14.6	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	14.8	18.0	7.6	14.6	0.1		
LOS	B	B	A	B	A		
Approach Delay	14.8		7.9		10.9		
Approach LOS	B		A		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 38.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 43.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	945	19	14	602	0	49	0	17	0	0	0
Future Volume (veh/h)	0	945	19	14	602	0	49	0	17	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	995	20	15	634	0	52	0	16	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	4	1318	26	44	1775	0	498	0	288	194	339	0
Arrive On Green	0.00	0.38	0.38	0.03	0.52	0.00	0.19	0.00	0.19	0.00	0.00	0.00
Sat Flow, veh/h	1619	3429	69	1619	3510	0	1619	0	1530	1340	1800	0
Grp Volume(v), veh/h	0	496	519	15	634	0	52	0	16	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1788	1619	1710	0	1619	0	1530	1340	1800	0
Q Serve(g_s), s	0.0	9.4	9.4	0.3	4.1	0.0	1.0	0.0	0.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.4	9.4	0.3	4.1	0.0	1.0	0.0	0.3	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	4	657	687	44	1775	0	498	0	288	194	339	0
V/C Ratio(X)	0.00	0.75	0.75	0.34	0.36	0.00	0.10	0.00	0.06	0.00	0.00	0.00
Avail Cap(c_a), veh/h	305	873	913	305	1775	0	1025	0	785	629	924	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.9	9.9	17.8	5.3	0.0	12.7	0.0	12.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.7	1.6	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.6	4.8	0.2	1.9	0.0	0.5	0.0	0.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	11.6	11.6	19.5	5.3	0.0	12.7	0.0	12.4	0.0	0.0	0.0
LnGrp LOS		B	B	B	A		B		B			
Approach Vol, veh/h		1015			649			68			0	
Approach Delay, s/veh		11.6			5.7			12.6			0.0	
Approach LOS		B			A			B				

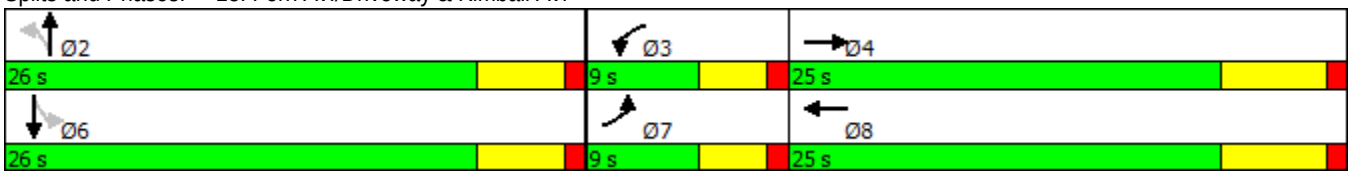
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.0	20.3		11.9	0.0	25.3
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		3.0	2.3	11.4		0.0	0.0	6.1
Green Ext Time (p_c), s		0.0	0.0	2.9		0.0	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	950	11	544	45	1	100	7
Future Volume (vph)	4	950	11	544	45	1	100	7
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	19.5	5.2	19.5	8.7	8.7	8.7	8.7
Actuated g/C Ratio	0.13	0.48	0.13	0.48	0.21	0.21	0.21	0.21
v/c Ratio	0.02	0.67	0.06	0.38	0.19	0.12	0.43	0.10
Control Delay	20.8	14.3	20.8	9.5	14.8	6.2	19.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	14.3	20.8	9.5	14.8	6.2	19.1	7.7
LOS	C	B	C	A	B	A	B	A
Approach Delay		14.4		9.7		10.9		16.4
Approach LOS		B		A		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 40.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 50.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	950	21	11	544	0	45	1	37	100	7	24
Future Volume (veh/h)	4	950	21	11	544	0	45	1	37	100	7	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	1080	18	12	618	0	51	1	22	114	8	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	11	1434	24	25	1456	0	400	10	229	393	121	136
Arrive On Green	0.01	0.42	0.42	0.02	0.43	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1619	3441	57	1619	3510	0	1339	67	1473	1332	775	872
Grp Volume(v), veh/h	5	537	561	12	618	0	51	0	23	114	0	17
Grp Sat Flow(s),veh/h/ln	1619	1710	1788	1619	1710	0	1339	0	1540	1332	0	1646
Q Serve(g_s), s	0.1	9.5	9.5	0.3	4.5	0.0	1.2	0.0	0.5	2.8	0.0	0.3
Cycle Q Clear(g_c), s	0.1	9.5	9.5	0.3	4.5	0.0	1.5	0.0	0.5	3.3	0.0	0.3
Prop In Lane	1.00		0.03	1.00		0.00	1.00		0.96	1.00		0.53
Lane Grp Cap(c), veh/h	11	713	745	25	1456	0	400	0	240	393	0	256
V/C Ratio(X)	0.46	0.75	0.75	0.47	0.42	0.00	0.13	0.00	0.10	0.29	0.00	0.07
Avail Cap(c_a), veh/h	228	931	974	228	1862	0	989	0	917	979	0	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.5	8.8	8.8	17.3	7.1	0.0	13.4	0.0	12.8	14.2	0.0	12.8
Incr Delay (d2), s/veh	10.5	1.7	1.6	4.9	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.7	4.9	0.1	2.1	0.0	0.4	0.0	0.2	1.1	0.0	0.1
LnGrp Delay(d),s/veh	28.1	10.5	10.4	22.2	7.2	0.0	13.5	0.0	12.9	14.4	0.0	12.8
LnGrp LOS	C	B	B	C	A		B		B	B		B
Approach Vol, veh/h		1103			630			74			131	
Approach Delay, s/veh		10.5			7.5			13.3			14.2	
Approach LOS		B			A			B			B	

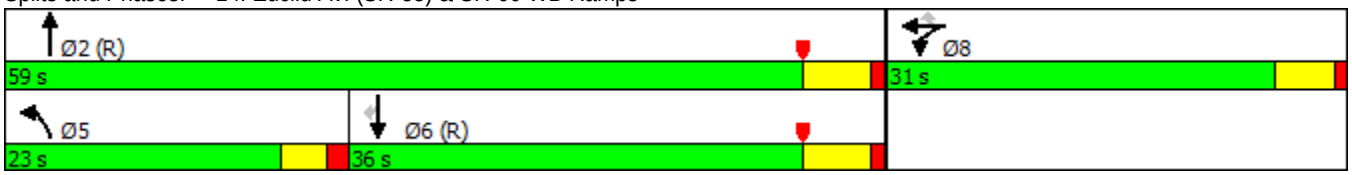
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.4	4.6	20.5		10.4	4.2	20.8
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		3.5	2.3	11.5		5.3	2.1	6.5
Green Ext Time (p_c), s		0.2	0.0	3.3		0.2	0.0	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	549	6	398	291	991	860	518
Future Volume (vph)	549	6	398	291	991	860	518
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.5	23.5	23.5	18.8	56.0	32.8	32.8
Actuated g/C Ratio	0.26	0.26	0.26	0.21	0.62	0.36	0.36
v/c Ratio	0.87	0.83	0.70	0.91	0.49	0.73	0.62
Control Delay	53.9	47.1	28.5	53.6	20.4	29.6	5.6
Queue Delay	0.0	0.0	0.0	0.0	1.4	0.0	0.0
Total Delay	53.9	47.1	28.5	53.6	21.8	29.6	5.6
LOS	D	D	C	D	C	C	A
Approach Delay		43.7			29.0	20.6	
Approach LOS		D			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 29.7	Intersection LOS: C
Intersection Capacity Utilization 94.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	549	6	398	291	991	0	0	860	518
Future Volume (veh/h)	0	0	0	549	6	398	291	991	0	0	860	518
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				663	0	178	306	1043	0	0	905	545
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				751	0	350	328	2228	0	0	1363	591
Arrive On Green				0.23	0.00	0.23	0.41	1.00	0.00	0.00	0.40	0.40
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1482
Grp Volume(v), veh/h				663	0	178	306	1043	0	0	905	545
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1482
Q Serve(g_s), s				17.8	0.0	9.2	16.3	0.0	0.0	0.0	19.5	31.5
Cycle Q Clear(g_c), s				17.8	0.0	9.2	16.3	0.0	0.0	0.0	19.5	31.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				751	0	350	328	2228	0	0	1363	591
V/C Ratio(X)				0.88	0.00	0.51	0.93	0.47	0.00	0.00	0.66	0.92
Avail Cap(c_a), veh/h				935	0	436	333	2228	0	0	1363	591
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.55	0.55	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.4	0.0	30.1	26.1	0.0	0.0	0.0	22.1	25.7
Incr Delay (d2), s/veh				7.4	0.0	0.4	20.9	0.4	0.0	0.0	2.6	22.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.7	0.0	3.9	9.0	0.1	0.0	0.0	9.7	16.5
LnGrp Delay(d),s/veh				40.8	0.0	30.5	47.0	0.4	0.0	0.0	24.7	47.9
LnGrp LOS				D		C	D	A			C	D
Approach Vol, veh/h					841			1349			1450	
Approach Delay, s/veh					38.6			11.0			33.4	
Approach LOS					D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		64.1			22.8	41.4		25.9
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			18.3	33.5		19.8
Green Ext Time (p_c), s		37.8			0.0	0.0		1.1

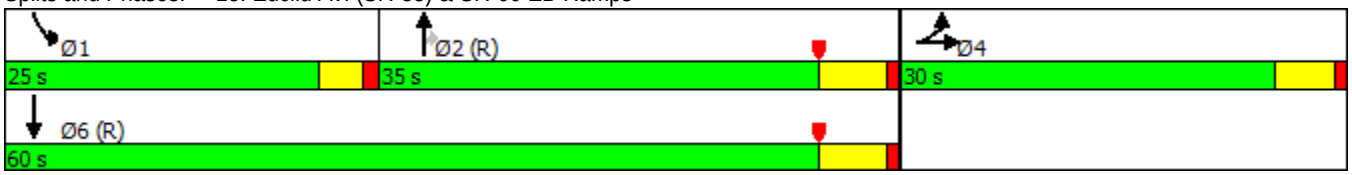
Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	370	2	912	639	295	1113
Future Volume (vph)	370	2	912	639	295	1113
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.6	22.6	33.7	33.7	19.2	56.9
Actuated g/C Ratio	0.25	0.25	0.37	0.37	0.21	0.63
v/c Ratio	0.88	0.89	0.73	0.68	0.88	0.53
Control Delay	57.0	48.4	29.7	6.2	52.8	4.1
Queue Delay	3.5	3.3	0.0	0.0	0.0	0.4
Total Delay	60.5	51.8	29.7	6.2	52.8	4.5
LOS	E	D	C	A	D	A
Approach Delay		55.9	20.0			14.6
Approach LOS		E	C			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 24.9	Intersection LOS: C
Intersection Capacity Utilization 94.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	2	340	0	0	0	0	912	639	295	1113	0
Future Volume (veh/h)	370	2	340	0	0	0	0	912	639	295	1113	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	325	76	270				0	931	652	301	1136	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	393	84	300				0	1341	583	330	2190	0
Arrive On Green	0.24	0.24	0.24				0.00	0.39	0.39	0.27	0.85	0.00
Sat Flow, veh/h	1619	348	1235				0	3510	1486	1619	3510	0
Grp Volume(v), veh/h	325	0	346				0	931	652	301	1136	0
Grp Sat Flow(s),veh/h/ln	1619	0	1582				0	1710	1486	1619	1710	0
Q Serve(g_s), s	17.1	0.0	19.1				0.0	20.5	35.3	16.2	7.9	0.0
Cycle Q Clear(g_c), s	17.1	0.0	19.1				0.0	20.5	35.3	16.2	7.9	0.0
Prop In Lane	1.00		0.78				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	393	0	384				0	1341	583	330	2190	0
V/C Ratio(X)	0.83	0.00	0.90				0.00	0.69	1.12	0.91	0.52	0.00
Avail Cap(c_a), veh/h	450	0	439				0	1341	583	378	2190	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.81	0.81	0.56	0.56	0.00
Uniform Delay (d), s/veh	32.3	0.0	33.0				0.0	22.8	27.4	32.0	3.0	0.0
Incr Delay (d2), s/veh	9.5	0.0	18.3				0.0	2.4	71.3	14.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	0.0	10.3				0.0	10.0	25.9	8.5	3.6	0.0
LnGrp Delay(d),s/veh	41.8	0.0	51.3				0.0	25.3	98.7	46.5	3.5	0.0
LnGrp LOS	D		D					C	F	D	A	
Approach Vol, veh/h		671						1583			1437	
Approach Delay, s/veh		46.7						55.5			12.5	
Approach LOS		D						E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.3	40.8		26.9		63.1		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	18.2	37.3		21.1		9.9		
Green Ext Time (p_c), s	0.1	0.0		0.8		36.5		

Intersection Summary	
HCM 2010 Ctrl Delay	37.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	119	308	92	268	125	1236	66	312	1002	132
Future Volume (vph)	119	308	92	268	125	1236	66	312	1002	132
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	45.0	45.0	45.0	45.0	13.0	57.0	57.0	18.0	62.0	62.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	10.8%	47.5%	47.5%	15.0%	51.7%	51.7%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.0	26.0	27.0	27.0	17.7	59.6	59.6	18.3	60.6	60.6
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.15	0.50	0.50	0.15	0.50	0.50
v/c Ratio	0.90	0.61	0.73	0.52	0.55	0.53	0.09	0.72	0.42	0.17
Control Delay	97.3	39.3	71.4	35.4	64.6	11.2	0.2	58.6	20.1	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.3	39.3	71.4	35.4	64.6	11.2	0.2	58.6	20.1	3.5
LOS	F	D	E	D	E	B	A	E	C	A
Approach Delay		51.8		42.3		15.4			26.9	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 75.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	308	127	92	268	117	125	1236	66	312	1002	132
Future Volume (veh/h)	119	308	127	92	268	117	125	1236	66	312	1002	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	124	321	101	96	279	101	130	1288	46	325	1044	79
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	226	690	213	210	665	235	109	2379	730	333	2584	803
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.14	0.97	0.97	0.11	0.53	0.53
Sat Flow, veh/h	958	2564	792	925	2471	873	1619	4914	1509	2956	4914	1527
Grp Volume(v), veh/h	124	212	210	96	191	189	130	1288	46	325	1044	79
Grp Sat Flow(s),veh/h/ln	958	1710	1645	925	1710	1634	1619	1638	1509	1478	1638	1527
Q Serve(g_s), s	14.7	12.4	12.8	11.6	11.0	11.5	8.1	2.1	0.1	13.2	15.3	3.1
Cycle Q Clear(g_c), s	26.2	12.4	12.8	24.5	11.0	11.5	8.1	2.1	0.1	13.2	15.3	3.1
Prop In Lane	1.00		0.48	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	460	443	210	460	440	109	2379	730	333	2584	803
V/C Ratio(X)	0.55	0.46	0.47	0.46	0.42	0.43	1.19	0.54	0.06	0.98	0.40	0.10
Avail Cap(c_a), veh/h	277	551	531	267	566	541	109	2379	730	333	2584	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.35	0.35	0.35	0.84	0.84	0.84
Uniform Delay (d), s/veh	47.1	36.6	36.7	47.0	36.1	36.2	51.9	1.0	1.0	53.1	17.1	14.2
Incr Delay (d2), s/veh	2.1	0.7	0.8	1.5	0.6	0.7	112.9	0.3	0.1	38.9	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	6.0	5.9	3.1	5.3	5.3	7.0	0.5	0.1	7.2	7.0	1.3
LnGrp Delay(d),s/veh	49.1	37.3	37.5	48.5	36.7	36.9	164.8	1.3	1.0	92.0	17.5	14.4
LnGrp LOS	D	D	D	D	D	D	F	A	A	F	B	B
Approach Vol, veh/h		546			476			1464			1448	
Approach Delay, s/veh		40.1			39.2			15.8			34.1	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	63.4		38.6	13.0	68.4		38.6
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	13.5	51.7		38.7	8.1	* 58		* 40
Max Q Clear Time (g_c+I1), s	15.2	4.1		28.2	10.1	17.3		26.5
Green Ext Time (p_c), s	0.0	22.6		4.1	0.0	20.9		4.6

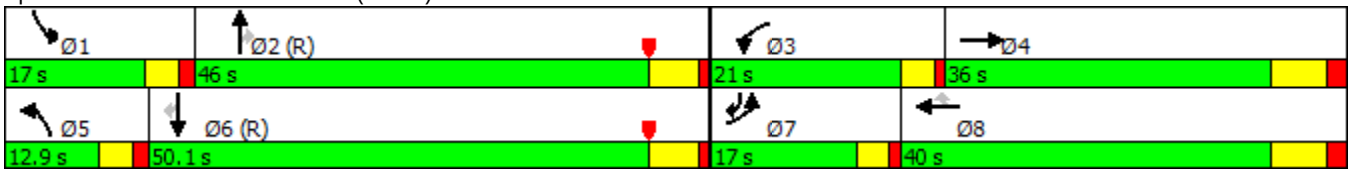
Intersection Summary	
HCM 2010 Ctrl Delay	28.7
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	144	369	168	331	53	74	1125	269	125	845	159
Future Volume (vph)	144	369	168	331	53	74	1125	269	125	845	159
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.8	22.8	15.7	25.8	25.8	9.9	46.6	46.6	13.9	50.5	64.8
Actuated g/C Ratio	0.11	0.19	0.13	0.22	0.22	0.08	0.39	0.39	0.12	0.42	0.54
v/c Ratio	0.91	0.71	0.86	0.49	0.14	0.60	0.91	0.40	0.72	0.63	0.19
Control Delay	101.0	50.0	85.1	42.7	1.8	61.4	47.4	18.4	61.0	34.7	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.0	50.0	85.1	42.7	1.8	61.4	47.4	18.4	61.0	34.7	11.7
LOS	F	D	F	D	A	E	D	B	E	C	B
Approach Delay		62.8		51.7			42.8			34.4	
Approach LOS		E		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 44.6	Intersection LOS: D
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	369	61	168	331	53	74	1125	269	125	845	159
Future Volume (veh/h)	144	369	61	168	331	53	74	1125	269	125	845	159
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	155	397	32	181	356	57	80	1210	158	134	909	73
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	566	45	205	666	293	99	1450	649	159	1575	860
Arrive On Green	0.11	0.18	0.18	0.13	0.19	0.19	0.02	0.14	0.14	0.03	0.15	0.15
Sat Flow, veh/h	1619	3207	257	1619	3420	1506	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	155	211	218	181	356	57	80	1210	158	134	909	73
Grp Sat Flow(s),veh/h/ln	1619	1710	1755	1619	1710	1506	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	11.3	13.9	14.0	13.2	11.2	3.8	5.9	41.3	11.0	9.9	29.6	4.0
Cycle Q Clear(g_c), s	11.3	13.9	14.0	13.2	11.2	3.8	5.9	41.3	11.0	9.9	29.6	4.0
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	302	309	205	666	293	99	1450	649	159	1575	860
V/C Ratio(X)	0.88	0.70	0.70	0.88	0.53	0.19	0.81	0.83	0.24	0.84	0.58	0.08
Avail Cap(c_a), veh/h	175	413	424	229	941	414	113	1450	649	169	1575	860
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.74	0.74	0.74	0.91	0.91	0.91
Uniform Delay (d), s/veh	52.8	46.4	46.5	51.5	43.4	40.4	58.1	47.5	34.5	57.1	40.0	18.9
Incr Delay (d2), s/veh	36.2	4.3	4.4	26.8	1.0	0.5	23.6	4.4	0.7	27.2	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	6.9	7.2	7.4	5.4	1.6	3.3	20.5	4.8	5.6	14.4	1.7
LnGrp Delay(d),s/veh	89.0	50.8	50.9	78.3	44.4	40.9	81.7	51.9	35.1	84.4	41.4	19.1
LnGrp LOS	F	D	D	E	D	D	F	D	D	F	D	B
Approach Vol, veh/h		584			594			1448			1116	
Approach Delay, s/veh		61.0			54.4			51.7			45.1	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	56.4	19.2	28.2	11.9	60.8	17.0	30.4
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	11.9	43.3	15.2	16.0	7.9	31.6	13.3	13.2
Green Ext Time (p_c), s	0.0	0.0	0.0	5.1	0.0	10.1	0.0	6.4

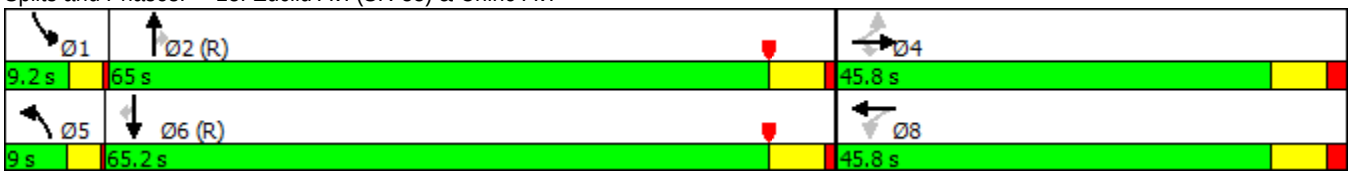
Intersection Summary	
HCM 2010 Ctrl Delay	51.6
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	67	166	35	69	93	55	1420	205	15	953	60
Future Volume (vph)	67	166	35	69	93	55	1420	205	15	953	60
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	45.8	45.8	45.8	45.8	45.8	9.0	65.0	65.0	9.2	65.2	65.2
Total Split (%)	38.2%	38.2%	38.2%	38.2%	38.2%	7.5%	54.2%	54.2%	7.7%	54.3%	54.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	21.7	21.7	21.7		21.7	9.1	81.2	81.2	5.9	74.6	74.6
Actuated g/C Ratio	0.18	0.18	0.18		0.18	0.08	0.68	0.68	0.05	0.62	0.62
v/c Ratio	0.42	0.53	0.11		0.86	0.47	0.63	0.20	0.19	0.46	0.06
Control Delay	48.8	48.9	3.9		77.2	64.0	13.3	4.6	78.1	6.7	0.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	48.9	3.9		77.2	64.0	13.3	4.6	78.1	6.7	0.3
LOS	D	D	A		E	E	B	A	E	A	A
Approach Delay		43.0			77.2		13.9			7.3	
Approach LOS		D			E		B			A	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 17.9 — Intersection LOS: B
Intersection Capacity Utilization 85.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	166	35	69	93	23	55	1420	205	15	953	60
Future Volume (veh/h)	67	166	35	69	93	23	55	1420	205	15	953	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	69	171	36	71	96	20	57	1464	155	15	982	33
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	220	371	315	111	137	25	71	2188	979	27	2095	917
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.06	0.85	0.85	0.03	1.00	1.00
Sat Flow, veh/h	1224	1800	1530	336	662	120	1619	3420	1530	1619	3420	1498
Grp Volume(v), veh/h	69	171	36	187	0	0	57	1464	155	15	982	33
Grp Sat Flow(s),veh/h/ln	1224	1800	1530	1118	0	0	1619	1710	1530	1619	1710	1498
Q Serve(g_s), s	0.0	10.0	2.3	10.7	0.0	0.0	4.2	17.8	2.1	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.6	10.0	2.3	20.7	0.0	0.0	4.2	17.8	2.1	1.1	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	371	315	272	0	0	71	2188	979	27	2095	917
V/C Ratio(X)	0.31	0.46	0.11	0.69	0.00	0.00	0.80	0.67	0.16	0.57	0.47	0.04
Avail Cap(c_a), veh/h	364	582	495	446	0	0	74	2188	979	77	2095	917
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.46	0.46	0.46	0.69	0.69	0.69
Uniform Delay (d), s/veh	42.0	41.8	38.7	47.3	0.0	0.0	56.0	4.5	3.4	57.6	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.9	0.2	3.1	0.0	0.0	22.0	0.8	0.2	4.8	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.1	1.0	6.2	0.0	0.0	2.3	8.1	0.9	0.5	0.2	0.0
LnGrp Delay(d),s/veh	42.8	42.7	38.9	50.4	0.0	0.0	78.0	5.3	3.5	62.4	0.5	0.1
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		276			187			1676			1030	
Approach Delay, s/veh		42.2			50.4			7.6			1.4	
Approach LOS		D			D			A			A	

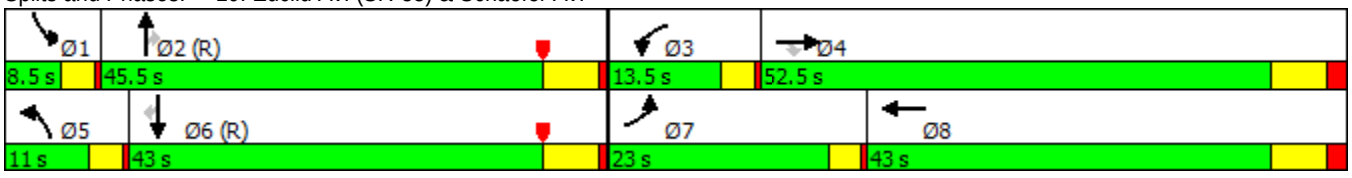
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	82.8		31.7	8.8	79.5		31.7
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	59.0		38.8	5.5	59.2		38.8
Max Q Clear Time (g_c+I1), s	3.1	19.8		12.6	6.2	2.0		22.7
Green Ext Time (p_c), s	0.0	25.3		2.3	0.0	31.4		2.0

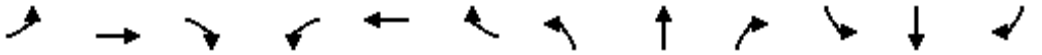
Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	288	217	158	25	47	95	1393	40	22	932	127
Future Volume (vph)	288	217	158	25	47	95	1393	40	22	932	127
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	26.9	26.9	10.0	14.4	12.1	66.3	66.3	5.7	56.5	56.5
Actuated g/C Ratio	0.16	0.22	0.22	0.08	0.12	0.10	0.55	0.55	0.05	0.47	0.47
v/c Ratio	1.13	0.56	0.35	0.19	0.28	0.60	0.76	0.05	0.30	0.60	0.17
Control Delay	142.0	45.5	6.6	55.0	38.5	52.0	27.5	2.1	68.4	26.3	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.0	45.5	6.6	55.0	38.5	52.0	27.5	2.1	68.4	26.3	7.0
LOS	F	D	A	E	D	D	C	A	E	C	A
Approach Delay		78.1			43.4		28.3			24.9	
Approach LOS		E			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 37.4	Intersection LOS: D
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	288	217	158	25	47	14	95	1393	40	22	932	127
Future Volume (veh/h)	288	217	158	25	47	14	95	1393	40	22	932	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	297	224	87	26	48	9	98	1436	32	23	961	78
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	313	266	78	88	16	101	2014	901	36	1877	821
Arrive On Green	0.16	0.17	0.17	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1475	277	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	297	224	87	26	0	57	98	1436	32	23	961	78
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1751	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	14.1	6.0	1.9	0.0	3.8	7.3	47.1	2.0	1.7	30.4	5.2
Cycle Q Clear(g_c), s	19.5	14.1	6.0	1.9	0.0	3.8	7.3	47.1	2.0	1.7	30.4	5.2
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	313	266	78	0	104	101	2014	901	36	1877	821
V/C Ratio(X)	1.13	0.72	0.33	0.33	0.00	0.55	0.97	0.71	0.04	0.64	0.51	0.10
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	2014	901	67	1877	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.53	0.53	0.53	0.89	0.89	0.89
Uniform Delay (d), s/veh	50.3	46.8	43.4	55.2	0.0	54.8	58.6	38.9	20.7	59.1	34.6	24.3
Incr Delay (d2), s/veh	94.7	2.3	0.5	0.9	0.0	3.3	55.8	1.2	0.0	6.0	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	7.2	2.6	0.9	0.0	1.9	4.8	22.7	0.9	0.8	14.7	2.2
LnGrp Delay(d),s/veh	144.9	49.1	44.0	56.1	0.0	58.1	114.4	40.0	20.7	65.1	35.5	24.5
LnGrp LOS	F	D	D	E		E	F	D	C	E	D	C
Approach Vol, veh/h		608			83			1566			1062	
Approach Delay, s/veh		95.2			57.5			44.3			35.4	
Approach LOS		F			E			D			D	

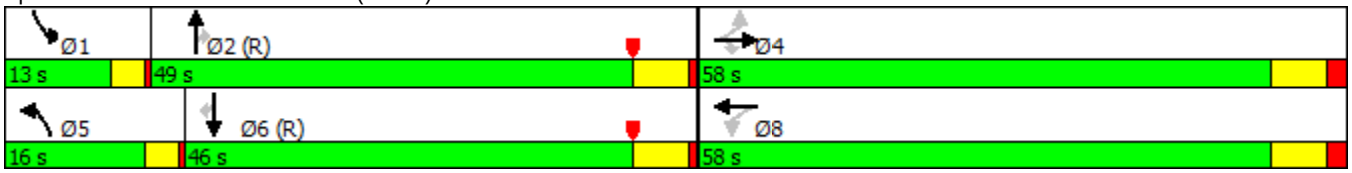
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	76.7	9.3	27.9	11.0	71.8	23.0	14.2
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.7	49.1	3.9	16.1	9.3	32.4	21.5	5.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	4.1	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	51.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	330	452	207	26	132	119	1135	75	66	880	163
Future Volume (vph)	330	452	207	26	132	119	1135	75	66	880	163
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7	12.0	54.1	54.1	8.5	48.9	48.9
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.10	0.45	0.45	0.07	0.41	0.41
v/c Ratio	0.87	0.72	0.31	0.17	0.26	0.76	0.75	0.11	0.59	0.64	0.23
Control Delay	58.2	39.5	4.1	26.0	24.8	61.4	47.4	19.6	86.4	19.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	39.5	4.1	26.0	24.8	61.4	47.4	19.6	86.4	19.9	5.1
LOS	E	D	A	C	C	E	D	B	F	B	A
Approach Delay		38.4			25.0		47.1			21.7	
Approach LOS		D			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 35.7	Intersection LOS: D
Intersection Capacity Utilization 87.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	452	207	26	132	29	119	1135	75	66	880	163
Future Volume (veh/h)	330	452	207	26	132	29	119	1135	75	66	880	163
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	337	461	119	27	135	25	121	1158	57	67	898	139
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	436	688	576	195	565	105	145	1468	657	83	1337	598
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.03	0.14	0.14	0.10	0.78	0.78
Sat Flow, veh/h	1176	1800	1508	800	1478	274	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	337	461	119	27	0	160	121	1158	57	67	898	139
Grp Sat Flow(s),veh/h/ln	1176	1800	1508	800	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	32.8	25.5	6.4	3.5	0.0	7.5	8.9	39.3	3.9	4.9	14.5	2.9
Cycle Q Clear(g_c), s	40.2	25.5	6.4	29.0	0.0	7.5	8.9	39.3	3.9	4.9	14.5	2.9
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	436	688	576	195	0	669	145	1468	657	83	1337	598
V/C Ratio(X)	0.77	0.67	0.21	0.14	0.00	0.24	0.83	0.79	0.09	0.81	0.67	0.23
Avail Cap(c_a), veh/h	487	765	641	230	0	744	169	1468	657	128	1337	598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.86	0.86	0.86	0.81	0.81	0.81
Uniform Delay (d), s/veh	38.9	30.8	24.9	42.9	0.0	25.2	57.3	46.2	31.1	53.3	9.6	8.3
Incr Delay (d2), s/veh	6.8	2.0	0.2	0.3	0.0	0.2	20.3	3.8	0.2	8.4	2.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	13.1	2.7	0.8	0.0	3.6	4.8	19.4	1.7	2.4	6.9	1.3
LnGrp Delay(d),s/veh	45.7	32.8	25.1	43.2	0.0	25.4	77.7	50.0	31.3	61.7	11.8	9.0
LnGrp LOS	D	C	C	D		C	E	D	C	E	B	A
Approach Vol, veh/h		917			187			1336			1104	
Approach Delay, s/veh		36.5			28.0			51.7			14.4	
Approach LOS		D			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	57.5		52.8	14.2	52.9		52.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	6.9	41.3		42.2	10.9	16.5		31.0
Green Ext Time (p_c), s	0.0	1.6		3.6	0.0	15.0		5.4

Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	47	27	154	6	12	93	1217	13	10	1086	49
Future Volume (vph)	47	27	154	6	12	93	1217	13	10	1086	49
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.3	15.3	15.3	15.3	15.3	11.4	92.5	92.5	5.5	79.3	79.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.10	0.77	0.77	0.05	0.66	0.66
v/c Ratio	0.32	0.13	0.49	0.04	0.11	0.66	0.50	0.01	0.15	0.52	0.05
Control Delay	47.8	41.4	10.2	37.3	25.8	74.8	3.5	0.0	67.3	6.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	41.4	10.2	37.3	25.8	74.8	3.5	0.0	67.3	6.3	0.1
LOS	D	D	B	D	C	E	A	A	E	A	A
Approach Delay		21.6			28.4		8.5			6.5	
Approach LOS		C			C		A			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 61.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	27	154	6	12	10	93	1217	13	10	1086	49
Future Volume (veh/h)	47	27	154	6	12	10	93	1217	13	10	1086	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	51	29	62	7	13	9	101	1323	13	11	1180	53
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	137	126	107	129	69	48	123	2738	1225	21	2522	1103
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.80	0.80	0.03	1.00	1.00
Sat Flow, veh/h	1333	1800	1530	1253	992	687	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	51	29	62	7	0	22	101	1323	13	11	1180	53
Grp Sat Flow(s),veh/h/ln	1333	1800	1530	1253	0	1679	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.5	1.8	4.7	0.6	0.0	1.5	7.4	15.1	0.2	0.8	0.0	0.0
Cycle Q Clear(g_c), s	6.0	1.8	4.7	2.5	0.0	1.5	7.4	15.1	0.2	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	137	126	107	129	0	118	123	2738	1225	21	2522	1103
V/C Ratio(X)	0.37	0.23	0.58	0.05	0.00	0.19	0.82	0.48	0.01	0.53	0.47	0.05
Avail Cap(c_a), veh/h	510	630	535	479	0	588	175	2738	1225	67	2522	1103
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	55.4	52.7	54.1	53.9	0.0	52.6	54.7	3.9	2.4	58.1	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.7	3.6	0.1	0.0	0.6	16.3	0.6	0.0	11.9	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.9	2.1	0.2	0.0	0.7	3.9	7.2	0.1	0.4	0.2	0.0
LnGrp Delay(d),s/veh	56.6	53.4	57.7	54.0	0.0	53.1	70.9	4.5	2.4	70.0	0.5	0.1
LnGrp LOS	E	D	E	D		D	E	A	A	E	A	A
Approach Vol, veh/h		142			29			1437			1244	
Approach Delay, s/veh		56.4			53.4			9.2			1.1	
Approach LOS		E			D			A			A	

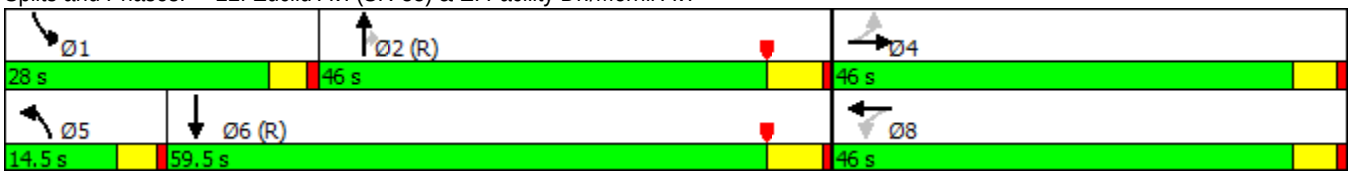
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	101.8		13.2	12.6	94.2		13.2
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.8	17.1		8.0	9.4	2.0		4.5
Green Ext Time (p_c), s	0.0	26.1		0.5	0.0	28.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	20	98	0	2	1256	180	254	970
Future Volume (vph)	5	20	98	0	2	1256	180	254	970
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		20.9		20.9	10.0	59.8	59.8	23.9	85.2
Actuated g/C Ratio		0.17		0.17	0.08	0.50	0.50	0.20	0.71
v/c Ratio		0.13		0.65	0.01	0.79	0.24	0.85	0.43
Control Delay		28.9		30.0	65.0	18.7	4.9	50.1	10.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.9		30.0	65.0	18.7	4.9	50.1	10.9
LOS		C		C	E	B	A	D	B
Approach Delay		28.9		30.0		17.0			19.0
Approach LOS		C		C		B			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	20	11	98	0	101	2	1256	180	254	970	1
Future Volume (veh/h)	5	20	11	98	0	101	2	1256	180	254	970	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	22	4	105	0	81	2	1351	165	273	1043	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	56	196	32	163	5	93	9	1859	814	296	2529	2
Arrive On Green	0.14	0.14	0.14	0.14	0.00	0.14	0.01	0.54	0.54	0.18	0.72	0.72
Sat Flow, veh/h	144	1356	222	806	33	647	1619	3420	1497	1619	3506	3
Grp Volume(v), veh/h	31	0	0	186	0	0	2	1351	165	273	509	535
Grp Sat Flow(s),veh/h/ln	1722	0	0	1486	0	0	1619	1710	1497	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	12.8	0.0	0.0	0.1	35.8	6.8	19.9	14.2	14.2
Cycle Q Clear(g_c), s	1.8	0.0	0.0	14.6	0.0	0.0	0.1	35.8	6.8	19.9	14.2	14.2
Prop In Lane	0.16		0.13	0.56		0.44	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	283	0	0	261	0	0	9	1859	814	296	1233	1298
V/C Ratio(X)	0.11	0.00	0.00	0.71	0.00	0.00	0.23	0.73	0.20	0.92	0.41	0.41
Avail Cap(c_a), veh/h	613	0	0	549	0	0	135	1859	814	317	1233	1298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.39	0.39	0.39	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	50.1	0.0	0.0	59.4	20.7	14.0	48.2	6.6	6.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.4	0.0	0.0	1.9	1.0	0.2	29.1	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	6.1	0.0	0.0	0.1	17.0	2.8	11.3	7.0	7.3
LnGrp Delay(d),s/veh	44.8	0.0	0.0	51.4	0.0	0.0	61.4	21.7	14.3	77.3	7.7	7.6
LnGrp LOS	D			D			E	C	B	E	A	A
Approach Vol, veh/h		31			186			1518			1317	
Approach Delay, s/veh		44.8			51.4			20.9			22.1	
Approach LOS		D			D			C			C	

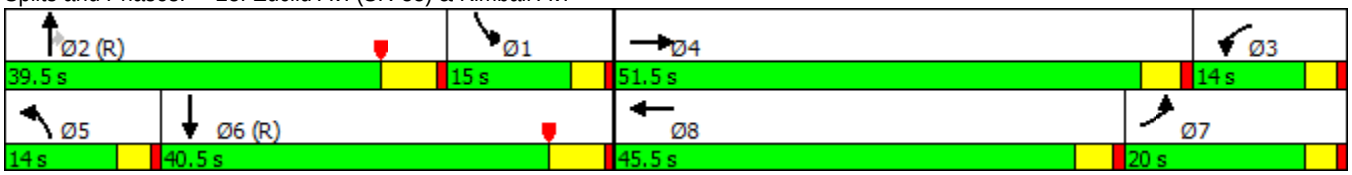
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.5	71.2		22.3	5.1	92.5		22.3
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	21.9	37.8		3.8	2.1	16.2		16.6
Green Ext Time (p_c), s	0.1	2.1		0.7	0.0	22.7		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	23.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	307	815	59	398	66	690	34	349	675
Future Volume (vph)	307	815	59	398	66	690	34	349	675
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	26.3	45.0	14.8	30.7	10.0	30.1	30.1	14.4	37.3
Actuated g/C Ratio	0.22	0.38	0.12	0.26	0.08	0.25	0.25	0.12	0.31
v/c Ratio	0.91	0.71	0.31	0.85	0.51	0.84	0.07	1.89	0.75
Control Delay	76.5	36.3	53.0	39.3	48.2	49.4	2.0	444.8	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.5	36.3	53.0	39.3	48.2	49.4	2.0	444.8	42.4
LOS	E	D	D	D	D	D	A	F	D
Approach Delay		46.8		40.3		47.3			169.6
Approach LOS		D		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.89	
Intersection Signal Delay: 80.1	Intersection LOS: F
Intersection Capacity Utilization 101.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	815	48	59	398	403	66	690	34	349	675	82
Future Volume (veh/h)	307	815	48	59	398	403	66	690	34	349	675	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	320	849	46	61	415	386	69	719	20	364	703	67
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	216	985	53	183	476	426	121	834	373	281	1132	108
Arrive On Green	0.13	0.30	0.30	0.11	0.28	0.28	0.02	0.08	0.08	0.17	0.36	0.36
Sat Flow, veh/h	1619	3300	179	1619	1710	1530	1619	3420	1530	1619	3152	300
Grp Volume(v), veh/h	320	440	455	61	415	386	69	719	20	364	381	389
Grp Sat Flow(s),veh/h/ln	1619	1710	1768	1619	1710	1530	1619	1710	1530	1619	1710	1743
Q Serve(g_s), s	16.0	29.2	29.2	4.2	27.7	29.2	5.1	24.9	1.4	20.8	22.1	22.1
Cycle Q Clear(g_c), s	16.0	29.2	29.2	4.2	27.7	29.2	5.1	24.9	1.4	20.8	22.1	22.1
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	216	510	528	183	476	426	121	834	373	281	614	626
V/C Ratio(X)	1.48	0.86	0.86	0.33	0.87	0.91	0.57	0.86	0.05	1.29	0.62	0.62
Avail Cap(c_a), veh/h	216	670	693	183	584	523	135	955	427	281	614	626
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	0.77	0.77	0.77	0.91	0.91	0.91
Uniform Delay (d), s/veh	52.0	39.8	39.8	49.0	41.2	41.8	56.6	53.2	42.4	49.6	31.7	31.7
Incr Delay (d2), s/veh	234.0	6.6	6.4	0.4	10.2	15.5	1.5	9.1	0.2	154.4	4.2	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.2	14.7	15.2	1.9	14.5	14.2	2.3	12.9	0.6	21.4	11.1	11.3
LnGrp Delay(d),s/veh	286.0	46.3	46.1	49.4	51.4	57.3	58.1	62.3	42.6	204.0	36.0	35.9
LnGrp LOS	F	D	D	D	D	E	E	E	D	F	D	D
Approach Vol, veh/h		1215			862			808			1134	
Approach Delay, s/veh		109.4			53.9			61.5			89.9	
Approach LOS		F			D			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.8	35.2	17.6	40.3	13.0	49.1	20.0	37.9
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	22.8	26.9	6.2	31.2	7.1	24.1	18.0	31.2
Green Ext Time (p_c), s	0.0	2.3	0.2	4.7	0.0	3.4	0.0	2.2

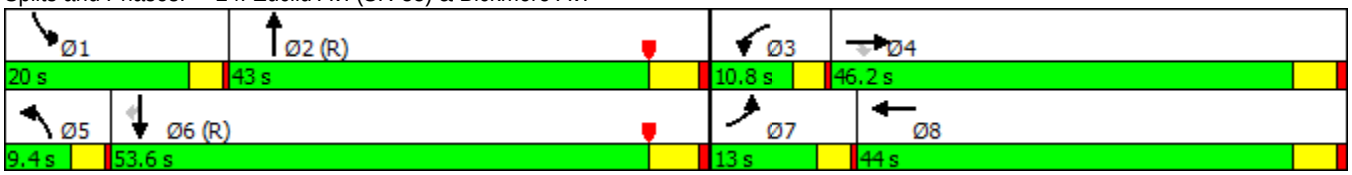
Intersection Summary	
HCM 2010 Ctrl Delay	82.3
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	66	86	45	164	25	15	655	127	565	54
Future Volume (vph)	66	86	45	164	25	15	655	127	565	54
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.0	16.0	16.0	19.3	28.1	5.6	53.3	13.9	66.8	66.8
Actuated g/C Ratio	0.08	0.13	0.13	0.16	0.23	0.05	0.44	0.12	0.56	0.56
v/c Ratio	0.60	0.40	0.16	0.70	0.25	0.23	0.59	0.75	0.33	0.07
Control Delay	74.2	49.2	1.2	64.5	13.7	86.8	9.7	84.2	4.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	49.2	1.2	64.5	13.7	86.8	9.7	84.2	4.7	0.2
LOS	E	D	A	E	B	F	A	F	A	A
Approach Delay		46.6			45.4		11.1		17.9	
Approach LOS		D			D		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	86	45	164	25	74	15	655	138	127	565	54
Future Volume (veh/h)	66	86	45	164	25	74	15	655	138	127	565	54
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	73	96	31	182	28	70	17	728	143	141	628	60
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	91	140	119	98	38	94	29	1748	343	163	2386	1046
Arrive On Green	0.06	0.08	0.08	0.06	0.08	0.08	0.02	0.82	0.82	0.20	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	457	1142	1619	2840	558	1619	3420	1499
Grp Volume(v), veh/h	73	96	31	182	0	98	17	438	433	141	628	60
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1599	1619	1710	1688	1619	1710	1499
Q Serve(g_s), s	5.3	6.2	2.3	7.3	0.0	7.2	1.2	8.5	8.5	10.1	0.0	0.0
Cycle Q Clear(g_c), s	5.3	6.2	2.3	7.3	0.0	7.2	1.2	8.5	8.5	10.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.71	1.00		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	91	140	119	98	0	132	29	1052	1039	163	2386	1046
V/C Ratio(X)	0.81	0.69	0.26	1.85	0.00	0.74	0.58	0.42	0.42	0.87	0.26	0.06
Avail Cap(c_a), veh/h	128	618	525	98	0	520	80	1052	1039	223	2386	1046
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.63	0.63	0.63
Uniform Delay (d), s/veh	56.0	53.9	52.1	56.3	0.0	53.8	58.1	5.0	5.0	47.2	0.0	0.0
Incr Delay (d2), s/veh	14.7	2.2	0.4	417.9	0.0	3.1	0.6	0.1	0.1	12.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.2	1.0	14.7	0.0	3.3	0.6	3.9	3.9	5.0	0.1	0.0
LnGrp Delay(d),s/veh	70.7	56.2	52.5	474.3	0.0	56.9	58.7	5.1	5.1	59.3	0.2	0.1
LnGrp LOS	E	E	D	F		E	E	A	A	E	A	A
Approach Vol, veh/h		200			280			888			829	
Approach Delay, s/veh		60.9			328.2			6.1			10.2	
Approach LOS		E			F			A			B	

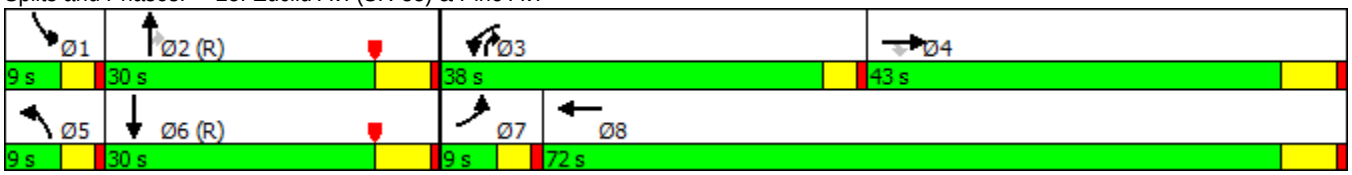
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	79.3	10.8	14.3	5.7	89.2	10.2	14.9
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	12.1	10.5	9.3	8.2	3.2	2.0	7.3	9.2
Green Ext Time (p_c), s	0.1	5.9	0.0	0.7	0.0	6.2	0.0	0.7

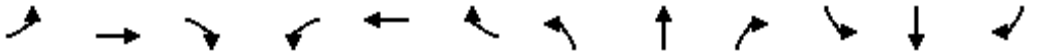
Intersection Summary	
HCM 2010 Ctrl Delay	53.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	14	323	28	445	71	33	705	1022	94	631
Future Volume (vph)	14	323	28	445	71	33	705	1022	94	631
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	28.4	28.4	34.0	62.8	6.2	24.4	64.4	13.2	35.1
Actuated g/C Ratio	0.04	0.24	0.24	0.28	0.52	0.05	0.20	0.54	0.11	0.29
v/c Ratio	0.21	0.78	0.06	0.55	0.13	0.40	1.04	1.13	0.55	0.67
Control Delay	63.1	55.4	0.2	39.5	9.7	69.2	66.0	80.4	53.9	34.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	55.4	0.2	39.5	9.7	69.2	66.0	80.4	53.9	34.2
LOS	E	E	A	D	A	E	E	F	D	C
Approach Delay		51.4			33.5		74.4			36.7
Approach LOS		D			C		E			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 57.2	Intersection LOS: E
Intersection Capacity Utilization 102.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	323	28	445	71	40	33	705	1022	94	631	14
Future Volume (veh/h)	14	323	28	445	71	40	33	705	1022	94	631	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	14	333	0	459	73	35	34	727	621	97	651	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	25	391	332	516	433	208	46	1368	879	67	1425	22
Arrive On Green	0.02	0.22	0.00	0.17	0.38	0.38	0.03	0.40	0.40	0.01	0.14	0.14
Sat Flow, veh/h	1619	1800	1530	2956	1151	552	1619	3420	1530	1619	3446	53
Grp Volume(v), veh/h	14	333	0	459	0	108	34	727	621	97	323	338
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1703	1619	1710	1530	1619	1710	1789
Q Serve(g_s), s	1.0	21.3	0.0	18.2	0.0	5.1	2.5	19.4	34.9	5.0	20.9	20.9
Cycle Q Clear(g_c), s	1.0	21.3	0.0	18.2	0.0	5.1	2.5	19.4	34.9	5.0	20.9	20.9
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	25	391	332	516	0	640	46	1368	879	67	707	740
V/C Ratio(X)	0.56	0.85	0.00	0.89	0.00	0.17	0.74	0.53	0.71	1.44	0.46	0.46
Avail Cap(c_a), veh/h	67	555	472	838	0	936	67	1368	879	67	707	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.92	0.92	0.92
Uniform Delay (d), s/veh	58.7	45.1	0.0	48.4	0.0	24.9	57.9	27.4	18.3	59.2	39.4	39.4
Incr Delay (d2), s/veh	7.0	10.2	0.0	4.4	0.0	0.2	0.9	0.1	0.4	258.6	2.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.7	0.0	7.8	0.0	2.4	1.1	9.2	14.8	7.1	10.3	10.8
LnGrp Delay(d),s/veh	65.6	55.4	0.0	52.8	0.0	25.1	58.8	27.6	18.7	317.8	41.4	41.3
LnGrp LOS	E	E		D		C	E	C	B	F	D	D
Approach Vol, veh/h		347			567			1382			758	
Approach Delay, s/veh		55.8			47.5			24.4			76.7	
Approach LOS		E			D			C			E	

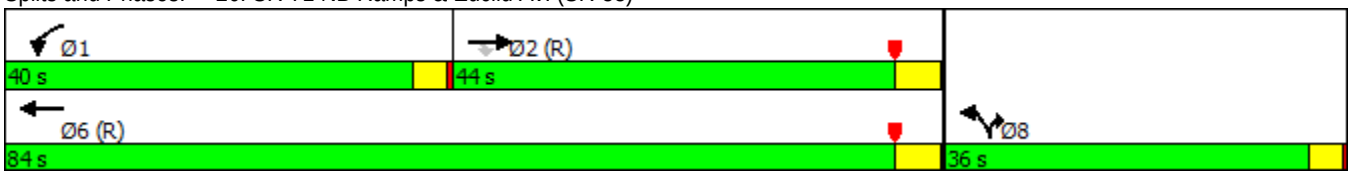
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	54.0	24.9	32.1	7.4	55.6	5.9	51.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	36.9	20.2	23.3	4.5	22.9	3.0	7.1
Green Ext Time (p_c), s	0.0	0.0	0.7	2.7	0.0	0.8	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	45.2
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	744	171	289	862	147	1103
Future Volume (vph)	744	171	289	862	147	1103
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	44.0	44.0	40.0	84.0	36.0	36.0
Total Split (%)	36.7%	36.7%	33.3%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	49.0	49.0	27.0	79.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.22	0.66	0.27	0.27
v/c Ratio	0.59	0.26	0.84	0.42	0.18	1.51
Control Delay	33.3	9.1	66.3	2.6	34.2	257.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	9.1	66.3	2.6	34.2	257.2
LOS	C	A	E	A	C	F
Approach Delay	28.8			18.6	231.1	
Approach LOS	C			B	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.51	
Intersection Signal Delay: 101.5	Intersection LOS: F
Intersection Capacity Utilization 100.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	744	171	289	862	147	1103
Future Volume (veh/h)	744	171	289	862	147	1103
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	827	0	321	958	163	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2162	967	348	2957	229	105
Arrive On Green	1.00	0.00	0.20	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	827	0	321	958	163	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	22.0	6.3	5.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	22.0	6.3	5.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2162	967	348	2957	229	105
V/C Ratio(X)	0.38	0.00	0.92	0.32	0.71	0.00
Avail Cap(c_a), veh/h	2162	967	521	2957	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.76	0.76	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	46.9	1.5	54.7	0.0
Incr Delay (d2), s/veh	0.5	0.0	10.4	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	11.4	3.0	2.8	0.0
LnGrp Delay(d),s/veh	0.5	0.0	57.3	1.8	58.8	0.0
LnGrp LOS	A		E	A	E	
Approach Vol, veh/h	827			1279	163	
Approach Delay, s/veh	0.5			15.7	58.8	
Approach LOS	A			B	E	

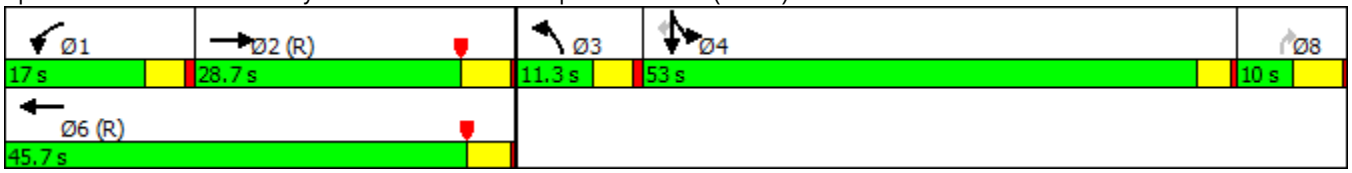
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	27.9	80.4				108.3		11.7
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	36.5	39.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	24.0	2.0				8.3		7.8
Green Ext Time (p_c), s	0.4	12.7				14.1		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	271	97	204	29	15	696	138	150
Future Volume (vph)	271	97	204	29	15	696	138	150
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.7	17.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.9%	14.2%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	38.2	11.7	54.9	6.5	5.0	40.4	40.4	40.4
Actuated g/C Ratio	0.32	0.10	0.46	0.05	0.04	0.34	0.34	0.34
v/c Ratio	0.30	0.64	0.13	0.34	0.08	0.82	0.78	0.25
Control Delay	34.4	61.6	12.6	65.7	0.8	49.5	45.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	61.6	12.6	65.7	0.8	49.5	45.7	4.5
LOS	C	E	B	E	A	D	D	A
Approach Delay	34.4		28.4				41.0	
Approach LOS	C		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 37.5	Intersection LOS: D
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	271	42	97	204	0	29	0	15	696	138	150
Future Volume (veh/h)	0	271	42	97	204	0	29	0	15	696	138	150
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	279	43	100	210	0	30	0	15	819	0	155
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1577	240	121	2196	0	0	0	0	929	0	439
Arrive On Green	0.00	0.53	0.53	0.10	0.85	0.00	0.00	0.00	0.00	0.29	0.00	0.29
Sat Flow, veh/h	0	3066	453	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	159	163	100	210	0		0.0		819	0	155
Grp Sat Flow(s),veh/h/ln	0	1710	1720	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	5.8	5.9	7.3	1.2	0.0				29.0	0.0	9.6
Cycle Q Clear(g_c), s	0.0	5.8	5.9	7.3	1.2	0.0				29.0	0.0	9.6
Prop In Lane	0.00		0.26	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	906	911	121	2196	0				929	0	439
V/C Ratio(X)	0.00	0.18	0.18	0.82	0.10	0.00				0.88	0.00	0.35
Avail Cap(c_a), veh/h	0	906	911	169	2196	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.6	14.7	53.2	3.2	0.0				40.8	0.0	33.9
Incr Delay (d2), s/veh	0.0	0.4	0.4	20.1	0.1	0.0				5.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.8	2.9	3.9	0.6	0.0				13.6	0.0	4.1
LnGrp Delay(d),s/veh	0.0	15.1	15.1	73.3	3.3	0.0				46.0	0.0	34.4
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		322			310						974	
Approach Delay, s/veh		15.1			25.9						44.1	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.5	68.6		37.9		82.1		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	12.5	23.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.3	7.9		31.0		3.2		
Green Ext Time (p_c), s	0.1	1.8		3.5		2.1		

Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↱			↱
Traffic Vol, veh/h	0	352	237	2	0	26
Future Vol, veh/h	0	352	237	2	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	383	258	2	0	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	259
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	785
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	785
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	785
HCM Lane V/C Ratio	-	-	-	0.036
HCM Control Delay (s)	-	-	-	9.8
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	352	218	1	0	20
Future Vol, veh/h	0	352	218	1	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	383	237	1	0	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	238
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	806
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	806
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	806
HCM Lane V/C Ratio	-	-	-	0.027
HCM Control Delay (s)	-	-	-	9.6
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1158	57	4	713	204	15
Future Volume (vph)	1158	57	4	713	204	15
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	72.5	72.5	5.0	74.2	19.1	19.1
Actuated g/C Ratio	0.69	0.69	0.05	0.71	0.18	0.18
v/c Ratio	1.01	0.06	0.05	0.61	0.76	0.05
Control Delay	46.5	3.3	53.5	11.1	57.4	16.0
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	46.5	3.3	53.5	11.4	57.4	16.0
LOS	D	A	D	B	E	B
Approach Delay	44.5			11.6	54.6	
Approach LOS	D			B	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 104.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1158	57	4	713	204	15
Future Volume (veh/h)	1158	57	4	713	204	15
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1259	62	4	775	222	16
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1235	1049	8	1323	255	241
Arrive On Green	0.69	0.69	0.01	0.73	0.16	0.16
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1259	62	4	775	222	16
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	72.1	1.4	0.3	21.1	14.1	0.9
Cycle Q Clear(g_c), s	72.1	1.4	0.3	21.1	14.1	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1235	1049	8	1323	255	241
V/C Ratio(X)	1.02	0.06	0.47	0.59	0.87	0.07
Avail Cap(c_a), veh/h	1235	1049	77	1399	416	393
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.5	5.4	52.1	6.5	43.2	37.7
Incr Delay (d2), s/veh	30.7	0.0	14.3	0.6	10.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	45.8	0.6	0.1	10.5	7.1	0.4
LnGrp Delay(d),s/veh	47.2	5.4	66.4	7.1	54.0	37.8
LnGrp LOS	F	A	E	A	D	D
Approach Vol, veh/h	1321			779	238	
Approach Delay, s/veh	45.2			7.4	52.9	
Approach LOS	D			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.2	78.3				83.5		21.7
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.3	74.1				23.1		16.1
Green Ext Time (p_c), s	0.0	0.0				29.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	33.4
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	21	0	219	59	3
Future Vol, veh/h	0	21	0	219	59	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	23	0	238	64	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	66	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	1003	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	1003	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1003	-	-
HCM Lane V/C Ratio	-	0.023	-	-
HCM Control Delay (s)	-	8.7	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	58	161	1	16	63
Future Vol, veh/h	5	58	161	1	16	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	63	175	1	17	68

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	279	176	0	0	176	0
Stage 1	176	-	-	-	-	-
Stage 2	103	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	715	872	-	-	1412	-
Stage 1	859	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	706	872	-	-	1412	-
Mov Cap-2 Maneuver	725	-	-	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	858	1412	-
HCM Lane V/C Ratio	-	-	0.08	0.012	-
HCM Control Delay (s)	-	-	9.6	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	18	145	1	5	64
Future Vol, veh/h	5	18	145	1	5	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	20	158	1	5	70

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	238	158	0	0	159	0
Stage 1	158	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	755	893	-	-	1433	-
Stage 1	875	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	752	893	-	-	1433	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	944	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	859	1433	-
HCM Lane V/C Ratio	-	-	0.029	0.004	-
HCM Control Delay (s)	-	-	9.3	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	10	3	142	67	1
Future Vol, veh/h	5	10	3	142	67	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	11	3	154	73	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	234	73	74	0	-	0
Stage 1	73	-	-	-	-	-
Stage 2	161	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	759	995	1538	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	757	995	1538	-	-	-
Mov Cap-2 Maneuver	757	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1538	-	901	-	-
HCM Lane V/C Ratio	0.002	-	0.018	-	-
HCM Control Delay (s)	7.3	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	140	2	1	76
Future Vol, veh/h	5	5	140	2	1	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	5	152	2	1	83

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	238	153	0	0	154	0
Stage 1	153	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	755	898	-	-	1439	-
Stage 1	880	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	754	898	-	-	1439	-
Mov Cap-2 Maneuver	757	-	-	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	942	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	821	1439	-
HCM Lane V/C Ratio	-	-	0.013	0.001	-
HCM Control Delay (s)	-	-	9.4	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	10	9	111	73	8
Future Vol, veh/h	30	10	9	111	73	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	11	10	121	79	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	224	84	88	0	-	0
Stage 1	84	-	-	-	-	-
Stage 2	140	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	769	981	1520	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	764	981	1520	-	-	-
Mov Cap-2 Maneuver	764	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	886	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1520	-	809	-	-
HCM Lane V/C Ratio	0.006	-	0.054	-	-
HCM Control Delay (s)	7.4	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	10	3	84	76	7
Future Vol, veh/h	35	10	3	84	76	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	38	11	3	91	83	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	184	86	90	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	98	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	810	978	1518	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	808	978	1518	-	-	-
Mov Cap-2 Maneuver	796	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	929	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1518	-	830	-	-
HCM Lane V/C Ratio	0.002	-	0.059	-	-
HCM Control Delay (s)	7.4	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	10	3	57	77	9
Future Vol, veh/h	30	10	3	57	77	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	11	3	62	84	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	157	89	93	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	814	975	1514	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	975	1514	-	-	-
Mov Cap-2 Maneuver	796	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	945	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	834	-	-
HCM Lane V/C Ratio	0.002	-	0.052	-	-
HCM Control Delay (s)	7.4	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	8	2	50	84	3
Future Vol, veh/h	10	8	2	50	84	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	9	2	54	91	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	152	93	95	0	-	0
Stage 1	93	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	844	970	1512	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	843	970	1512	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1512	-	879	-	-
HCM Lane V/C Ratio	0.001	-	0.022	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	35	14	34	87	5
Future Vol, veh/h	18	35	14	34	87	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	20	38	15	37	95	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	164	97	100	0	-	0
Stage 1	97	-	-	-	-	-
Stage 2	67	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	831	965	1505	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	961	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	823	965	1505	-	-	-
Mov Cap-2 Maneuver	805	-	-	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1505	-	904	-	-
HCM Lane V/C Ratio	0.01	-	0.064	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	9	38	119	3
Future Vol, veh/h	10	10	9	38	119	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	11	10	41	129	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	192	131	133	0	-	0
Stage 1	131	-	-	-	-	-
Stage 2	61	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	801	924	1464	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	967	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	795	924	1464	-	-	-
Mov Cap-2 Maneuver	784	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	960	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1464	-	848	-	-
HCM Lane V/C Ratio	0.007	-	0.026	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	310	121	6	30	99
Future Vol, veh/h	42	310	121	6	30	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	46	337	132	7	33	108

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	132	0	-	0	560	132
Stage 1	-	-	-	-	132	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1466	-	-	-	493	923
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1466	-	-	-	478	923
Mov Cap-2 Maneuver	-	-	-	-	593	-
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1466	-	-	-	593	923
HCM Lane V/C Ratio	0.031	-	-	-	0.055	0.117
HCM Control Delay (s)	7.5	-	-	-	11.4	9.4
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.4

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1166	7	0	717	0	25
Future Vol, veh/h	1166	7	0	717	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1267	8	0	779	0	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	634
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	427
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	427
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

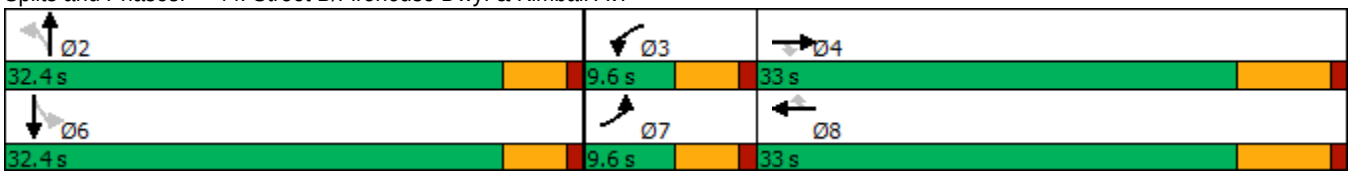
Approach	EB	WB	NB
HCM Control Delay, s	0	0	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	427	-	-	-
HCM Lane V/C Ratio	0.064	-	-	-
HCM Control Delay (s)	14	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations								
Traffic Volume (vph)	1120	71	21	426	291	0		
Future Volume (vph)	1120	71	21	426	291	0		
Turn Type	NA	Perm	Prot	NA	Perm	NA		
Protected Phases	4		3	8		2	6	7
Permitted Phases		4			2			
Detector Phase	4	4	3	8	2	2		
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	23.2	23.2	9.6	16.2	31.6	31.6	14.6	9.6
Total Split (s)	33.0	33.0	9.6	33.0	32.4	32.4	32.4	9.6
Total Split (%)	44.0%	44.0%	12.8%	44.0%	43.2%	43.2%	43%	13%
Yellow Time (s)	5.2	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		
Total Lost Time (s)	6.2	6.2	4.6	6.2		4.6		
Lead/Lag	Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	None	Min	Min	Min	None
Act Effct Green (s)	24.4	24.4	5.3	25.8		16.3		
Actuated g/C Ratio	0.46	0.46	0.10	0.48		0.30		
v/c Ratio	0.72	0.09	0.13	0.52		0.69		
Control Delay	17.4	3.4	30.5	13.1		19.4		
Queue Delay	0.0	0.0	0.0	0.0		0.0		
Total Delay	17.4	3.4	30.5	13.1		19.4		
LOS	B	A	C	B		B		
Approach Delay	16.6			13.9		19.4		
Approach LOS	B			B		B		

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 53.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1120	71	21	426	0	291	0	28	0	0	0
Future Volume (veh/h)	0	1120	71	21	426	0	291	0	28	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	1179	75	22	448	0	306	0	29	0	0	0
Adj No. of Lanes	1	2	1	1	1	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	1482	630	42	938	797	500	0	36	0	510	0
Arrive On Green	0.00	0.41	0.41	0.03	0.52	0.00	0.28	0.00	0.28	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	1800	1530	1322	0	125	0	1800	0
Grp Volume(v), veh/h	0	1179	75	22	448	0	335	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1447	0	0	0	1800	0
Q Serve(g_s), s	0.0	15.8	1.7	0.7	8.8	0.0	11.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	15.8	1.7	0.7	8.8	0.0	11.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.91		0.09	0.00		0.00
Lane Grp Cap(c), veh/h	3	1482	630	42	938	797	535	0	0	0	510	0
V/C Ratio(X)	0.00	0.80	0.12	0.52	0.48	0.00	0.63	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	146	1746	742	146	938	797	853	0	0	0	906	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	14.2	10.1	26.6	8.4	0.0	18.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.3	0.1	3.7	0.4	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.2	0.7	0.4	4.3	0.0	4.9	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	16.5	10.1	30.3	8.8	0.0	19.7	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		B	B	C	A		B					
Approach Vol, veh/h		1254			470			335			0	
Approach Delay, s/veh		16.1			9.8			19.7			0.0	
Approach LOS		B			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		20.3	6.0	29.0		20.3	0.0	35.0
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		27.8	5.0	26.8		27.8	5.0	26.8
Max Q Clear Time (g_c+I1), s		13.9	2.7	17.8		0.0	0.0	10.8
Green Ext Time (p_c), s		1.7	0.0	4.9		0.0	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	46	0	0	0	0	36	0	237	0	12	67	13
Future Vol, veh/h	46	0	0	0	0	36	0	237	0	12	67	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	50	0	0	0	0	39	0	258	0	13	73	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	383	364	80	364	371	258	87	0	0	258	0	0
Stage 1	106	106	-	258	258	-	-	-	-	-	-	-
Stage 2	277	258	-	106	113	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	579	567	986	596	562	786	1522	-	-	1318	-	-
Stage 1	905	811	-	751	698	-	-	-	-	-	-	-
Stage 2	734	698	-	905	806	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	546	561	986	591	556	786	1522	-	-	1318	-	-
Mov Cap-2 Maneuver	546	561	-	591	556	-	-	-	-	-	-	-
Stage 1	905	803	-	751	698	-	-	-	-	-	-	-
Stage 2	697	698	-	896	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	9.8	0	1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1522	-	-	546	786	1318	-	-
HCM Lane V/C Ratio	-	-	-	0.092	0.05	0.01	-	-
HCM Control Delay (s)	0	-	-	12.3	9.8	7.8	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	0	0	232	66	1
Future Vol, veh/h	5	0	0	232	66	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	0	252	72	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	324	72	73	0	-	0
Stage 1	72	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	674	996	1540	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	674	996	1540	-	-	-
Mov Cap-2 Maneuver	674	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	795	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1540	-	674	-	-
HCM Lane V/C Ratio	-	-	0.008	-	-
HCM Control Delay (s)	0	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	146	86	0	41	25
Future Vol, veh/h	0	146	86	0	41	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	159	93	0	45	27

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	209	93	0	0	93	0
Stage 1	93	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	784	970	-	-	1514	-
Stage 1	936	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	760	970	-	-	1514	-
Mov Cap-2 Maneuver	760	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	887	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	970	1514	-
HCM Lane V/C Ratio	-	-	0.164	0.029	-
HCM Control Delay (s)	-	-	9.4	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1143	4	0	448	0	20
Future Vol, veh/h	1143	4	0	448	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1242	4	0	487	0	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	621
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	435
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	435
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	435	-	-	-
HCM Lane V/C Ratio	0.05	-	-	-
HCM Control Delay (s)	13.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1129	44	2	420	13	5
Future Vol, veh/h	1129	44	2	420	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1214	47	2	452	14	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1261	0	1694	631
Stage 1	-	-	-	-	1238	-
Stage 2	-	-	-	-	456	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	558	-	94	429
Stage 1	-	-	-	-	241	-
Stage 2	-	-	-	-	643	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	558	-	94	429
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	241	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	19.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	221	429	-	-	558	-
HCM Lane V/C Ratio	0.063	0.013	-	-	0.004	-
HCM Control Delay (s)	22.4	13.5	-	-	11.5	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1011	18	348	74	8
Future Volume (vph)	1011	18	348	74	8
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	22.3	5.2	23.8	10.4	10.4
Actuated g/C Ratio	0.49	0.11	0.52	0.23	0.23
v/c Ratio	0.72	0.10	0.39	0.21	0.02
Control Delay	12.3	23.8	7.4	19.6	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	23.8	7.4	19.6	12.2
LOS	B	C	A	B	B
Approach Delay	12.3		8.2	18.9	
Approach LOS	B		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 45.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 51.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1011	123	18	348	74	8
Future Volume (veh/h)	1011	123	18	348	74	8
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1064	129	19	366	78	6
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1420	172	37	1040	323	305
Arrive On Green	0.46	0.46	0.02	0.58	0.20	0.20
Sat Flow, veh/h	3151	371	1619	1800	1619	1530
Grp Volume(v), veh/h	594	599	19	366	78	6
Grp Sat Flow(s),veh/h/ln	1710	1722	1619	1800	1619	1530
Q Serve(g_s), s	14.5	14.5	0.6	5.5	2.1	0.2
Cycle Q Clear(g_c), s	14.5	14.5	0.6	5.5	2.1	0.2
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	793	799	37	1040	323	305
V/C Ratio(X)	0.75	0.75	0.51	0.35	0.24	0.02
Avail Cap(c_a), veh/h	975	982	163	1371	323	305
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	24.5	5.7	17.1	16.3
Incr Delay (d2), s/veh	2.6	2.6	3.9	0.2	1.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	7.4	0.3	2.7	1.1	0.1
LnGrp Delay(d),s/veh	13.7	13.7	28.4	5.9	18.8	16.4
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	1193			385	84	
Approach Delay, s/veh	13.7			7.0	18.7	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	29.7				35.5		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	2.6	16.5				7.5		4.1
Green Ext Time (p_c), s	0.0	7.0				11.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.4
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	937	33	299	67	21
Future Volume (vph)	937	33	299	67	21
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	22.2	5.6	25.5	10.5	10.5
Actuated g/C Ratio	0.47	0.12	0.54	0.22	0.22
v/c Ratio	0.72	0.18	0.33	0.20	0.07
Control Delay	13.7	25.7	6.4	21.1	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	25.7	6.4	21.1	13.8
LOS	B	C	A	C	B
Approach Delay	13.7		8.3	19.3	
Approach LOS	B		A	B	

Intersection Summary		
Cycle Length: 60		
Actuated Cycle Length: 47.3		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.72		
Intersection Signal Delay: 12.8	Intersection LOS: B	
Intersection Capacity Utilization 48.6%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	937	116	33	299	67	21
Future Volume (veh/h)	937	116	33	299	67	21
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1008	125	35	322	72	17
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1373	170	62	1045	326	308
Arrive On Green	0.45	0.45	0.04	0.58	0.20	0.20
Sat Flow, veh/h	3144	378	1619	1800	1619	1530
Grp Volume(v), veh/h	564	569	35	322	72	17
Grp Sat Flow(s),veh/h/ln	1710	1722	1619	1800	1619	1530
Q Serve(g_s), s	13.4	13.5	1.1	4.5	1.8	0.4
Cycle Q Clear(g_c), s	13.4	13.5	1.1	4.5	1.8	0.4
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	769	774	62	1045	326	308
V/C Ratio(X)	0.73	0.73	0.56	0.31	0.22	0.06
Avail Cap(c_a), veh/h	989	996	193	1422	326	308
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	23.4	5.3	16.6	16.0
Incr Delay (d2), s/veh	2.1	2.1	2.9	0.2	1.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.8	0.5	2.3	1.0	0.2
LnGrp Delay(d),s/veh	13.3	13.3	26.3	5.5	18.1	16.3
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	1133			357	89	
Approach Delay, s/veh	13.3			7.5	17.8	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.5	28.5				35.0		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.1	15.5				6.5		3.8
Green Ext Time (p_c), s	0.0	6.8				10.3		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	91	829	39	13	254	22	20	6	9	52	17	58
Future Vol, veh/h	91	829	39	13	254	22	20	6	9	52	17	58
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	97	882	41	14	270	23	21	6	10	55	18	62

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	294	0	0	927	0	0	1449	1421	466	948	1431	282
Stage 1	-	-	-	-	-	-	1100	1100	-	310	310	-
Stage 2	-	-	-	-	-	-	349	321	-	638	1121	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1279	-	-	746	-	-	102	138	549	230	136	762
Stage 1	-	-	-	-	-	-	230	290	-	705	663	-
Stage 2	-	-	-	-	-	-	671	655	-	436	284	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1279	-	-	746	-	-	81	125	547	205	123	762
Mov Cap-2 Maneuver	-	-	-	-	-	-	165	211	-	298	204	-
Stage 1	-	-	-	-	-	-	212	267	-	652	651	-
Stage 2	-	-	-	-	-	-	588	643	-	386	261	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.4	25.7	19.6
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	211	1279	-	-	746	-	-	380
HCM Lane V/C Ratio	0.176	0.076	-	-	0.019	-	-	0.356
HCM Control Delay (s)	25.7	8	-	-	9.9	-	-	19.6
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-	-	1.6

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	850	40	18	266	22	12
Future Vol, veh/h	850	40	18	266	22	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	966	45	20	302	25	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1011	0	1332	506
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	694	-	160	517
Stage 1	-	-	-	-	325	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	694	-	155	517
Mov Cap-2 Maneuver	-	-	-	-	297	-
Stage 1	-	-	-	-	325	-
Stage 2	-	-	-	-	702	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	349	-	-	694	-
HCM Lane V/C Ratio	0.111	-	-	0.029	-
HCM Control Delay (s)	16.6	-	-	10.3	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	62.8
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	861	0	0	0	0	0	284	0	0
Future Vol, veh/h	0	0	0	861	0	0	0	0	0	284	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	926	0	0	0	0	0	305	0	0
Number of Lanes	0	0	0	1	0	0	0	0	0	1	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay	78.4	15.6
HCM LOS	F	C

Lane	NBLn1	EBLn1
Vol Left, %	100%	0%
Vol Thru, %	0%	0%
Vol Right, %	0%	100%
Sign Control	Stop	Stop
Traffic Vol by Lane	284	861
LT Vol	284	0
Through Vol	0	0
RT Vol	0	861
Lane Flow Rate	305	926
Geometry Grp	1	1
Degree of Util (X)	0.512	1.092
Departure Headway (Hd)	6.25	4.248
Convergence, Y/N	Yes	Yes
Cap	580	852
Service Time	4.25	2.301
HCM Lane V/C Ratio	0.526	1.087
HCM Control Delay	15.6	78.4
HCM Lane LOS	C	F
HCM 95th-tile Q	2.9	23.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	0	0
Future Vol, veh/h	0	0	0	0
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	0	0
Number of Lanes	0	0	0	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

APPENDIX 5.4:

E+P (PHASE 1) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	E+P Phase 1
				CALC CHS	DATE 09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE 09/06/16
Major Street: **Kimball Av.**				Critical Approach Speed (Major)	50 mph
Minor Street: **Mayhew Av.**				Critical Approach Speed (Minor)	35 mph

Major Street Approach Lanes = **2** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **20,018** vpd Minor Street Future ADT = **933** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. √

or **RURAL (R)**

In built up area of isolated community of < 10,000 population ……..

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 / *1*	8,000	5,600	2,400	1,680
2 + **20,018** / *1* **933**	9,600	6,720 *	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Urban	Rural	Urban	Rural
Satisfied: XX / Not Satisfied				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 / *1*	12,000	8,400	1,200	850
2 + **20,018** / *1* **933**	14,400	10,080 *	1,200	850 *
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 56% B: 100%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 1
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 6				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,903** vpd

Minor Street Future ADT = **95** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,903**	*1* **95**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,903**	*1* **95**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	E+P Phase 1
				CALC CHS	DATE 09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE 09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)	35 mph
Minor Street: **Driveway 8**				Critical Approach Speed (Minor)	15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,652** vpd Minor Street Future ADT = **345** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **1,652** / *1* **345**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **1,652** / *1* **345**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied (XX)	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 14% B: 14%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 1
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 9**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,271** vpd Minor Street Future ADT = **261** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
XX	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street: 1 **1,271** / Minor Street: 1 **261**	8,000	5,600	2,400	1,680
Major Street: 2 + / Minor Street: 1	9,600	6,720	2,400	1,680
Major Street: 2 + / Minor Street: 2 +	9,600	6,720	3,200	2,240
Major Street: 1 / Minor Street: 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach				
Major Street: 1 **1,271** / Minor Street: 1 **261**	12,000	8,400	1,200	850
Major Street: 2 + / Minor Street: 1	14,400	10,080	1,200	850
Major Street: 2 + / Minor Street: 2 +	14,400	10,080	1,600	1,120
Major Street: 1 / Minor Street: 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX				
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 11% B: 11%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 1
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 10				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **897** vpd Minor Street Future ADT = **265** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
XX / Satisfied / Not Satisfied XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **897** / *1* **265**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic				
Satisfied / Not Satisfied XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **897** / *1* **265**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied XX				
No one condition satisfied, but following conditions fulfilled 80% of more ….. A 11% B 7%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	E+P Phase 1
				CALC CHS	DATE 09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE 09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)	35 mph
Minor Street: **Driveway 11**				Critical Approach Speed (Minor)	15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **625** vpd Minor Street Future ADT = **123** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
XX	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **625** / *1* **123**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **625** / *1* **123**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. **A** 5% **B** 5%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 1
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Bickmore Av.				Critical Approach Speed (Major)		40 mph
Minor Street: Mayhew Av.				Critical Approach Speed (Minor)		35 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **5,715** vpd

Minor Street Future ADT = **268** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX / XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **5,715** / 1 **268**	8,000	5,600	2,400	1,680
2 + / 1	9,600	6,720	2,400	1,680
2 + / 2 +	9,600	6,720	3,200	2,240
1 / 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **5,715** / 1 **268**	12,000	8,400	1,200	850
2 + / 1	14,400	10,080	1,200	850
2 + / 2 +	14,400	10,080	1,600	1,120
1 / 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 11% B: 22%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

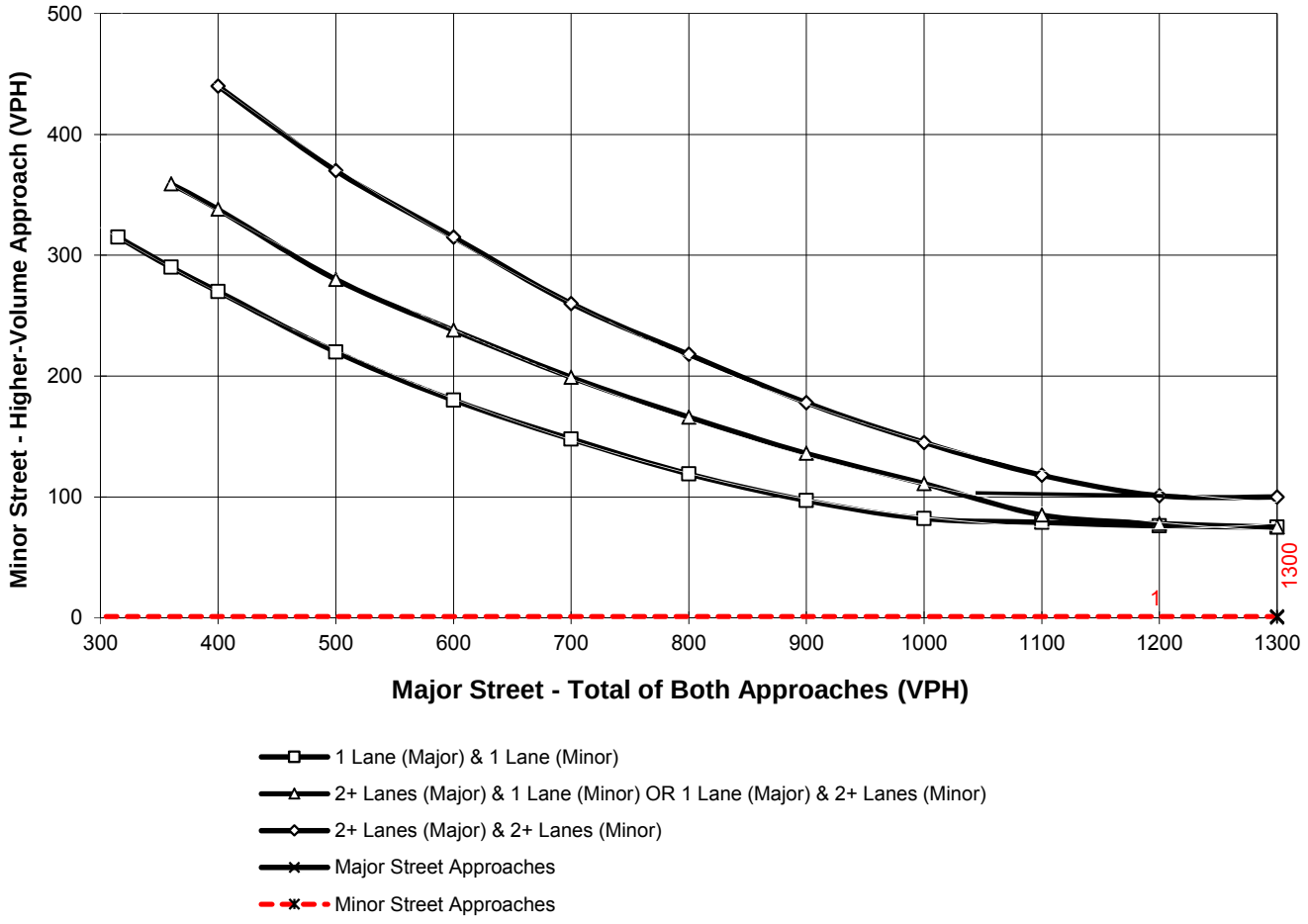
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Phase 1 Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.**
Total of Both Approaches (VPH) = **1444**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Fire Station Dwy.**
High Volume Approach (VPH) = **1**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

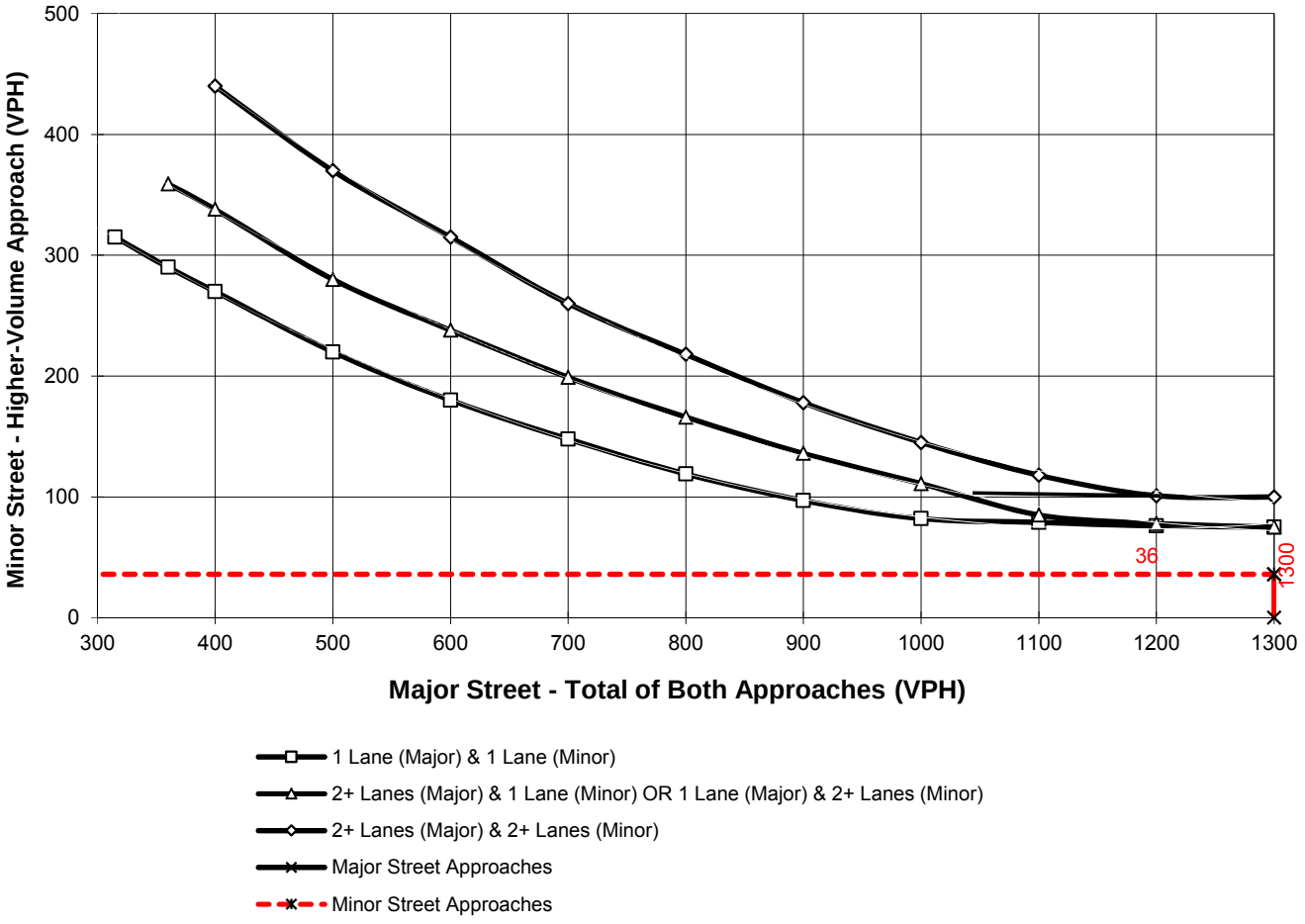
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Phase 1 Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1480**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Rincon Meadows Av.** High Volume Approach (VPH) = **36**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

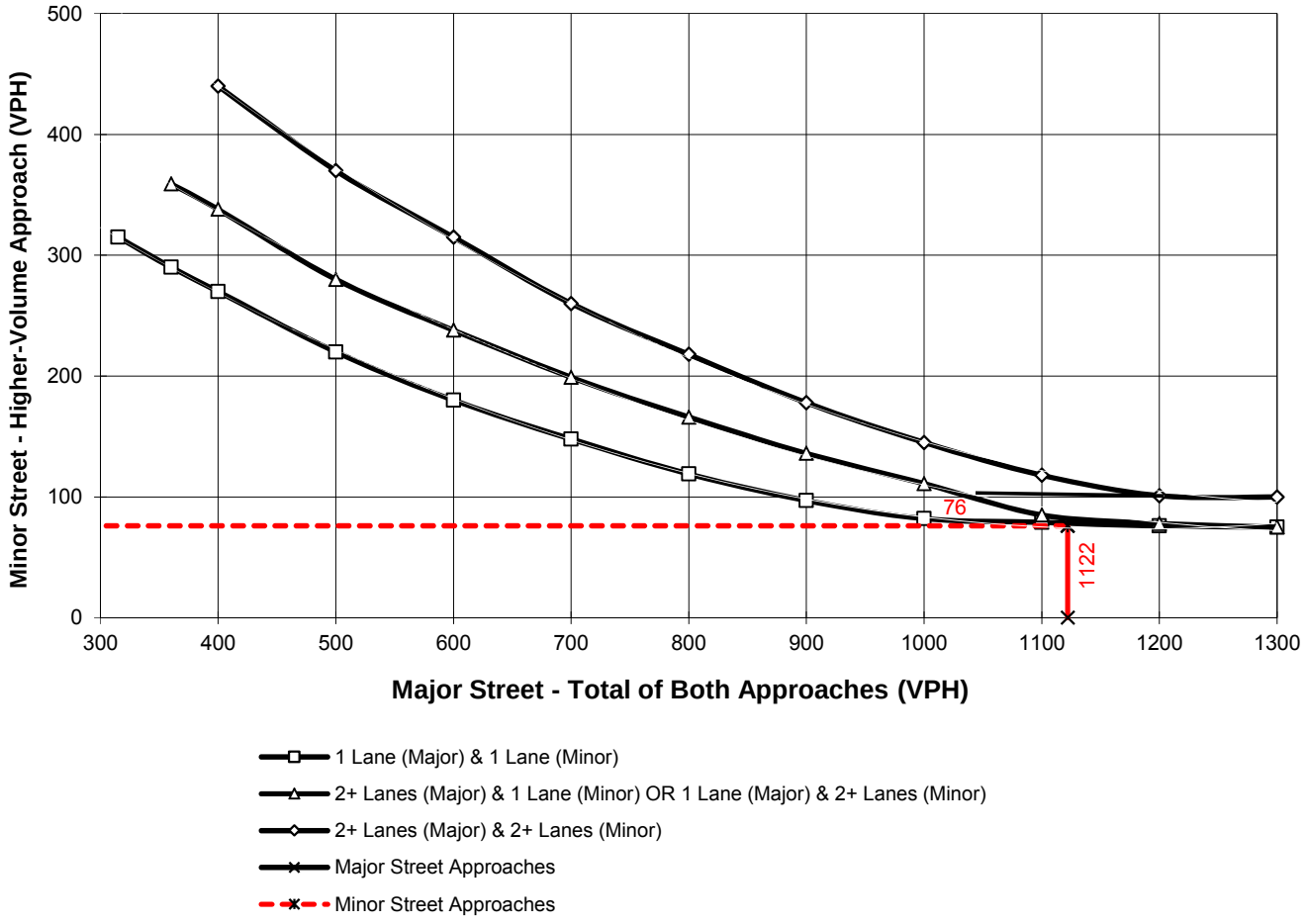
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Phase 1 Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1122**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Meadow Valley Av.** High Volume Approach (VPH) = **76**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 5.5:

E+P (PHASE 2) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	E+P Phase 2
				CALC CHS	DATE 06/12/17
Jurisdiction: **City of Chino**				CHK CHS	DATE 06/12/17
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)	35 mph
Minor Street: **Driveway 5**				Critical Approach Speed (Minor)	15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,402** vpd Minor Street Future ADT = **185** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied: XX / XX				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **2,402** / 1 **185**	8,000	5,600	2,400	1,680
2 + / 1	9,600	6,720	2,400	1,680
2 + / 2 +	9,600	6,720	3,200	2,240
1 / 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach: Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **2,402** / 1 **185**	12,000	8,400	1,200	850
2 + / 1	14,400	10,080	1,200	850
2 + / 2 +	14,400	10,080	1,600	1,120
1 / 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 8% B: 15%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		E+P Phase 2
				CALC	CHS	DATE	06/12/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/12/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 6				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,186** vpd Minor Street Future ADT = **124** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,186**	*1* **124**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,186**	*1* **124**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 5% **B** 10%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		E+P Phase 2
				CALC	CHS	DATE	06/12/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/12/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 7				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,078** vpd Minor Street Future ADT = **77** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …… [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,078**	1 **77**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,078**	1 **77**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 3% **B** 6%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 2	
				CALC	CHS	DATE	06/12/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/12/17
Major Street:	Mayhew Av.			Critical Approach Speed (Major)		35	mph
Minor Street:	Driveway 8			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,886** vpd

Minor Street Future ADT = **425** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,886**	*1* **425**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,886**	*1* **425**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 18% **B** 16%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 2	
				CALC	CHS	DATE	06/12/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/12/17
Major Street:	Mayhew Av.			Critical Approach Speed (Major)		35	mph
Minor Street:	Driveway 9			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,646** vpd

Minor Street Future ADT = **313** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,646**	*1* **313**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,646**	*1* **313**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 13% **B** 14%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM				
				TRAFFIC CONDITIONS		**E+P Phase 2**	
				CALC	CHS	DATE	06/12/17
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	06/12/17
Major Street:	**Mayhew Av.**			Critical Approach Speed (Major)		35	mph
Minor Street:	**Driveway 10**			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,406** vpd

Minor Street Future ADT = **336** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,406**	*1* **336**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,406**	*1* **336**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 14% **B** 12%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		E+P Phase 2
				CALC	CHS	DATE	06/12/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/12/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 11				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,180** vpd Minor Street Future ADT = **152** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,180**	*1* **152**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,180**	*1* **152**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 6% **B** 10%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM				
				TRAFFIC CONDITIONS		**E+P Phase 2**	
				CALC	CHS	DATE	06/12/17
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	06/12/17
Major Street:	**Bickmore Av.**			Critical Approach Speed (Major)		40	mph
Minor Street:	**Mayhew Av.**			Critical Approach Speed (Minor)		35	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **6,012** vpd

Minor Street Future ADT = **565** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **6,012**	*1* **565**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **6,012**	*1* **565**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied	2 CONDITIONS 80%		2 CONDITIONS 80%	
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 24% **B** 47%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

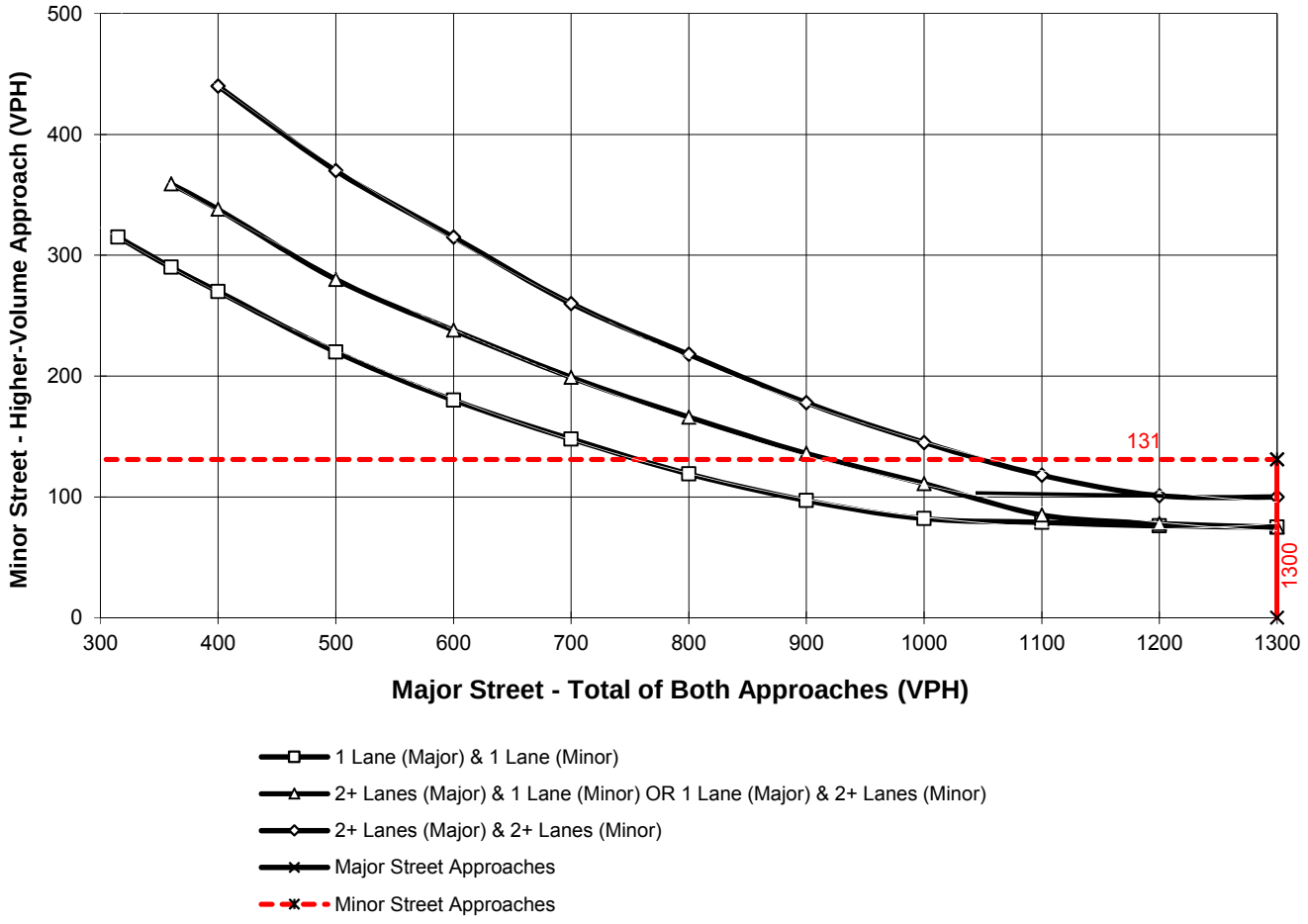
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Phase 2 Conditions - Weekday PM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1544**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Street B/Fire Station Dwy.** High Volume Approach (VPH) = **131**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

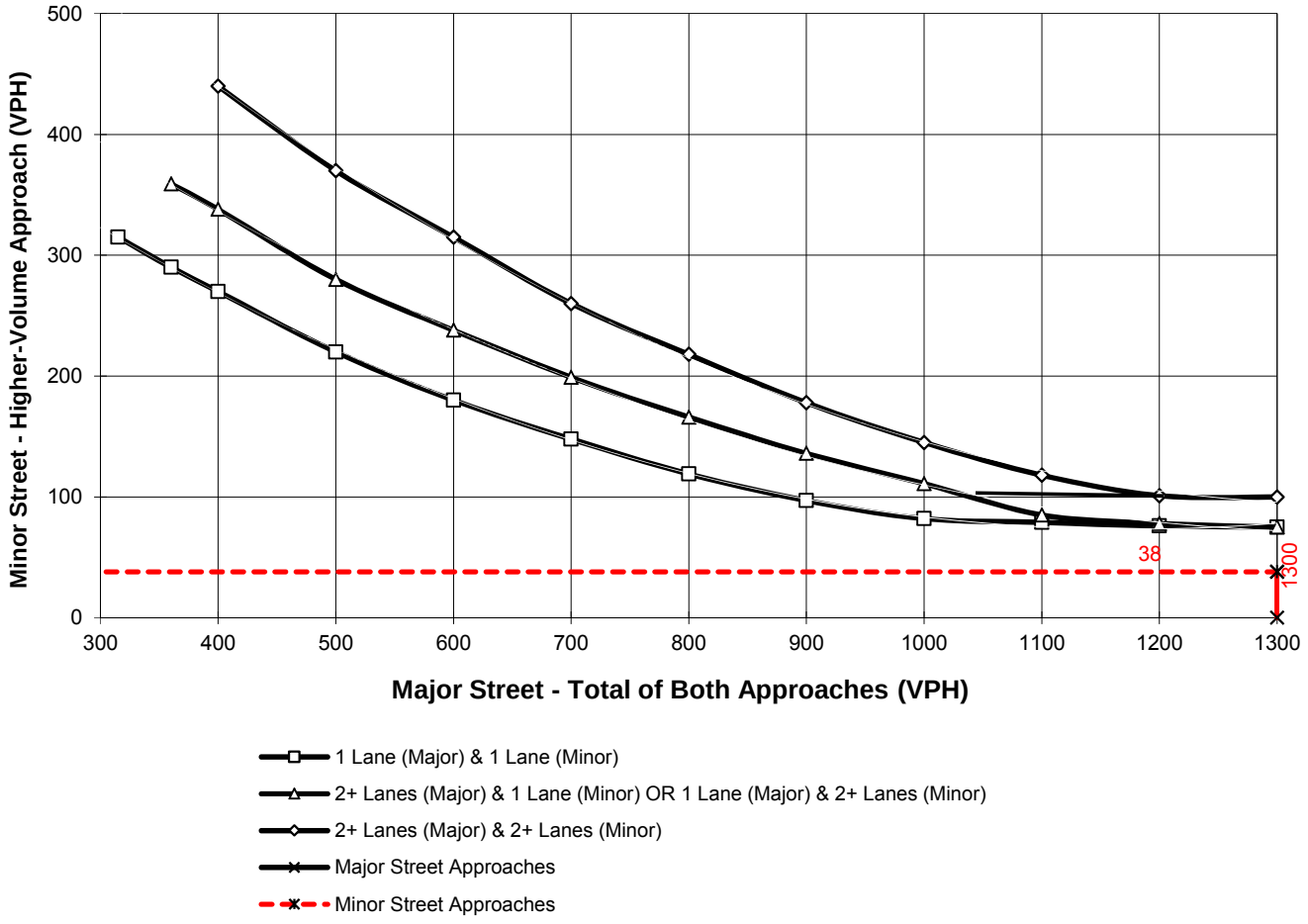
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Phase 2 Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1514**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Rincon Meadows Av.** High Volume Approach (VPH) = **38**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

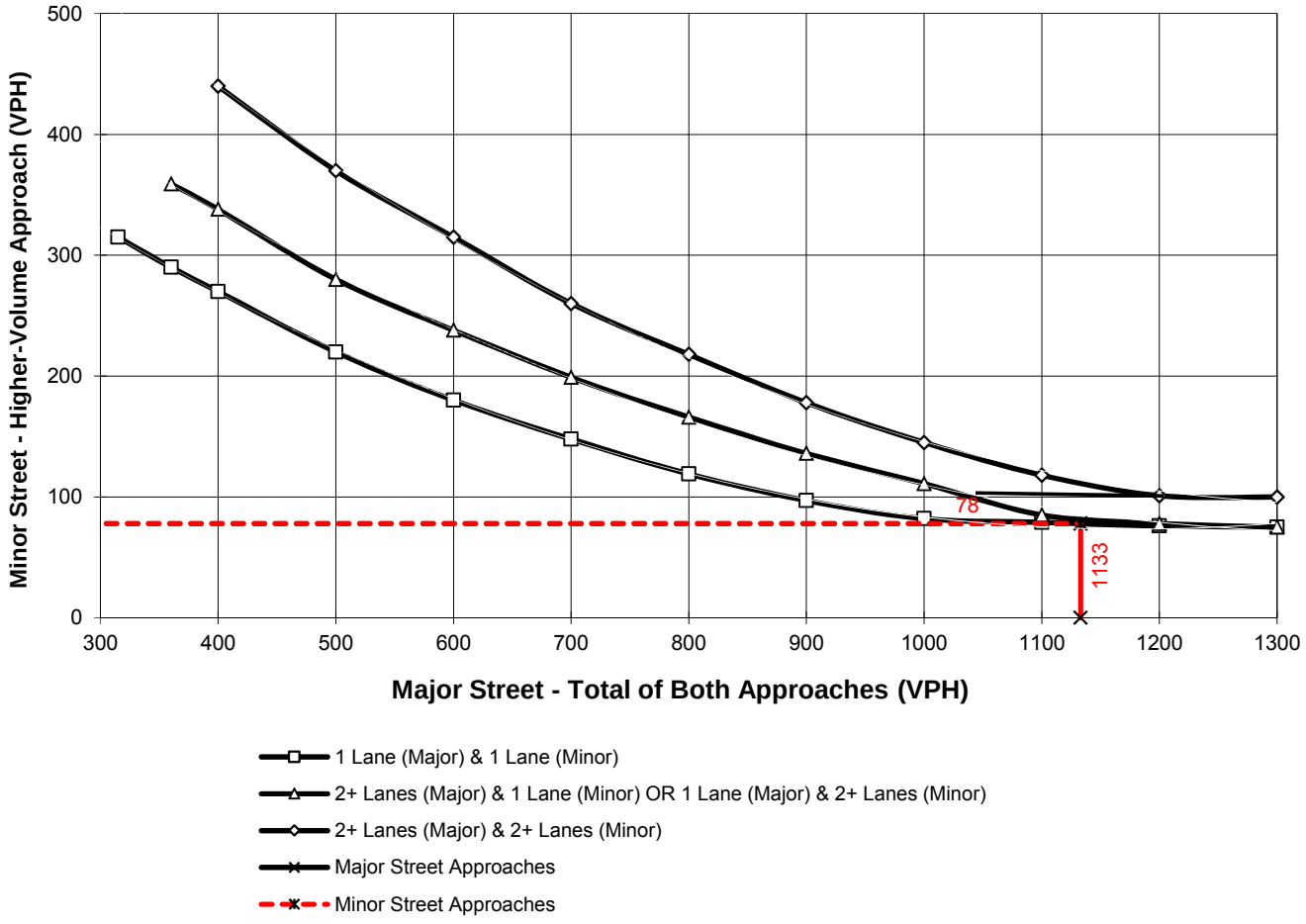
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Phase 2 Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1133**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Meadow Valley Av.** High Volume Approach (VPH) = **78**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 5.6:

E+P (PROJECT BUILDOUT) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.			Critical Approach Speed (Major)		35	mph
Minor Street:	Driveway 4			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **2,382** vpd Minor Street Future ADT = **373** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
CONDITION A - Minimum Vehicular Volume	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied (XX)	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **2,382** / 1 **373**	8,000	5,600	2,400	1,680
2 + / 1	9,600	6,720	2,400	1,680
2 + / 2 +	9,600	6,720	3,200	2,240
1 / 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied (XX)	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **2,382** / 1 **373**	12,000	8,400	1,200	850
2 + / 1	14,400	10,080	1,200	850
2 + / 2 +	14,400	10,080	1,600	1,120
1 / 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied (XX)	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A 16% B 20%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM				
___	___	___	___	TRAFFIC CONDITIONS		**E+P Phase 3**	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	09/06/16
Major Street:	**Mayhew Av.**			Critical Approach Speed (Major)		35	mph
Minor Street:	**Driveway 5**			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,992** vpd

Minor Street Future ADT = **136** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,992**	*1* **136**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,992**	*1* **136**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 6% **B** 11%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM				
___	___	___	___	TRAFFIC CONDITIONS		**E+P Phase 3**	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	09/06/16
Major Street:	**Mayhew Av.**			Critical Approach Speed (Major)		35	mph
Minor Street:	**Driveway 6**			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,949** vpd

Minor Street Future ADT = **93** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,949**	*1* **93**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,949**	*1* **93**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.			Critical Approach Speed (Major)		35	mph
Minor Street:	Driveway 7			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,980** vpd Minor Street Future ADT = **63** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …… [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,980**	*1* **63**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,980**	*1* **63**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 3% **B** 5%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.			Critical Approach Speed (Major)		35	mph
Minor Street:	Driveway 8			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,923** vpd Minor Street Future ADT = **301** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,923**	*1* **301**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,923**	*1* **301**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 13% **B** 16%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.			Critical Approach Speed (Major)		35	mph
Minor Street:	Driveway 9			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,744** vpd

Minor Street Future ADT = **243** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Number of lanes for moving traffic on each approach		Minimum Requirements EADT			
			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Major Street	Minor Street	Urban	Rural	Urban	Rural
XX	1 **1,744**	1 **243**	8,000	5,600	2,400	1,680
CONDITION A - Minimum Vehicular Volume	2 +	1	9,600	6,720	2,400	1,680
Satisfied	2 +	2 +	9,600	6,720	3,200	2,240
Not Satisfied XX	1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied XX	Major Street	Minor Street	Urban	Rural	Urban	Rural
	1 **1,744**	1 **243**	12,000	8,400	1,200	850
	2 +	1	14,400	10,080	1,200	850
	2 +	2 +	14,400	10,080	1,600	1,120
	1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B						
Satisfied / Not Satisfied XX			2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A 10%	B 15%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.			Critical Approach Speed (Major)		35	mph
Minor Street:	Driveway 10			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,498** vpd

Minor Street Future ADT = **245** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Number of lanes for moving traffic on each approach		Minimum Requirements EADT			
			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Major Street	Minor Street	Urban	Rural	Urban	Rural
XX	1 **1,498**	1 **245**	8,000	5,600	2,400	1,680
CONDITION A - Minimum Vehicular Volume	2 +	1	9,600	6,720	2,400	1,680
Satisfied	2 +	2 +	9,600	6,720	3,200	2,240
Not Satisfied XX	1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied XX	Major Street	Minor Street	Urban	Rural	Urban	Rural
	1 **1,498**	1 **245**	12,000	8,400	1,200	850
	2 +	1	14,400	10,080	1,200	850
	2 +	2 +	14,400	10,080	1,600	1,120
	1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B Satisfied / Not Satisfied XX			2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A 10%	B 12%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.			Critical Approach Speed (Major)		35	mph
Minor Street:	Driveway 11			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,360** vpd Minor Street Future ADT = **107** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,360**	*1* **107**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,360**	*1* **107**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 9%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	E+P Phase 3
				CALC CHS	DATE 09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE 09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)	35 mph
Minor Street: **Driveway 12**				Critical Approach Speed (Minor)	15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,497** vpd Minor Street Future ADT = **362** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **1,497** / *1* **362**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **1,497** / *1* **362**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied (XX)				
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 15% B: 12%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 13**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,623** vpd Minor Street Future ADT = **93** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **1,623** / *1* **93**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **1,623** / *1* **93**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied (XX)	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 4% B: 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Bickmore Av.			Critical Approach Speed (Major)		40	mph
Minor Street:	Mayhew Av.			Critical Approach Speed (Minor)		35	mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **6,334** vpd Minor Street Future ADT = **793** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **RURAL (R)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **6,334**	1 **793**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **6,334**	1 **793**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A: 33% B: 53%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Street B			Critical Approach Speed (Major)		25	mph
Minor Street:	Driveway 15			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **3,361** vpd Minor Street Future ADT = **277** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **3,361**	1 **277**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **3,361**	1 **277**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A 12% B 23%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Street B**				Critical Approach Speed (Major)		25 mph
Minor Street: **Driveway 16**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,820** vpd Minor Street Future ADT = **30** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **2,820** / 1 **30**	8,000	5,600	2,400	1,680
2 + / 1	9,600	6,720	2,400	1,680
2 + / 2 +	9,600	6,720	3,200	2,240
1 / 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **2,820** / 1 **30**	12,000	8,400	1,200	850
2 + / 1	14,400	10,080	1,200	850
2 + / 2 +	14,400	10,080	1,600	1,120
1 / 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied (XX)	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A 1% B 3%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P Phase 3	
				CALC	CHS	DATE	06/13/17
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	06/13/17
Major Street:	**Street B/Driveway 17**			Critical Approach Speed (Major)		25	mph
Minor Street:	**Driveway 18**			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **2,574** vpd Minor Street Future ADT = **216** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **2,574** / *1* **216**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **2,574** / *1* **216**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied (XX)	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 9% B: 18%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

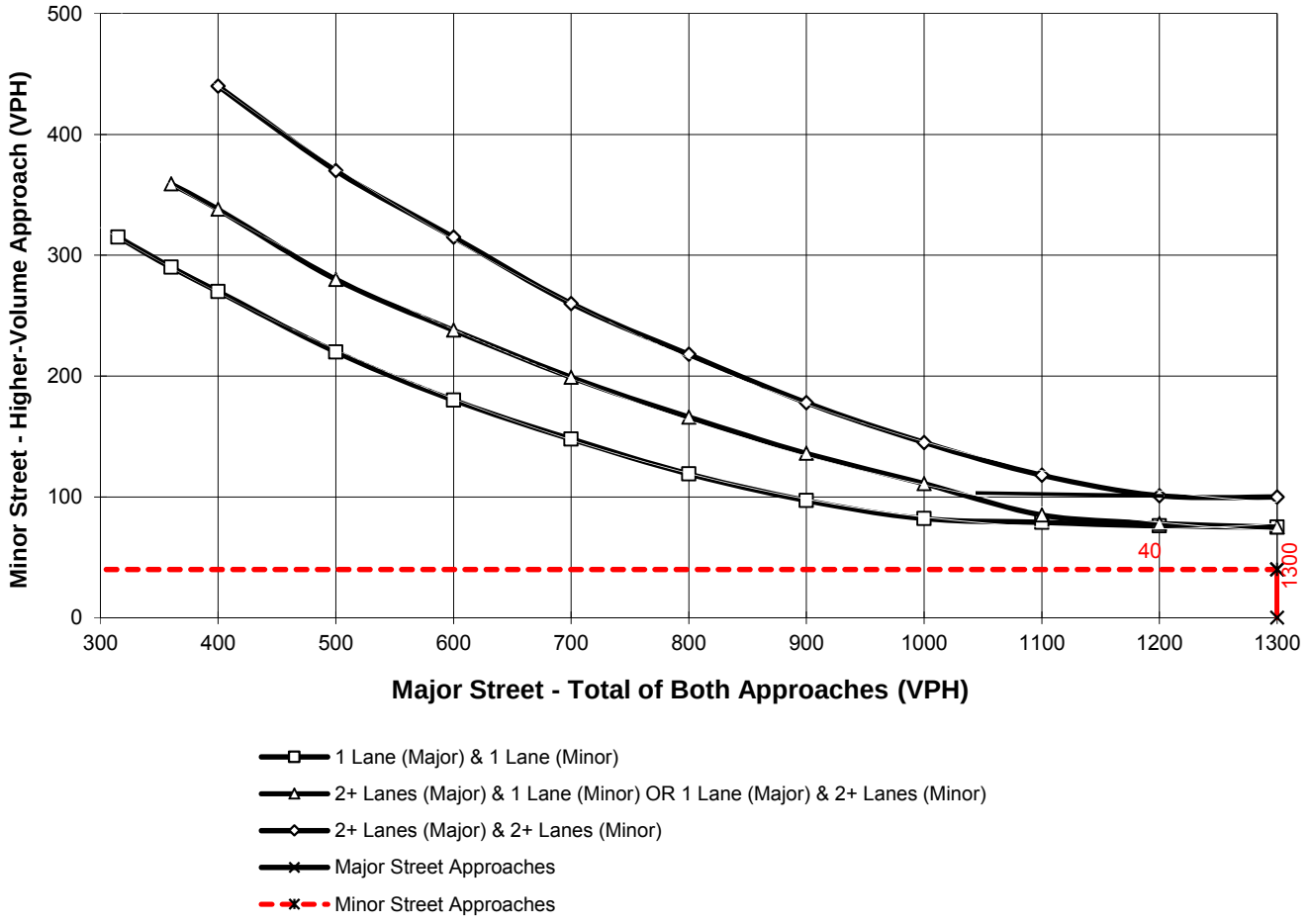
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Phase 3 Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1567**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Rincon Meadows Av.** High Volume Approach (VPH) = **40**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

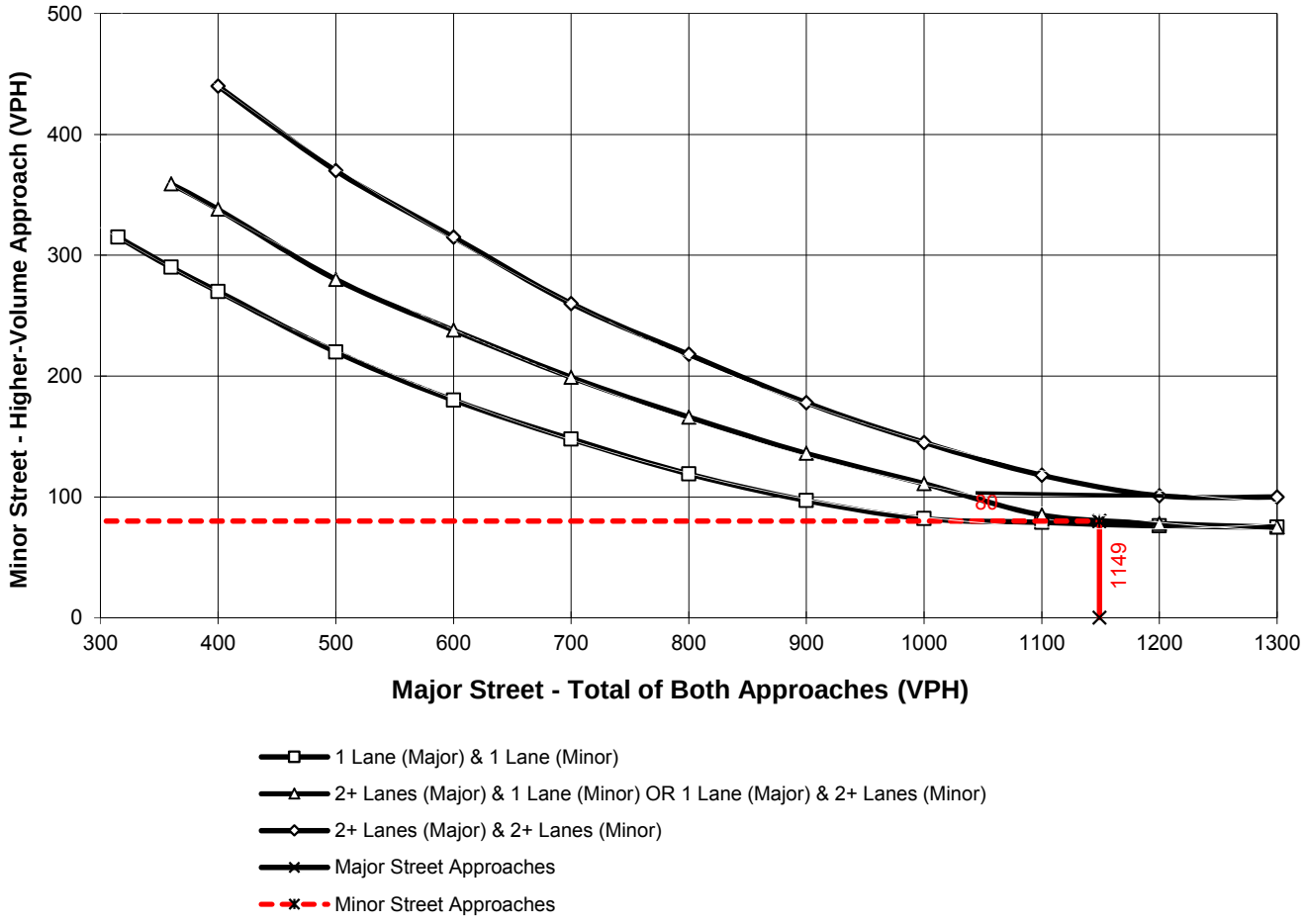
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Phase 3 Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1149**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Meadow Valley Av.** High Volume Approach (VPH) = **80**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 5.7:

E+P (PHASE 1) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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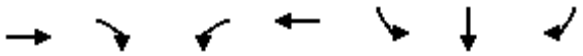


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1189	314	6	946	282	290	396
v/c Ratio	0.40	0.36	0.04	0.54	0.55	0.53	0.67
Control Delay	11.4	3.2	27.0	9.4	21.3	20.4	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	3.2	27.0	9.4	21.3	20.4	18.7
Queue Length 50th (ft)	70	0	2	100	86	87	82
Queue Length 95th (ft)	129	45	m4	m117	156	156	171
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	881	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.36	0.04	0.54	0.55	0.53	0.67

Intersection Summary

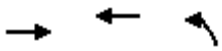
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	565	1145	593	315	194	397
v/c Ratio	1.05	0.51	0.44	0.47	0.99	0.93
Control Delay	80.6	5.9	14.7	9.7	94.1	57.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.6	5.9	14.7	9.7	94.1	57.7
Queue Length 50th (ft)	~124	74	80	41	79	79
Queue Length 95th (ft)	#213	136	118	98	#202	#160
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2251	1339	677	196	428
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.51	0.44	0.47	0.99	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

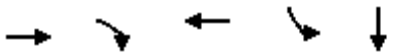
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2126	1006	556
v/c Ratio	0.68	0.31	1.16dr
Control Delay	6.3	7.4	37.7
Queue Delay	0.0	0.0	0.0
Total Delay	6.3	7.4	37.7
Queue Length 50th (ft)	134	79	142
Queue Length 95th (ft)	147	112	163
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3131	3238	1176
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.68	0.31	0.47

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1658	87	1181	518	493
v/c Ratio	0.66	0.11	0.47	0.85	0.79
Control Delay	18.9	3.9	10.6	37.9	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	3.9	10.6	37.9	29.9
Queue Length 50th (ft)	250	0	86	266	216
Queue Length 95th (ft)	282	19	93	292	246
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2522	807	2488	731	735
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.11	0.47	0.71	0.67

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	363	354	325	318	965	1033	496
v/c Ratio	0.95	0.91	0.70	0.91	0.45	0.83	0.59
Control Delay	69.6	60.6	26.1	49.5	19.0	33.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	1.4	0.0	0.0
Total Delay	69.6	60.6	26.1	49.5	20.5	33.4	5.3
Queue Length 50th (ft)	212	206	100	164	272	284	0
Queue Length 95th (ft)	#388	#384	203	m#308	m337	#397	68
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	474	367	2167	1252	846
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.89	0.69	0.87	0.79	0.83	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	310	381	924	577	305	1360
v/c Ratio	0.84	0.92	0.71	0.63	0.88	0.62
Control Delay	52.3	54.6	28.4	5.5	54.2	4.8
Queue Delay	0.2	0.5	0.0	0.0	0.0	0.7
Total Delay	52.5	55.1	28.4	5.5	54.2	5.5
Queue Length 50th (ft)	170	174	247	0	121	60
Queue Length 95th (ft)	#301	#343	324	76	m173	m80
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	449	1306	923	376	2192
Starvation Cap Reductn	0	0	0	0	0	439
Spillback Cap Reductn	5	5	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.86	0.71	0.63	0.81	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	505	301	575	981	72	697
v/c Ratio	0.35	0.37	0.92	0.35	0.18	0.88
Control Delay	47.2	23.6	48.7	0.3	44.8	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	23.6	48.7	0.3	44.8	16.2
Queue Length 50th (ft)	204	107	320	2	27	0
Queue Length 95th (ft)	m235	m115	m362	m6	40	119
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1426	813	694	2784	898	922
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.37	0.83	0.35	0.08	0.76

Intersection Summary

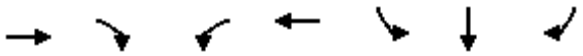
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	836	419	225	66	316	152	151	38
v/c Ratio	1.03	0.82	0.11	0.89	0.82	0.66	0.61	0.11
Control Delay	83.8	61.7	4.4	134.9	23.4	60.1	56.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.8	61.7	4.4	134.9	23.4	60.1	56.7	0.6
Queue Length 50th (ft)	~364	330	10	52	0	118	117	0
Queue Length 95th (ft)	#495	#581	16	#142	#138	173	171	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	813	512	2042	74	387	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.82	0.11	0.89	0.82	0.41	0.38	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1163	696	18	947	311	326	702
v/c Ratio	0.40	0.71	0.13	0.54	0.61	0.58	1.19
Control Delay	11.4	9.5	38.0	9.5	22.8	21.5	123.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	9.5	38.0	9.5	22.8	21.5	123.8
Queue Length 50th (ft)	68	34	7	76	96	100	~288
Queue Length 95th (ft)	126	#253	m14	97	174	176	#476
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	985	134	1738	511	562	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.71	0.13	0.54	0.61	0.58	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

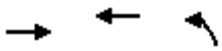
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	425	1170	623	560	181	297
v/c Ratio	0.80	0.55	0.50	0.80	0.74	0.56
Control Delay	36.4	9.1	16.8	20.3	44.9	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	9.1	16.8	20.3	44.9	27.5
Queue Length 50th (ft)	73	57	90	96	69	54
Queue Length 95th (ft)	#142	268	133	#268	#165	91
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1234	702	245	529
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.55	0.50	0.80	0.74	0.56

Intersection Summary

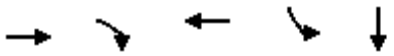
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1568	882	505
v/c Ratio	0.45	0.25	1.01dr
Control Delay	4.5	5.9	50.6
Queue Delay	0.0	0.0	0.0
Total Delay	4.5	5.9	50.6
Queue Length 50th (ft)	102	72	167
Queue Length 95th (ft)	154	110	214
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3487	3587	1021
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.25	0.49

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	686	86	999	739	841
v/c Ratio	0.51	0.18	0.74	0.73	0.86
Control Delay	39.0	8.3	39.4	18.3	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	8.3	39.4	18.3	25.5
Queue Length 50th (ft)	169	0	244	338	445
Queue Length 95th (ft)	212	41	299	498	695
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1347	472	1354	1041	1010
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.18	0.74	0.71	0.83

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	342	334	310	255	1031	902	545
v/c Ratio	0.86	0.82	0.69	0.85	0.48	0.68	0.60
Control Delay	53.0	45.2	27.6	48.6	19.8	27.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	53.0	45.2	27.6	48.6	21.1	27.4	5.3
Queue Length 50th (ft)	186	173	105	129	302	240	0
Queue Length 95th (ft)	#326	#309	202	m#233	371	314	74
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	453	489	331	2134	1326	902
Starvation Cap Reductn	0	0	0	0	822	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.74	0.63	0.77	0.79	0.68	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	340	374	868	588	301	1116
v/c Ratio	0.88	0.85	0.68	0.64	0.88	0.52
Control Delay	57.0	43.4	28.1	5.8	52.1	4.1
Queue Delay	2.5	1.7	0.0	0.0	0.0	0.4
Total Delay	59.5	45.1	28.1	5.8	52.1	4.5
Queue Length 50th (ft)	188	157	231	0	104	35
Queue Length 95th (ft)	#334	#310	305	81	m#269	72
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	474	1280	919	376	2161
Starvation Cap Reductn	0	0	0	0	0	491
Spillback Cap Reductn	29	28	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.84	0.68	0.64	0.80	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	824	190	321	843	163	1198
v/c Ratio	0.59	0.26	0.82	0.37	0.18	1.37
Control Delay	33.7	9.3	64.7	2.6	34.2	191.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	9.3	64.7	2.6	34.2	191.7
Queue Length 50th (ft)	354	39	201	26	50	~850
Queue Length 95th (ft)	423	101	269	31	78	#1114
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1385	732	619	2265	898	875
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.26	0.52	0.37	0.18	1.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	320	100	201	30	15	424	436	155
v/c Ratio	0.30	0.63	0.13	0.34	0.08	0.82	0.78	0.25
Control Delay	34.6	63.3	13.7	65.7	0.8	49.5	45.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	63.3	13.7	65.7	0.8	49.5	45.7	4.5
Queue Length 50th (ft)	102	69	35	23	0	311	314	0
Queue Length 95th (ft)	160	126	56	55	0	403	402	40
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1070	185	1563	91	190	632	682	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.54	0.13	0.33	0.08	0.67	0.64	0.21

Intersection Summary

APPENDIX 5.8:

E+P (PHASE 2) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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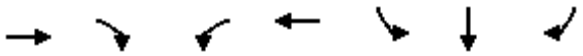


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1192	314	6	946	293	297	396
v/c Ratio	0.41	0.36	0.04	0.54	0.57	0.54	0.67
Control Delay	11.5	3.2	28.2	9.5	21.9	20.7	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	3.2	28.2	9.5	21.9	20.7	18.7
Queue Length 50th (ft)	70	0	3	99	90	90	82
Queue Length 95th (ft)	130	45	m4	m113	163	161	171
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	881	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.36	0.04	0.54	0.57	0.54	0.67

Intersection Summary

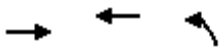
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	565	1167	593	318	194	397
v/c Ratio	0.96	0.51	0.44	0.47	1.13	1.06
Control Delay	56.7	5.6	14.7	9.8	140.7	93.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	5.6	14.7	9.8	140.7	93.8
Queue Length 50th (ft)	117	62	80	42	~92	~89
Queue Length 95th (ft)	#201	131	118	100	#212	#173
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	589	2308	1339	677	171	374
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.51	0.44	0.47	1.13	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

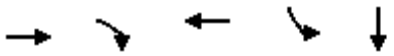
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2165	1006	556
v/c Ratio	0.69	0.31	1.17dr
Control Delay	6.5	7.5	37.9
Queue Delay	0.0	0.0	0.0
Total Delay	6.5	7.5	37.9
Queue Length 50th (ft)	138	79	143
Queue Length 95th (ft)	153	112	164
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3126	3233	1174
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.69	0.31	0.47

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1662	87	1181	552	496
v/c Ratio	0.68	0.11	0.49	0.87	0.77
Control Delay	20.1	4.0	11.3	39.0	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	4.0	11.3	39.0	27.7
Queue Length 50th (ft)	263	0	87	282	210
Queue Length 95th (ft)	283	19	93	321	248
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2443	784	2414	731	735
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.68	0.11	0.49	0.76	0.67

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	376	368	332	323	966	1039	496
v/c Ratio	0.96	0.93	0.70	0.92	0.45	0.84	0.59
Control Delay	72.5	63.7	26.6	50.3	18.9	34.7	5.4
Queue Delay	0.0	0.0	0.0	0.0	1.5	0.0	0.0
Total Delay	72.5	63.7	26.6	50.3	20.4	34.7	5.4
Queue Length 50th (ft)	222	218	104	169	272	286	0
Queue Length 95th (ft)	#407	#406	209	m#301	m336	#401	68
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	474	367	2151	1232	840
Starvation Cap Reductn	0	0	0	0	941	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.92	0.70	0.88	0.80	0.84	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	310	407	929	582	305	1398
v/c Ratio	0.80	0.94	0.73	0.64	0.88	0.65
Control Delay	47.6	59.1	29.7	5.7	53.0	5.3
Queue Delay	0.2	1.0	0.0	0.0	0.0	0.9
Total Delay	47.9	60.0	29.7	5.7	53.0	6.2
Queue Length 50th (ft)	170	193	249	0	123	67
Queue Length 95th (ft)	#301	#380	326	78	m166	m83
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	449	1266	915	376	2152
Starvation Cap Reductn	0	0	0	0	0	432
Spillback Cap Reductn	5	5	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.92	0.73	0.64	0.81	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	508	301	575	990	72	741
v/c Ratio	0.41	0.40	0.92	0.38	0.12	0.94
Control Delay	52.7	24.8	51.6	0.4	38.0	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	24.8	51.6	0.4	38.0	27.0
Queue Length 50th (ft)	211	105	374	4	24	78
Queue Length 95th (ft)	m237	m116	m#582	m6	40	#272
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1244	748	626	2597	925	886
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.40	0.92	0.38	0.08	0.84

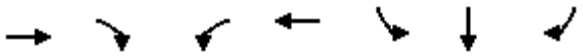
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	839	419	225	66	316	152	151	38
v/c Ratio	1.00	0.84	0.11	0.89	0.82	0.66	0.61	0.11
Control Delay	76.4	63.6	4.2	134.9	23.4	60.1	56.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	63.6	4.2	134.9	23.4	60.1	56.7	0.6
Queue Length 50th (ft)	343	327	10	52	0	118	117	0
Queue Length 95th (ft)	#485	#596	16	#142	#138	173	171	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	839	500	2042	74	387	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.84	0.11	0.89	0.82	0.41	0.38	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1163	696	18	951	314	326	702
v/c Ratio	0.40	0.71	0.13	0.55	0.61	0.58	1.19
Control Delay	11.4	9.5	37.7	9.4	23.0	21.5	123.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	9.5	37.7	9.4	23.0	21.5	123.8
Queue Length 50th (ft)	68	34	7	76	97	100	~288
Queue Length 95th (ft)	126	#253	m13	97	176	176	#476
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	985	134	1738	511	562	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.71	0.13	0.55	0.61	0.58	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

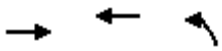
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	425	1175	626	581	181	297
v/c Ratio	0.80	0.55	0.51	0.83	0.74	0.56
Control Delay	36.4	9.1	16.8	22.6	44.9	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	9.1	16.8	22.6	44.9	27.5
Queue Length 50th (ft)	73	57	91	106	69	54
Queue Length 95th (ft)	#142	269	134	#286	#165	91
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1234	702	245	529
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.55	0.51	0.83	0.74	0.56

Intersection Summary

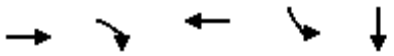
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1575	885	505
v/c Ratio	0.45	0.25	1.02dr
Control Delay	4.6	6.0	50.7
Queue Delay	0.0	0.0	0.0
Total Delay	4.6	6.0	50.7
Queue Length 50th (ft)	103	72	168
Queue Length 95th (ft)	155	110	215
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3484	3585	1020
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.25	0.50

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	686	86	1002	743	842
v/c Ratio	0.51	0.18	0.74	0.74	0.86
Control Delay	39.0	8.3	39.5	18.5	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	8.3	39.5	18.5	25.6
Queue Length 50th (ft)	169	0	245	342	447
Queue Length 95th (ft)	212	41	300	504	697
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1346	472	1353	1041	1010
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.18	0.74	0.71	0.83

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	346	336	310	282	1036	903	545
v/c Ratio	0.87	0.82	0.69	0.89	0.49	0.70	0.61
Control Delay	53.7	45.3	27.7	52.7	20.0	28.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	53.7	45.3	27.7	52.7	21.4	28.4	5.4
Queue Length 50th (ft)	189	174	105	148	306	240	0
Queue Length 95th (ft)	#332	#312	202	m#265	374	314	74
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	453	488	331	2130	1289	892
Starvation Cap Reductn	0	0	0	0	822	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.74	0.64	0.85	0.79	0.70	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	340	379	900	621	301	1123
v/c Ratio	0.88	0.87	0.70	0.66	0.88	0.52
Control Delay	57.0	45.0	28.9	6.0	52.2	4.1
Queue Delay	2.9	2.2	0.0	0.0	0.0	0.4
Total Delay	59.9	47.2	28.9	6.0	52.2	4.5
Queue Length 50th (ft)	188	162	243	0	105	37
Queue Length 95th (ft)	#334	#320	319	85	m#264	73
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	474	1280	940	376	2161
Starvation Cap Reductn	0	0	0	0	0	490
Spillback Cap Reductn	32	31	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.86	0.70	0.66	0.80	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	824	190	321	897	163	1207
v/c Ratio	0.59	0.26	0.83	0.40	0.18	1.44
Control Delay	33.5	9.2	65.5	2.6	34.2	224.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	9.2	65.5	2.6	34.2	224.9
Queue Length 50th (ft)	354	38	206	27	50	~928
Queue Length 95th (ft)	423	98	269	32	78	#1192
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1391	735	562	2265	898	837
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.26	0.57	0.40	0.18	1.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	320	100	206	30	15	424	436	155
v/c Ratio	0.30	0.64	0.13	0.34	0.08	0.82	0.78	0.25
Control Delay	34.3	61.7	13.2	65.7	0.8	49.5	45.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	61.7	13.2	65.7	0.8	49.5	45.7	4.5
Queue Length 50th (ft)	102	64	34	23	0	311	314	0
Queue Length 95th (ft)	158	#128	57	55	0	403	402	40
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1075	175	1563	91	190	632	682	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.57	0.13	0.33	0.08	0.67	0.64	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 5.9:

E+P (PROJECT BUILDOUT) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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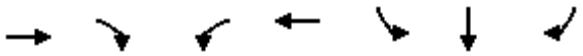


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1198	314	6	947	308	308	396
v/c Ratio	0.41	0.36	0.04	0.54	0.60	0.56	0.67
Control Delay	11.5	3.2	27.0	9.4	22.7	21.2	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	3.2	27.0	9.4	22.7	21.2	18.7
Queue Length 50th (ft)	70	0	2	100	95	93	82
Queue Length 95th (ft)	131	45	m4	m117	173	168	171
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	881	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.36	0.04	0.54	0.60	0.56	0.67

Intersection Summary

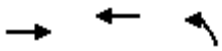
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	565	1200	594	322	194	397
v/c Ratio	1.05	0.52	0.43	0.46	1.13	1.06
Control Delay	79.5	5.7	13.9	9.4	140.7	93.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	5.7	13.9	9.4	140.7	93.8
Queue Length 50th (ft)	~124	64	77	41	~92	~89
Queue Length 95th (ft)	#209	138	115	98	#212	#173
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2308	1396	700	171	374
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.52	0.43	0.46	1.13	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

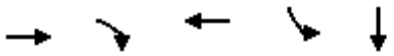
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2215	1007	556
v/c Ratio	0.71	0.31	1.18dr
Control Delay	6.8	7.5	38.2
Queue Delay	0.0	0.0	0.0
Total Delay	6.8	7.5	38.2
Queue Length 50th (ft)	146	80	144
Queue Length 95th (ft)	165	113	165
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3123	3226	1171
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.71	0.31	0.47

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1670	87	1182	572	521
v/c Ratio	0.70	0.11	0.50	0.88	0.78
Control Delay	20.9	4.0	11.8	39.3	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	4.0	11.8	39.3	28.1
Queue Length 50th (ft)	272	0	88	290	222
Queue Length 95th (ft)	285	19	93	337	267
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2389	769	2362	731	739
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.70	0.11	0.50	0.78	0.71

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	382	383	348	328	967	1047	496
v/c Ratio	0.97	0.96	0.74	0.93	0.45	0.86	0.59
Control Delay	74.8	70.4	28.9	50.8	20.3	35.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Total Delay	74.8	70.4	28.9	50.8	21.9	35.5	5.4
Queue Length 50th (ft)	227	232	115	173	273	290	0
Queue Length 95th (ft)	#416	#431	#249	m#293	m338	#407	68
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	473	367	2147	1224	838
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.96	0.74	0.89	0.80	0.86	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	310	436	936	589	305	1445
v/c Ratio	0.76	0.97	0.77	0.65	0.88	0.69
Control Delay	44.0	64.6	31.2	5.9	51.4	5.7
Queue Delay	0.3	2.6	0.0	0.0	0.0	1.3
Total Delay	44.3	67.3	31.2	5.9	51.4	7.0
Queue Length 50th (ft)	170	217	252	0	126	75
Queue Length 95th (ft)	#301	#423	330	78	m163	m86
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	449	1223	909	376	2109
Starvation Cap Reductn	0	0	0	0	0	419
Spillback Cap Reductn	6	6	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.98	0.77	0.65	0.81	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	515	301	575	1002	72	802
v/c Ratio	0.46	0.43	0.95	0.41	0.10	0.97
Control Delay	56.3	25.3	59.9	0.5	34.4	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	25.3	59.9	0.5	34.4	35.2
Queue Length 50th (ft)	215	109	~481	5	21	159
Queue Length 95th (ft)	m237	m119	m#574	m6	40	#457
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1114	701	604	2422	898	868
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.43	0.95	0.41	0.08	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

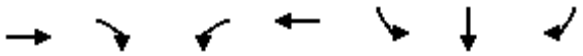
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	845	419	226	66	316	152	151	38
v/c Ratio	0.97	0.86	0.11	0.89	0.82	0.66	0.61	0.11
Control Delay	69.3	65.4	4.1	134.9	23.4	60.1	56.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	65.4	4.1	134.9	23.4	60.1	56.7	0.6
Queue Length 50th (ft)	342	321	8	52	0	118	117	0
Queue Length 95th (ft)	#477	#609	16	#142	#138	173	171	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	868	486	2042	74	387	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.86	0.11	0.89	0.82	0.41	0.38	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1165	696	18	956	319	328	702
v/c Ratio	0.40	0.71	0.13	0.55	0.62	0.58	1.19
Control Delay	11.4	9.5	37.7	9.4	23.3	21.6	123.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	9.5	37.7	9.4	23.3	21.6	123.8
Queue Length 50th (ft)	68	34	7	76	100	101	~288
Queue Length 95th (ft)	126	#253	m13	97	180	178	#476
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	985	134	1738	511	562	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.71	0.13	0.55	0.62	0.58	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

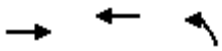
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	425	1184	631	603	181	297
v/c Ratio	0.80	0.55	0.51	0.86	0.74	0.56
Control Delay	36.4	9.1	16.9	25.5	44.9	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	9.1	16.9	25.5	44.9	27.5
Queue Length 50th (ft)	73	57	92	117	69	54
Queue Length 95th (ft)	#142	271	135	#306	#165	91
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1234	702	245	529
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.55	0.51	0.86	0.74	0.56

Intersection Summary

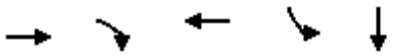
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1588	891	505
v/c Ratio	0.46	0.25	1.02dr
Control Delay	4.6	6.0	50.9
Queue Delay	0.0	0.0	0.0
Total Delay	4.6	6.0	50.9
Queue Length 50th (ft)	104	73	169
Queue Length 95th (ft)	157	112	215
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3485	3583	1018
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.46	0.25	0.50

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	688	86	1007	753	843
v/c Ratio	0.51	0.18	0.74	0.74	0.86
Control Delay	39.1	8.3	39.7	18.9	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	8.3	39.7	18.9	25.7
Queue Length 50th (ft)	169	0	247	351	449
Queue Length 95th (ft)	212	41	302	517	704
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1345	472	1352	1041	1009
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.18	0.74	0.72	0.84

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	347	342	314	306	1043	905	545
v/c Ratio	0.87	0.83	0.70	0.91	0.49	0.73	0.62
Control Delay	53.9	47.1	28.5	53.6	20.4	29.6	5.6
Queue Delay	0.0	0.0	0.0	0.0	1.4	0.0	0.0
Total Delay	53.9	47.1	28.5	53.6	21.8	29.6	5.6
Queue Length 50th (ft)	190	180	109	165	310	241	0
Queue Length 95th (ft)	#333	#323	207	m#294	379	315	74
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	452	487	342	2129	1246	880
Starvation Cap Reductn	0	0	0	0	822	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.76	0.64	0.89	0.80	0.73	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	340	387	931	652	301	1136
v/c Ratio	0.88	0.89	0.73	0.68	0.88	0.53
Control Delay	57.0	48.4	29.7	6.2	52.8	4.1
Queue Delay	3.5	3.3	0.0	0.0	0.0	0.4
Total Delay	60.5	51.8	29.7	6.2	52.8	4.5
Queue Length 50th (ft)	188	170	255	0	105	39
Queue Length 95th (ft)	#334	#333	#334	88	m#251	75
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	472	1280	959	376	2161
Starvation Cap Reductn	0	0	0	0	0	486
Spillback Cap Reductn	36	35	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.89	0.73	0.68	0.80	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	827	190	321	958	163	1226
v/c Ratio	0.59	0.26	0.84	0.42	0.18	1.51
Control Delay	33.3	9.1	66.3	2.6	34.2	257.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	9.1	66.3	2.6	34.2	257.2
Queue Length 50th (ft)	355	38	209	28	50	~1005
Queue Length 95th (ft)	424	97	269	33	78	#1268
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1396	737	520	2265	898	810
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.26	0.62	0.42	0.18	1.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	322	100	210	30	15	424	436	155
v/c Ratio	0.30	0.64	0.13	0.34	0.08	0.82	0.78	0.25
Control Delay	34.4	61.6	12.6	65.7	0.8	49.5	45.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	61.6	12.6	65.7	0.8	49.5	45.7	4.5
Queue Length 50th (ft)	102	62	33	23	0	311	314	0
Queue Length 95th (ft)	160	#127	58	55	0	403	402	40
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1075	175	1563	91	190	632	682	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.57	0.13	0.33	0.08	0.67	0.64	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 5.10:

E+P (PHASE 1) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3750*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1386*	pc/h/ln
S	*69.6*	mph
D = v_p / S	*19.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2906*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1063*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3499*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1287*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4007*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2210*	pc/h/ln
S	*58.2*	mph
D = v_p / S	*38.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4125*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1524*	pc/h/ln
S	*68.8*	mph
D = v_p / S	*22.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3159*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1167*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5725*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2199*	pc/h/ln
S	*58.4*	mph
D = v_p / S	*37.6*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4155*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*15*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.930*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1618*	pc/h/ln
S	*68.0*	mph
D = v_p / S	*23.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6396*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1764*	pc/h/ln
S	*66.3*	mph
D = v_p / S	*26.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6502*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1793*	pc/h/ln
S	*65.9*	mph
D = v_p / S	*27.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6496*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1818*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6599*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1847*	pc/h/ln
S	*65.1*	mph
D = v_p / S	*28.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3340*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1228*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2114*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*777*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*11.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3414*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1256*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*18.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3234*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1775*	pc/h/ln
S	*66.2*	mph
D = v_p / S	*26.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4078*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1507*	pc/h/ln
S	*68.9*	mph
D = v_p / S	*21.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3116*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1152*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5134*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1944*	pc/h/ln
S	*63.6*	mph
D = v_p / S	*30.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4282*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1645*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6609*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1823*	pc/h/ln
S	*65.5*	mph
D = v_p / S	*27.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6750*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1862*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5928*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1643*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 1*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6027*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1671*	pc/h/ln
S	*67.4*	mph
D = v_p / S	*24.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 5.11:

E+P (PHASE 2) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3782*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1398*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2925*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1070*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3518*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1294*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4012*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2213*	pc/h/ln
S	*58.1*	mph
D = v_p / S	*38.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4130*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1526*	pc/h/ln
S	*68.8*	mph
D = v_p / S	*22.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3162*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1169*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5728*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2200*	pc/h/ln
S	*58.4*	mph
D = v_p / S	*37.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4186*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1638*	pc/h/ln
S	*67.8*	mph
D = v_p / S	*24.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6398*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1765*	pc/h/ln
S	*66.3*	mph
D = v_p / S	*26.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*RV*	Highway/Direction of Travel	*SR-60 Westbound*
Agency or Company	*Urban Crossroads, Inc.*	From/To	*E of Euclid*
Date Performed	*6/13/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6520*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*4*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1798*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*65.9*	mph	S		mph
D = v_p / S	*27.3*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*D*		Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6510*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1822*	pc/h/ln
S	*65.5*	mph
D = v_p / S	*27.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6601*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1848*	pc/h/ln
S	*65.1*	mph
D = v_p / S	*28.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3347*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1231*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2118*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*779*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*11.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3418*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1257*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*18.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3266*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1793*	pc/h/ln
S	*65.9*	mph
D = v_p / S	*27.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4111*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1519*	pc/h/ln
S	*68.8*	mph
D = v_p / S	*22.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3136*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1159*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5154*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1951*	pc/h/ln
S	*63.5*	mph
D = v_p / S	*30.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4288*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1647*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*RV*	Highway/Direction of Travel	*SR-60 Westbound*
Agency or Company	*Urban Crossroads, Inc.*	From/To	*W of Euclid*
Date Performed	*6/13/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6623*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*4*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1827*	pc/h/ln	Design LOS	
S	*65.4*	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	*27.9*	pc/mi/ln	S	mph
LOS	*D*		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6754*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1863*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5930*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1644*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 2*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6045*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1676*	pc/h/ln
S	*67.4*	mph
D = v_p / S	*24.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 5.12:

E+P (PROJECT BUILDOUT) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3831*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1416*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2955*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1081*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3548*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1311*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4021*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2218*	pc/h/ln
S	*58.0*	mph
D = v_p / S	*38.3*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4139*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1537*	pc/h/ln
S	*68.7*	mph
D = v_p / S	*22.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3168*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1171*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5734*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2202*	pc/h/ln
S	*58.4*	mph
D = v_p / S	*37.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4236*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1658*	pc/h/ln
S	*67.6*	mph
D = v_p / S	*24.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6402*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1766*	pc/h/ln
S	*66.3*	mph
D = v_p / S	*26.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6543*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1814*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6528*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1827*	pc/h/ln
S	*65.4*	mph
D = v_p / S	*27.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6606*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1849*	pc/h/ln
S	*65.1*	mph
D = v_p / S	*28.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3361*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1236*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2126*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*782*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*11.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3426*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1260*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*18.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3309*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1816*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4153*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1542*	pc/h/ln
S	*68.6*	mph
D = v_p / S	*22.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3161*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1174*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5179*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1961*	pc/h/ln
S	*63.3*	mph
D = v_p / S	*31.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4303*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1653*	pc/h/ln
S	*67.6*	mph
D = v_p / S	*24.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6639*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1831*	pc/h/ln
S	*65.4*	mph
D = v_p / S	*28.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6760*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1865*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5935*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1645*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/12/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*E+P Phase 3*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6065*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1681*	pc/h/ln
S	*67.3*	mph
D = v_p / S	*25.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 5.13:

E+P (PHASE 1) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3750	V_D =	veh/h
		Ramp Volume, V_R	844		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3750	0.92	Level	4	0	0.980	1.00	4158
Ramp	844	0.92	Level	11	0	0.948	1.00	968
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.612 using Equation (Exhibit 13-7)

V_{12} = 2919 pc/h

V_3 or V_{av34} 1239 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4158	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3190	Exhibit 13-8	7200	No
V_R	968	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2919	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.385 (Exhibit 13-12)

S_R = 59.2 mph (Exhibit 13-12)

S_0 = 75.9 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3499	V_D =	169 veh/h
		Ramp Volume, V_R	711		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3499	0.92	Level	3	0	0.985	1.00	3860
Ramp	711	0.92	Level	10	0	0.952	1.00	811
UpStream								
DownStream	169	0.92	Level	19	0	0.913	1.00	201

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.626 using Equation (Exhibit 13-7)

V_{12} = 2720 pc/h

V_3 or V_{av34} 1140 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3860	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3049	Exhibit 13-8	7200	No
V_R	811	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2720	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.371 (Exhibit 13-12)

S_R= 59.6 mph (Exhibit 13-12)

S_0= 76.2 mph (Exhibit 13-12)

S = 63.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 264 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3131	
	Ramp Volume, V_R: 365	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3131	0.92	Level	2	0	0.990	1.00	3437
Ramp	365	0.92	Level	15	0	0.930	1.00	426
UpStream	264	0.92	Level	11	0	0.948	1.00	303
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3437 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3863	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3863	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.483 (Exibit 13-11)

S_R = 56.5 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 511 veh/h
	Freeway Volume, V_F: 3131	
	Ramp Volume, V_R: 365	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3131	0.92	Level	2	0	0.990	1.00	3437
Ramp	365	0.92	Level	15	0	0.930	1.00	426
UpStream								
DownStream	511	0.92	Level	1	0	0.995	1.00	558

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3437 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3863	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3863	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.483 (Exibit 13-11)

S_R = 56.5 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3159	
	Ramp Volume, V_R: 966	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3159	0.92	Level	4	0	0.980	1.00	3502
Ramp	966	0.92	Level	6	0	0.971	1.00	1081
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2067 pc/h

V_3 or V_{av34} = 1435 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2067 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4583	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3148	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 26.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.371 (Exibit 13-11)

S_R = 59.6 mph (Exhibit 13-11)

S_0 = 66.6 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1170 ft
V_u = 750 veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	4996
Ramp Volume, V_R	729
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4996	0.92	Level	12	0	0.943	1.00	5756
Ramp	729	0.92	Level	9	0	0.957	1.00	828
UpStream	750	0.92	Level	2	0	0.990	1.00	823
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.591 using Equation (Exhibit 13-6)
V_{12} = 3405 pc/h
V_3 or V_{av34} = 2351 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3405 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6584	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4233	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 35.0 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.545 (Exibit 13-11)
S_R = 54.7 mph (Exhibit 13-11)
S_0 = 63.2 mph (Exhibit 13-11)
S = 57.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 797 veh/h
	Freeway Volume, V_F: 4155	
	Ramp Volume, V_R: 657	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4155	0.92	Level	15	0	0.930	1.00	4855
Ramp	657	0.92	Level	10	0	0.952	1.00	750
UpStream								
DownStream	797	0.92	Level	4	0	0.980	1.00	884

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.604 using Equation (Exhibit 13-7)

V_{12} = 3230 pc/h

V_3 or V_{av34} 1625 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4855	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4105	Exhibit 13-8	7200	No
V_R	750	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3230	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.366 (Exhibit 13-12)

S_R = 59.8 mph (Exhibit 13-12)

S_0 = 74.4 mph (Exhibit 13-12)

S = 64.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2200 ft
- V_u = 748 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	5754
Ramp Volume, V_R	642
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5754	0.92	Level	1	0	0.995	1.00	6286
Ramp	642	0.92	Level	17	0	0.922	1.00	757
UpStream	748	0.92	Level	21	0	0.905	1.00	898
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.123 using Equation (Exhibit 13-6)

V_{12} = 774 pc/h

V_3 or V_{av34} = 2756 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2514 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7043	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3271	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.356 (Exibit 13-11)

S_R = 60.0 mph (Exhibit 13-11)

S_0 = 65.0 mph (Exhibit 13-11)

S = 62.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	6502	V_D =	642 veh/h
		Ramp Volume, V_R	748		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6502	0.92	Level	3	0	0.985	1.00	7173
Ramp	748	0.92	Level	21	0	0.905	1.00	898
UpStream								
DownStream	642	0.92	Level	17	0	0.922	1.00	757

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3634 pc/h

V_3 or V_{av34} 1769 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7173	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6275	Exhibit 13-8	9600	No
V_R	898	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3634	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.379 (Exhibit 13-12)

S_R= 59.4 mph (Exhibit 13-12)

S_0= 73.8 mph (Exhibit 13-12)

S = 65.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 652 veh/h
	Freeway Volume, V_F: 6496	
	Ramp Volume, V_R: 549	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6496	0.92	Level	6	0	0.971	1.00	7273
Ramp	549	0.92	Level	18	0	0.917	1.00	650
UpStream								
DownStream	652	0.92	Level	19	0	0.913	1.00	776

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3538 pc/h

V_3 or V_{av34} 1867 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7273	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6623	Exhibit 13-8	9600	No
V_R	650	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3538	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.356 (Exhibit 13-12)

S_R = 60.0 mph (Exhibit 13-12)

S_0 = 73.4 mph (Exhibit 13-12)

S = 66.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2115 ft
- V_u = 549 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5947
Ramp Volume, V_R	652
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5947	0.92	Level	5	0	0.976	1.00	6626
Ramp	652	0.92	Level	19	0	0.913	1.00	776
UpStream	549	0.92	Level	18	0	0.917	1.00	650
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = (Equation 13-6 or 13-7)
- P_{FM} = 0.121 using Equation (Exhibit 13-6)
- V_{12} = 800 pc/h
- V_3 or V_{av34} = 2913 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 2650 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7402	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3426	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

- D_R = 28.7 (pc/mi/ln)
- LOS = D (Exhibit 13-2)

Speed Determination

- M_S = 0.396 (Exibit 13-11)
- S_R = 58.9 mph (Exhibit 13-11)
- S_0 = 64.6 mph (Exhibit 13-11)
- S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3340	V_D =	veh/h
		Ramp Volume, V_R	1226		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3340	0.92	Level	3	0	0.985	1.00	3685
Ramp	1226	0.92	Level	4	0	0.980	1.00	1359
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.605 using Equation (Exhibit 13-7)

V_{12} = 2767 pc/h

V_3 or V_{av34} 918 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3685	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2326	Exhibit 13-8	7200	No
V_R	1359	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2767	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.420 (Exhibit 13-12)

S_R = 58.2 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 62.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 325 veh/h
	Freeway Volume, V_F: 3414	
	Ramp Volume, V_R: 1485	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3414	0.92	Level	3	0	0.985	1.00	3767
Ramp	1485	0.92	Level	4	0	0.980	1.00	1646
UpStream								
DownStream	325	0.92	Level	3	0	0.985	1.00	359

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.590 using Equation (Exhibit 13-7)

V_{12} = 2898 pc/h

V_3 or V_{av34} 869 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3767	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2121	Exhibit 13-8	7200	No
V_R	1646	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2898	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.446 (Exhibit 13-12)

S_R = 57.5 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 61.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 952 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2596	
	Ramp Volume, V_R: 573	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2596	0.92	Level	1	0	0.995	1.00	2836
Ramp	573	0.92	Level	5	0	0.976	1.00	638
UpStream	952	0.92	Level	4	0	0.980	1.00	1055
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2836 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3474	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3474	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 29.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.423 (Exibit 13-11)

S_R = 58.2 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 58.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 65 veh/h
	Freeway Volume, V_F: 2596	
	Ramp Volume, V_R: 573	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2596	0.92	Level	1	0	0.995	1.00	2836
Ramp	573	0.92	Level	5	0	0.976	1.00	638
UpStream								
DownStream	65	0.92	Level	8	0	0.962	1.00	73

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2836 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3474	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3474	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 29.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.423 (Exibit 13-11)

S_R = 58.2 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 58.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3116	
	Ramp Volume, V_R: 962	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3116	0.92	Level	4	0	0.980	1.00	3455
Ramp	962	0.92	Level	4	0	0.980	1.00	1067
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2039 pc/h

V_3 or V_{av34} = 1416 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2039 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4522	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3106	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 26.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.368 (Exibit 13-11)

S_R = 59.7 mph (Exhibit 13-11)

S_0 = 66.7 mph (Exhibit 13-11)

S = 61.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{up} = 1170 ft
V_u = 363 veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	4627
Ramp Volume, V_R	507
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4627	0.92	Level	8	0	0.962	1.00	5231
Ramp	507	0.92	Level	10	0	0.952	1.00	579
UpStream	363	0.92	Level	2	0	0.990	1.00	399
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.591 using Equation (Exhibit 13-6)
V_{12} = 3094 pc/h
V_3 or V_{av34} = 2137 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3094 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5810	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3673	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.7 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.430 (Exibit 13-11)
S_R = 58.0 mph (Exhibit 13-11)
S_0 = 64.1 mph (Exhibit 13-11)
S = 60.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 450 veh/h
	Freeway Volume, V_F: 4282	
	Ramp Volume, V_R: 1140	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4282	0.92	Level	12	0	0.943	1.00	4934
Ramp	1140	0.92	Level	8	0	0.962	1.00	1289
UpStream								
DownStream	450	0.92	Level	2	0	0.990	1.00	494

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.577 using Equation (Exhibit 13-7)

V_{12} = 3393 pc/h

V_3 or V_{av34} 1541 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4934	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3645	Exhibit 13-8	7200	No
V_R	1289	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3393	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.414 (Exhibit 13-12)

S_R = 58.4 mph (Exhibit 13-12)

S_0 = 74.7 mph (Exhibit 13-12)

S = 62.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 830 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	5920
Ramp Volume, V_R	689
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5920	0.92	Level	2	0	0.990	1.00	6499
Ramp	689	0.92	Level	11	0	0.948	1.00	790
UpStream	830	0.92	Level	10	0	0.952	1.00	947
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.119 using Equation (Exhibit 13-6)
V_{12} = 774 pc/h
V_3 or V_{av34} = 2862 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2599 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7289	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3389	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.8 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.369 (Exibit 13-11)
S_R = 59.7 mph (Exhibit 13-11)
S_0 = 64.8 mph (Exhibit 13-11)
S = 62.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 689 veh/h
	Freeway Volume, V_F: 6750	
	Ramp Volume, V_R: 830	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6750	0.92	Level	3	0	0.985	1.00	7447
Ramp	830	0.92	Level	10	0	0.952	1.00	947
UpStream								
DownStream	689	0.92	Level	11	0	0.948	1.00	790

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3781 pc/h

V_3 or V_{av34} 1833 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7447	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6500	Exhibit 13-8	9600	No
V_R	947	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3781	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.2 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.383 (Exhibit 13-12)

S_R = 59.3 mph (Exhibit 13-12)

S_0 = 73.5 mph (Exhibit 13-12)

S = 65.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 723 veh/h
	Freeway Volume, V_F: 5928	
	Ramp Volume, V_R: 624	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5928	0.92	Level	4	0	0.980	1.00	6572
Ramp	624	0.92	Level	12	0	0.943	1.00	719
UpStream								
DownStream	723	0.92	Level	15	0	0.930	1.00	845

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3271 pc/h

V_3 or V_{av34} 1650 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6572	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5853	Exhibit 13-8	9600	No
V_R	719	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3271	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.363 (Exhibit 13-12)

S_R = 59.8 mph (Exhibit 13-12)

S_0 = 74.3 mph (Exhibit 13-12)

S = 66.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 1

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 624 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5304
Ramp Volume, V_R	723
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5304	0.92	Level	3	0	0.985	1.00	5852
Ramp	723	0.92	Level	15	0	0.930	1.00	845
UpStream	624	0.92	Level	12	0	0.943	1.00	719
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.112 using Equation (Exhibit 13-6)
V_{12} = 656 pc/h
V_3 or V_{av34} = 2598 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2340 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6697	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3185	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.8 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.370 (Exibit 13-11)
S_R = 59.6 mph (Exhibit 13-11)
S_0 = 65.5 mph (Exhibit 13-11)
S = 62.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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APPENDIX 5.14:

E+P (PHASE 2) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3782	V_D =	veh/h
		Ramp Volume, V_R	857		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3782	0.92	Level	4	0	0.980	1.00	4193
Ramp	857	0.92	Level	11	0	0.948	1.00	983
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.610 using Equation (Exhibit 13-7)

V_{12} = 2941 pc/h

V_3 or V_{av34} 1252 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4193	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3210	Exhibit 13-8	7200	No
V_R	983	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2941	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.386 (Exhibit 13-12)

S_R = 59.2 mph (Exhibit 13-12)

S_0 = 75.8 mph (Exhibit 13-12)

S = 63.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3518	V_D =	169 veh/h
		Ramp Volume, V_R	730		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3518	0.92	Level	3	0	0.985	1.00	3881
Ramp	730	0.92	Level	11	0	0.948	1.00	837
UpStream								
DownStream	169	0.92	Level	19	0	0.913	1.00	201

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.624 using Equation (Exhibit 13-7)

V_{12} = 2738 pc/h

V_3 or V_{av34} 1143 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3881	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3044	Exhibit 13-8	7200	No
V_R	837	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2738	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.373 (Exhibit 13-12)

S_R = 59.5 mph (Exhibit 13-12)

S_0 = 76.2 mph (Exhibit 13-12)

S = 63.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	475	☑ No	☐ Off
L_{up} =	1460 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	264 veh/h	Freeway Volume, V_F	3131	V_D =	veh/h
		Ramp Volume, V_R	370		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	25.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3131	0.92	Level	2	0	0.990	1.00	3437
Ramp	370	0.92	Level	15	0	0.930	1.00	432
UpStream	264	0.92	Level	11	0	0.948	1.00	303
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3437 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3869	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3869	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.484 (Exibit 13-11)

S_R = 56.4 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp

☐ Yes ☐ On
☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	475
Deceleration Lane Length L_D	
Freeway Volume, V_F	3131
Ramp Volume, V_R	370
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☑ Yes ☑ On
☐ No ☐ Off

L_{down} = 1200 ft

V_D = 511 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3131	0.92	Level	2	0	0.990	1.00	3437
Ramp	370	0.92	Level	15	0	0.930	1.00	432
UpStream								
DownStream	511	0.92	Level	1	0	0.995	1.00	558

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3437 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3869	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3869	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.484 (Exibit 13-11)

S_R = 56.4 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3162	
	Ramp Volume, V_R: 968	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3162	0.92	Level	4	0	0.980	1.00	3506
Ramp	968	0.92	Level	6	0	0.971	1.00	1084
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2069 pc/h

V_3 or V_{av34} = 1437 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2069 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4590	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3153	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.372 (Exibit 13-11)

S_R = 59.6 mph (Exhibit 13-11)

S_0 = 66.6 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	750 veh/h	Freeway Volume, V_F	4996	V_D =	veh/h
		Ramp Volume, V_R	732		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4996	0.92	Level	12	0	0.943	1.00	5756
Ramp	732	0.92	Level	9	0	0.957	1.00	831
UpStream	750	0.92	Level	2	0	0.990	1.00	823
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3405 pc/h

V_3 or V_{av34} = 2351 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3405 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6587	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4236	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 35.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.546 (Exibit 13-11)

S_R = 54.7 mph (Exhibit 13-11)

S_0 = 63.2 mph (Exhibit 13-11)

S = 57.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	4186	V_D =	797 veh/h
		Ramp Volume, V_R	688		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4186	0.92	Level	16	0	0.926	1.00	4914
Ramp	688	0.92	Level	11	0	0.948	1.00	789
UpStream								
DownStream	797	0.92	Level	4	0	0.980	1.00	884

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.601 using Equation (Exhibit 13-7)

V_{12} = 3268 pc/h

V_3 or V_{av34} 1646 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4914	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4125	Exhibit 13-8	7200	No
V_R	789	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3268	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.369 (Exhibit 13-12)

S_R = 59.7 mph (Exhibit 13-12)

S_0 = 74.3 mph (Exhibit 13-12)

S = 63.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	4	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2200 ft	Acceleration Lane Length, L_A	750	L_{down} =	ft
V_u =	766 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	5754		
		Ramp Volume, V_R	644		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5754	0.92	Level	1	0	0.995	1.00	6286
Ramp	644	0.92	Level	17	0	0.922	1.00	759
UpStream	766	0.92	Level	22	0	0.901	1.00	924
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.123 using Equation (Exhibit 13-6)

V_{12} = 773 pc/h

V_3 or V_{av34} = 2756 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2514 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7045	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3273	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.356 (Exibit 13-11)

S_R = 60.0 mph (Exhibit 13-11)

S_0 = 65.0 mph (Exhibit 13-11)

S = 62.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	175
Freeway Volume, V_F	6520
Ramp Volume, V_R	766
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2200 ft; V_D = 644 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6520	0.92	Level	3	0	0.985	1.00	7193
Ramp	766	0.92	Level	22	0	0.901	1.00	924
UpStream								
DownStream	644	0.92	Level	17	0	0.922	1.00	759

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3657 pc/h

V_3 or V_{av34} 1768 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7193	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6269	Exhibit 13-8	9600	No
V_R	924	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3657	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.381 (Exhibit 13-12)

S_R = 59.3 mph (Exhibit 13-12)

S_0 = 73.8 mph (Exhibit 13-12)

S = 65.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	220
Freeway Volume, V_F	6510
Ramp Volume, V_R	563
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2115 ft; V_D = 654 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6510	0.92	Level	6	0	0.971	1.00	7288
Ramp	563	0.92	Level	20	0	0.909	1.00	673
UpStream								
DownStream	654	0.92	Level	19	0	0.913	1.00	778

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3557 pc/h

V_3 or V_{av34} 1865 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7288	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6615	Exhibit 13-8	9600	No
V_R	673	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3557	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.359 (Exhibit 13-12)

S_R = 60.0 mph (Exhibit 13-12)

S_0 = 73.4 mph (Exhibit 13-12)

S = 66.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway / Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	4	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2115 ft	Acceleration Lane Length, L_A	500	L_{down} =	ft
V_u =	563 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	5947		
		Ramp Volume, V_R	654		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5947	0.92	Level	5	0	0.976	1.00	6626
Ramp	654	0.92	Level	19	0	0.913	1.00	778
UpStream	563	0.92	Level	20	0	0.909	1.00	673
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.121 using Equation (Exhibit 13-6)

V_{12} = 799 pc/h

V_3 or V_{av34} = 2913 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2650 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7404	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3428	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.396 (Exibit 13-11)

S_R = 58.9 mph (Exhibit 13-11)

S_0 = 64.6 mph (Exhibit 13-11)

S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3347	V_D =	veh/h
		Ramp Volume, V_R	1229		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3347	0.92	Level	3	0	0.985	1.00	3693
Ramp	1229	0.92	Level	4	0	0.980	1.00	1363
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.605 using Equation (Exhibit 13-7)

V_{12} = 2773 pc/h

V_3 or V_{av34} 920 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3693	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2330	Exhibit 13-8	7200	No
V_R	1363	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2773	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.421 (Exhibit 13-12)

S_R = 58.2 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 62.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3418	V_D =	325 veh/h
		Ramp Volume, V_R	1489		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3418	0.92	Level	3	0	0.985	1.00	3771
Ramp	1489	0.92	Level	4	0	0.980	1.00	1651
UpStream								
DownStream	325	0.92	Level	3	0	0.985	1.00	359

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.590 using Equation (Exhibit 13-7)

V_{12} = 2901 pc/h

V_3 or V_{av34} 870 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3771	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2120	Exhibit 13-8	7200	No
V_R	1651	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2901	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.447 (Exhibit 13-12)

S_R= 57.5 mph (Exhibit 13-12)

S_0= 76.8 mph (Exhibit 13-12)

S = 61.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 1460 ft
V_u = 952 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	475
Deceleration Lane Length L_D	
Freeway Volume, V_F	2596
Ramp Volume, V_R	605
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2596	0.92	Level	1	0	0.995	1.00	2836
Ramp	605	0.92	Level	6	0	0.971	1.00	677
UpStream	952	0.92	Level	4	0	0.980	1.00	1055
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 2836 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3513	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3513	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
D_R = 29.6 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.428 (Exibit 13-11)
S_R = 58.0 mph (Exhibit 13-11)
S_0 = N/A mph (Exhibit 13-11)
S = 58.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	475
Deceleration Lane Length L_D	
Freeway Volume, V_F	2596
Ramp Volume, V_R	605
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 1200 ft
V_D = 65 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2596	0.92	Level	1	0	0.995	1.00	2836
Ramp	605	0.92	Level	6	0	0.971	1.00	677
UpStream								
DownStream	65	0.92	Level	8	0	0.962	1.00	73

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 2836 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3513	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3513	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
D_R = 29.6 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.428 (Exibit 13-11)
S_R = 58.0 mph (Exhibit 13-11)
S_0 = N/A mph (Exhibit 13-11)
S = 58.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3136	
	Ramp Volume, V_R: 975	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3136	0.92	Level	4	0	0.980	1.00	3477
Ramp	975	0.92	Level	5	0	0.976	1.00	1086
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2052 pc/h

V_3 or V_{av34} = 1425 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2052 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4563	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3138	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.370 (Exibit 13-11)

S_R = 59.6 mph (Exhibit 13-11)

S_0 = 66.7 mph (Exhibit 13-11)

S = 61.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	363 veh/h	Freeway Volume, V_F	4627	V_D =	veh/h
		Ramp Volume, V_R	527		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4627	0.92	Level	8	0	0.962	1.00	5231
Ramp	527	0.92	Level	11	0	0.948	1.00	604
UpStream	363	0.92	Level	2	0	0.990	1.00	399
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3094 pc/h

V_3 or V_{av34} = 2137 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3094 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5835	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3698	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.433 (Exibit 13-11)

S_R = 57.9 mph (Exhibit 13-11)

S_0 = 64.1 mph (Exhibit 13-11)

S = 60.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	4288	V_D =	450 veh/h
		Ramp Volume, V_R	1146		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4288	0.92	Level	12	0	0.943	1.00	4941
Ramp	1146	0.92	Level	8	0	0.962	1.00	1295
UpStream								
DownStream	450	0.92	Level	2	0	0.990	1.00	494

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.577 using Equation (Exhibit 13-7)

V_{12} = 3398 pc/h

V_3 or V_{av34} 1543 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4941	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3646	Exhibit 13-8	7200	No
V_R	1295	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3398	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.415 (Exhibit 13-12)

S_R = 58.4 mph (Exhibit 13-12)

S_0 = 74.7 mph (Exhibit 13-12)

S = 62.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	750	☑ No	☐ Off
L_{up} =	2200 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	834 veh/h	Freeway Volume, V_F	5920	V_D =	veh/h
		Ramp Volume, V_R	703		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5920	0.92	Level	2	0	0.990	1.00	6499
Ramp	703	0.92	Level	12	0	0.943	1.00	810
UpStream	834	0.92	Level	10	0	0.952	1.00	952
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.117 using Equation (Exhibit 13-6)

V_{12} = 757 pc/h

V_3 or V_{av34} 2871 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 2599 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7309	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3409	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.371 (Exibit 13-11)

S_R= 59.6 mph (Exhibit 13-11)

S_0= 64.8 mph (Exhibit 13-11)

S = 62.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	6754	V_D =	703 veh/h
		Ramp Volume, V_R	834		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6754	0.92	Level	3	0	0.985	1.00	7451
Ramp	834	0.92	Level	10	0	0.952	1.00	952
UpStream								
DownStream	703	0.92	Level	12	0	0.943	1.00	810

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3786 pc/h

V_3 or V_{av34} 1832 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7451	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6499	Exhibit 13-8	9600	No
V_R	952	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3786	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.2 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)

S_R = 59.3 mph (Exhibit 13-12)

S_0 = 73.5 mph (Exhibit 13-12)

S = 65.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	220
Freeway Volume, V_F	5930
Ramp Volume, V_R	626
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2115 ft; V_D = 741 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5930	0.92	Level	4	0	0.980	1.00	6575
Ramp	626	0.92	Level	12	0	0.943	1.00	721
UpStream								
DownStream	741	0.92	Level	16	0	0.926	1.00	870

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3273 pc/h

V_3 or V_{av34} 1651 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6575	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5854	Exhibit 13-8	9600	No
V_R	721	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3273	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.363 (Exhibit 13-12)

S_R = 59.8 mph (Exhibit 13-12)

S_0 = 74.3 mph (Exhibit 13-12)

S = 66.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 2

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	2115 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	626 veh/h	Freeway Volume, V_F	5304	V_D =	veh/h
		Ramp Volume, V_R	741		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5304	0.92	Level	3	0	0.985	1.00	5852
Ramp	741	0.92	Level	16	0	0.926	1.00	870
UpStream	626	0.92	Level	12	0	0.943	1.00	721
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.109 using Equation (Exhibit 13-6)

V_{12} = 638 pc/h

V_3 or V_{av34} 2607 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2340 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6722	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3210	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.373 (Exibit 13-11)

S_R = 59.6 mph (Exhibit 13-11)

S_0 = 65.5 mph (Exhibit 13-11)

S = 62.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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APPENDIX 5.15:

E+P (PROJECT BUILDOUT) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3
Project Description	Kimball Business Center TIA (JN 09774)		

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3831	V_D =	veh/h
		Ramp Volume, V_R	876		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3831	0.92	Level	4	0	0.980	1.00	4247
Ramp	876	0.92	Level	11	0	0.948	1.00	1005
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.608 using Equation (Exhibit 13-7)

V_{12} = 2975 pc/h

V_3 or V_{av34} 1272 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4247	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3242	Exhibit 13-8	7200	No
V_R	1005	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2975	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.388 (Exhibit 13-12)

S_R= 59.1 mph (Exhibit 13-12)

S_0= 75.7 mph (Exhibit 13-12)

S = 63.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 169 veh/h
	Freeway Volume, V_F: 3548	
	Ramp Volume, V_R: 760	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3548	0.92	Level	4	0	0.980	1.00	3934
Ramp	760	0.92	Level	11	0	0.948	1.00	872
UpStream								
DownStream	169	0.92	Level	19	0	0.913	1.00	201

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.622 using Equation (Exhibit 13-7)

V_{12} = 2775 pc/h

V_3 or V_{av34} 1159 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3934	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3062	Exhibit 13-8	7200	No
V_R	872	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2775	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 26.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.376 (Exhibit 13-12)

S_R= 59.5 mph (Exhibit 13-12)

S_0= 76.2 mph (Exhibit 13-12)

S = 63.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 264 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3131	
	Ramp Volume, V_R: 379	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3131	0.92	Level	2	0	0.990	1.00	3437
Ramp	379	0.92	Level	15	0	0.930	1.00	443
UpStream	264	0.92	Level	11	0	0.948	1.00	303
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3437 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3880	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3880	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.486 (Exibit 13-11)

S_R = 56.4 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 511 veh/h
	Freeway Volume, V_F: 3131	
	Ramp Volume, V_R: 379	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3131	0.92	Level	2	0	0.990	1.00	3437
Ramp	379	0.92	Level	15	0	0.930	1.00	443
UpStream								
DownStream	511	0.92	Level	1	0	0.995	1.00	558

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3437 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3880	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3880	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.486 (Exibit 13-11)

S_R = 56.4 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3168	
	Ramp Volume, V_R: 971	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3168	0.92	Level	4	0	0.980	1.00	3512
Ramp	971	0.92	Level	6	0	0.971	1.00	1087
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2072 pc/h

V_3 or V_{av34} = 1440 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2072 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4599	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3159	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 26.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.372 (Exibit 13-11)

S_R = 59.6 mph (Exhibit 13-11)

S_0 = 66.6 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☐ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1170 ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = 750 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4996	
	Ramp Volume, V_R: 738	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4996	0.92	Level	12	0	0.943	1.00	5756
Ramp	738	0.92	Level	9	0	0.957	1.00	838
UpStream	750	0.92	Level	2	0	0.990	1.00	823
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3405 pc/h

V_3 or V_{av34} = 2351 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3405 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6594	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4243	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 35.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.548 (Exibit 13-11)

S_R = 54.7 mph (Exhibit 13-11)

S_0 = 63.2 mph (Exhibit 13-11)

S = 57.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 797 veh/h
	Freeway Volume, V_F: 4236	
	Ramp Volume, V_R: 738	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4236	0.92	Level	16	0	0.926	1.00	4973
Ramp	738	0.92	Level	11	0	0.948	1.00	846
UpStream								
DownStream	797	0.92	Level	4	0	0.980	1.00	884

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.597 using Equation (Exhibit 13-7)

V_{12} = 3309 pc/h

V_3 or V_{av34} 1664 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4973	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4127	Exhibit 13-8	7200	No
V_R	846	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3309	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.374 (Exhibit 13-12)

S_R = 59.5 mph (Exhibit 13-12)

S_0 = 74.2 mph (Exhibit 13-12)

S = 63.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2200 ft
- V_u = 789 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	5754
Ramp Volume, V_R	648
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5754	0.92	Level	1	0	0.995	1.00	6286
Ramp	648	0.92	Level	17	0	0.922	1.00	764
UpStream	789	0.92	Level	23	0	0.897	1.00	956
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.122 using Equation (Exhibit 13-6)

V_{12} = 769 pc/h

V_3 or V_{av34} = 2758 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2514 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7050	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3278	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.357 (Exibit 13-11)

S_R = 60.0 mph (Exhibit 13-11)

S_0 = 65.0 mph (Exhibit 13-11)

S = 62.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 648 veh/h
	Freeway Volume, V_F: 6543	
	Ramp Volume, V_R: 789	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6543	0.92	Level	4	0	0.980	1.00	7254
Ramp	789	0.92	Level	23	0	0.897	1.00	956
UpStream								
DownStream	648	0.92	Level	17	0	0.922	1.00	764

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3702 pc/h

V_3 or V_{av34} 1776 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7254	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6298	Exhibit 13-8	9600	No
V_R	956	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3702	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)

S_R = 59.2 mph (Exhibit 13-12)

S_0 = 73.8 mph (Exhibit 13-12)

S = 65.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 659 veh/h
	Freeway Volume, V_F: 6528	
	Ramp Volume, V_R: 581	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6528	0.92	Level	6	0	0.971	1.00	7309
Ramp	581	0.92	Level	20	0	0.909	1.00	695
UpStream								
DownStream	659	0.92	Level	20	0	0.909	1.00	788

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3579 pc/h

V_3 or V_{av34} 1865 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7309	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6614	Exhibit 13-8	9600	No
V_R	695	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3579	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.361 (Exhibit 13-12)

S_R = 59.9 mph (Exhibit 13-12)

S_0 = 73.4 mph (Exhibit 13-12)

S = 66.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2115 ft
- V_u = 581 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5947
Ramp Volume, V_R	659
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5947	0.92	Level	5	0	0.976	1.00	6626
Ramp	659	0.92	Level	20	0	0.909	1.00	788
UpStream	581	0.92	Level	20	0	0.909	1.00	695
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.119 using Equation (Exhibit 13-6)

V_{12} = 790 pc/h

V_3 or V_{av34} = 2918 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2650 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7414	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3438	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.397 (Exibit 13-11)

S_R = 58.9 mph (Exhibit 13-11)

S_0 = 64.6 mph (Exhibit 13-11)

S = 61.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3
Project Description	Kimball Business Center TIA (JN 09774)		

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 3361	
	Ramp Volume, V_R: 1235	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3361	0.92	Level	3	0	0.985	1.00	3708
Ramp	1235	0.92	Level	4	0	0.980	1.00	1369
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.604 using Equation (Exhibit 13-7)

V_{12} = 2783 pc/h

V_3 or V_{av34} 925 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3708	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2339	Exhibit 13-8	7200	No
V_R	1369	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2783	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.421 (Exhibit 13-12)

S_R = 58.2 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 61.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 325 veh/h
	Freeway Volume, V_F: 3426	
	Ramp Volume, V_R: 1497	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3426	0.92	Level	3	0	0.985	1.00	3780
Ramp	1497	0.92	Level	4	0	0.980	1.00	1660
UpStream								
DownStream	325	0.92	Level	3	0	0.985	1.00	359

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.589 using Equation (Exhibit 13-7)

V_{12} = 2909 pc/h

V_3 or V_{av34} 871 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3780	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2120	Exhibit 13-8	7200	No
V_R	1660	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2909	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.447 (Exhibit 13-12)

S_R = 57.5 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 61.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 952 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2596	
	Ramp Volume, V_R: 648	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2596	0.92	Level	1	0	0.995	1.00	2836
Ramp	648	0.92	Level	7	0	0.966	1.00	729
UpStream	952	0.92	Level	4	0	0.980	1.00	1055
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2836 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3565	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3565	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 30.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.435 (Exibit 13-11)

S_R = 57.8 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 57.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 65 veh/h
	Freeway Volume, V_F: 2596	
	Ramp Volume, V_R: 648	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2596	0.92	Level	1	0	0.995	1.00	2836
Ramp	648	0.92	Level	7	0	0.966	1.00	729
UpStream								
DownStream	65	0.92	Level	8	0	0.962	1.00	73

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2836 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3565	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3565	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 30.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.435 (Exibit 13-11)

S_R = 57.8 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 57.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3161	
	Ramp Volume, V_R: 992	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3161	0.92	Level	5	0	0.976	1.00	3522
Ramp	992	0.92	Level	5	0	0.976	1.00	1105
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2078 pc/h

V_3 or V_{av34} = 1444 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2078 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4627	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3183	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 27.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.375 (Exibit 13-11)

S_R = 59.5 mph (Exhibit 13-11)

S_0 = 66.6 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	363 veh/h	Freeway Volume, V_F	4627	V_D =	veh/h
		Ramp Volume, V_R	552		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4627	0.92	Level	8	0	0.962	1.00	5231
Ramp	552	0.92	Level	12	0	0.943	1.00	636
UpStream	363	0.92	Level	2	0	0.990	1.00	399
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3094 pc/h

V_3 or V_{av34} = 2137 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3094 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5867	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3730	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.439 (Exibit 13-11)

S_R = 57.7 mph (Exhibit 13-11)

S_0 = 64.1 mph (Exhibit 13-11)

S = 59.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 450 veh/h
	Freeway Volume, V_F: 4303	
	Ramp Volume, V_R: 1161	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4303	0.92	Level	12	0	0.943	1.00	4958
Ramp	1161	0.92	Level	8	0	0.962	1.00	1312
UpStream								
DownStream	450	0.92	Level	2	0	0.990	1.00	494

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.576 using Equation (Exhibit 13-7)

V_{12} = 3411 pc/h

V_3 or V_{av34} 1547 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4958	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3646	Exhibit 13-8	7200	No
V_R	1312	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3411	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.416 (Exhibit 13-12)

S_R= 58.3 mph (Exhibit 13-12)

S_0= 74.7 mph (Exhibit 13-12)

S = 62.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 840 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	5920
Ramp Volume, V_R	719
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5920	0.92	Level	2	0	0.990	1.00	6499
Ramp	719	0.92	Level	13	0	0.939	1.00	832
UpStream	840	0.92	Level	11	0	0.948	1.00	963
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.114 using Equation (Exhibit 13-6)
V_{12} = 740 pc/h
V_3 or V_{av34} = 2879 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2599 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7331	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3431	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.2 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.374 (Exibit 13-11)
S_R = 59.5 mph (Exhibit 13-11)
S_0 = 64.8 mph (Exhibit 13-11)
S = 62.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	175
Freeway Volume, V_F	6760
Ramp Volume, V_R	840
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 2200 ft
V_D = 719 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6760	0.92	Level	3	0	0.985	1.00	7458
Ramp	840	0.92	Level	11	0	0.948	1.00	963
UpStream								
DownStream	719	0.92	Level	13	0	0.939	1.00	832

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 0.436 using Equation (Exhibit 13-7)
V_{12} = 3795 pc/h
V_3 or V_{av34} 1831 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7458	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6495	Exhibit 13-8	9600	No
V_R	963	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3795	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 35.3 (pc/mi/ln)
LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.385 (Exhibit 13-12)
S_R= 59.2 mph (Exhibit 13-12)
S_0= 73.5 mph (Exhibit 13-12)
S = 65.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	220
Freeway Volume, V_F	5935
Ramp Volume, V_R	631
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2115 ft; V_D = 761 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5935	0.92	Level	4	0	0.980	1.00	6580
Ramp	631	0.92	Level	12	0	0.943	1.00	727
UpStream								
DownStream	761	0.92	Level	17	0	0.922	1.00	897

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3279 pc/h

V_3 or V_{av34} 1650 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6580	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5853	Exhibit 13-8	9600	No
V_R	727	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3279	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.363 (Exhibit 13-12)

S_R = 59.8 mph (Exhibit 13-12)

S_0 = 74.3 mph (Exhibit 13-12)

S = 66.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/12/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P Phase 3

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 631 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5304
Ramp Volume, V_R	761
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5304	0.92	Level	3	0	0.985	1.00	5852
Ramp	761	0.92	Level	17	0	0.922	1.00	897
UpStream	631	0.92	Level	12	0	0.943	1.00	727
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.106 using Equation (Exhibit 13-6)
V_{12} = 618 pc/h
V_3 or V_{av34} = 2617 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2340 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6749	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3237	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.2 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.375 (Exibit 13-11)
S_R = 59.5 mph (Exhibit 13-11)
S_0 = 65.5 mph (Exhibit 13-11)
S = 62.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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APPENDIX 5.16:

E+P (PHASE 2) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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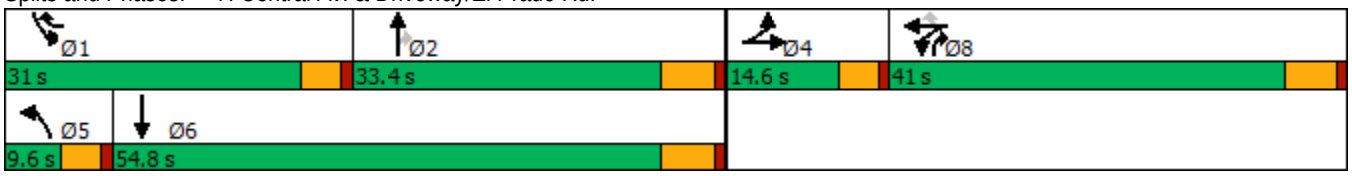
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	900	3	444	2	738	562	353	603
Future Volume (vph)	1	1	900	3	444	2	738	562	353	603
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	41.0	41.0	31.0	9.6	33.4	41.0	31.0	54.8
Total Split (%)	12.2%	12.2%	34.2%	34.2%	25.8%	8.0%	27.8%	34.2%	25.8%	45.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	35.3	35.3	67.6	5.0	27.7	63.0	26.5	57.0
Actuated g/C Ratio	0.09	0.09	0.33	0.33	0.62	0.05	0.26	0.58	0.24	0.53
v/c Ratio	0.01	0.01	1.00	0.95	0.46	0.03	0.94	0.59	0.99	0.26
Control Delay	48.0	41.0	78.3	65.0	6.0	53.0	59.1	5.7	86.1	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	78.3	65.0	6.0	53.0	59.1	5.7	86.1	15.6
LOS	D	D	E	E	A	D	E	A	F	B
Approach Delay		43.3		50.0			36.1			41.4
Approach LOS		D		D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 42.7	Intersection LOS: D
Intersection Capacity Utilization 91.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	900	3	444	2	738	562	353	603	9
Future Volume (veh/h)	1	1	1	900	3	444	2	738	562	353	603	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1002	0	350	2	820	455	392	670	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1028	0	850	4	851	862	385	2424	29
Arrive On Green	0.01	0.01	0.01	0.32	0.00	0.32	0.00	0.25	0.25	0.24	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5006	60
Grp Volume(v), veh/h	1	0	2	1002	0	350	2	820	455	392	438	240
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	33.9	0.0	14.6	0.1	26.3	20.7	26.4	8.8	8.8
Cycle Q Clear(g_c), s	0.1	0.0	0.1	33.9	0.0	14.6	0.1	26.3	20.7	26.4	8.8	8.8
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1028	0	850	4	851	862	385	1587	867
V/C Ratio(X)	0.08	0.00	0.15	0.97	0.00	0.41	0.46	0.96	0.53	1.02	0.28	0.28
Avail Cap(c_a), veh/h	146	0	149	1028	0	850	73	851	862	385	1587	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	37.4	0.0	14.2	55.2	41.1	14.9	42.2	17.0	17.0
Incr Delay (d2), s/veh	0.9	0.0	2.0	22.1	0.0	0.3	25.4	23.1	2.3	50.2	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	18.3	0.0	6.2	0.1	15.1	14.3	17.0	4.1	4.5
LnGrp Delay(d),s/veh	55.5	0.0	56.6	59.5	0.0	14.5	80.6	64.3	17.2	92.5	17.5	17.8
LnGrp LOS	E		E	E		B	F	E	B	F	B	B
Approach Vol, veh/h		3			1352			1277			1070	
Approach Delay, s/veh		56.2			47.8			47.5			45.0	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	31.0	33.4		5.5	4.9	59.5		41.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	26.4	27.6		10.0	5.0	49.0		35.2
Max Q Clear Time (g_c+I1), s	28.4	28.3		2.1	2.1	10.8		35.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	6.4		0.0

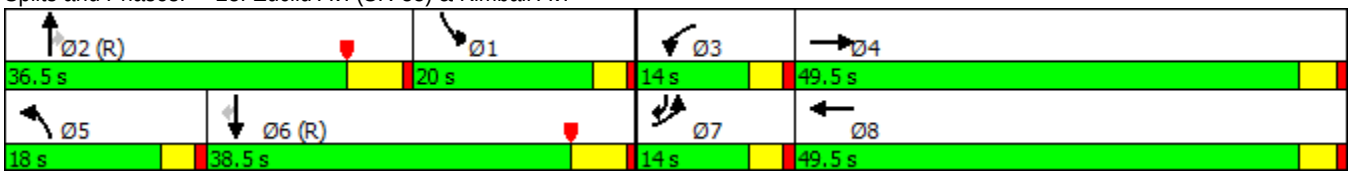
Intersection Summary	
HCM 2010 Ctrl Delay	46.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	135	312	33	648	97	652	49	304	598	310
Future Volume (vph)	135	312	33	648	97	652	49	304	598	310
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	5	2		1	6	7
Permitted Phases							2			6
Detector Phase	7	4	3	8	5	2	2	1	6	7
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	14.0	49.5	14.0	49.5	18.0	36.5	36.5	20.0	38.5	14.0
Total Split (%)	11.7%	41.3%	11.7%	41.3%	15.0%	30.4%	30.4%	16.7%	32.1%	11.7%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	10.0	44.2	10.0	38.6	11.9	32.6	32.6	20.4	41.0	53.0
Actuated g/C Ratio	0.08	0.37	0.08	0.32	0.10	0.27	0.27	0.17	0.34	0.44
v/c Ratio	0.56	0.28	0.25	0.87	0.62	0.72	0.10	1.13	0.52	0.41
Control Delay	62.4	27.0	56.7	44.5	65.2	53.7	11.2	139.9	40.8	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	27.0	56.7	44.5	65.2	53.7	11.2	139.9	40.8	22.8
LOS	E	C	E	D	E	D	B	F	D	C
Approach Delay		37.1		45.0		52.5			61.1	
Approach LOS		D		D		D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 65 (54%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 51.3	Intersection LOS: D
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	312	25	33	648	282	97	652	49	304	598	310
Future Volume (veh/h)	135	312	25	33	648	282	97	652	49	304	598	310
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	138	318	24	34	661	266	99	665	42	310	610	278
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	244	1098	82	91	749	301	130	769	344	336	1261	683
Arrive On Green	0.08	0.34	0.34	0.06	0.31	0.31	0.03	0.07	0.07	0.21	0.37	0.37
Sat Flow, veh/h	2956	3225	242	1619	2382	959	1619	3420	1530	1619	3420	1511
Grp Volume(v), veh/h	138	168	174	34	474	453	99	665	42	310	610	278
Grp Sat Flow(s),veh/h/ln	1478	1710	1757	1619	1710	1631	1619	1710	1530	1619	1710	1511
Q Serve(g_s), s	5.4	8.6	8.7	2.4	31.6	31.6	7.3	23.1	2.5	22.5	16.4	14.9
Cycle Q Clear(g_c), s	5.4	8.6	8.7	2.4	31.6	31.6	7.3	23.1	2.5	22.5	16.4	14.9
Prop In Lane	1.00		0.14	1.00		0.59	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	582	598	91	538	513	130	769	344	336	1261	683
V/C Ratio(X)	0.57	0.29	0.29	0.37	0.88	0.88	0.76	0.86	0.12	0.92	0.48	0.41
Avail Cap(c_a), veh/h	246	641	659	135	641	612	189	869	389	336	1261	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	0.84	0.84	0.84	0.73	0.73	0.73
Uniform Delay (d), s/veh	53.0	28.9	29.0	54.6	39.0	39.0	57.3	53.7	29.9	46.6	29.1	22.2
Incr Delay (d2), s/veh	1.7	0.3	0.3	0.9	10.8	11.3	4.5	10.8	0.6	24.0	1.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.1	4.3	1.1	16.5	15.8	3.4	12.1	1.1	12.3	8.0	6.4
LnGrp Delay(d),s/veh	54.7	29.2	29.2	55.5	49.9	50.3	61.7	64.5	30.5	70.6	30.1	23.5
LnGrp LOS	D	C	C	E	D	D	E	E	C	E	C	C
Approach Vol, veh/h		480			961			806			1198	
Approach Delay, s/veh		36.5			50.3			62.4			39.0	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.9	33.0	10.8	45.4	13.6	50.2	13.9	42.2
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.0	* 31	10.0	45.0	14.0	32.5	10.0	45.0
Max Q Clear Time (g_c+I1), s	24.5	25.1	4.4	10.7	9.3	18.4	7.4	33.6
Green Ext Time (p_c), s	0.0	1.9	0.0	5.7	0.0	4.2	0.1	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	47.3
HCM 2010 LOS	D

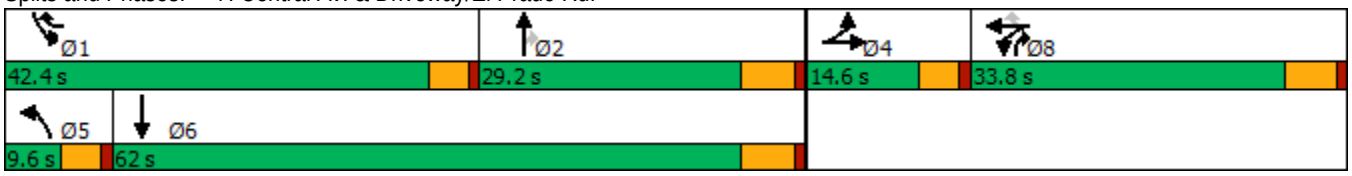
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	5	571	4	398	9	550	681	508	682
Future Volume (vph)	25	5	571	4	398	9	550	681	508	682
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.4	9.6	29.2	33.8	42.4	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.3%	8.0%	24.3%	28.2%	35.3%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.1	10.1	25.9	25.9	69.8	5.0	23.6	49.5	38.1	64.6
Actuated g/C Ratio	0.09	0.09	0.23	0.23	0.62	0.04	0.21	0.44	0.34	0.58
v/c Ratio	0.18	0.16	0.84	0.80	0.40	0.12	0.80	0.83	0.96	0.26
Control Delay	54.0	26.6	63.6	58.8	6.0	59.3	52.7	20.7	69.2	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	26.6	63.6	58.8	6.0	59.3	52.7	20.7	69.2	13.8
LOS	D	C	E	E	A	E	D	C	E	B
Approach Delay		40.3		38.6			35.2			37.1
Approach LOS		D		D			D			D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 36.9 — Intersection LOS: D
Intersection Capacity Utilization 96.9% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	5	20	571	4	398	9	550	681	508	682	17
Future Volume (veh/h)	25	5	20	571	4	398	9	550	681	508	682	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	5	12	598	0	264	9	573	533	529	710	14
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	106	31	74	685	0	834	18	706	635	540	2622	52
Arrive On Green	0.07	0.07	0.07	0.21	0.00	0.21	0.01	0.21	0.21	0.33	0.53	0.53
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4959	98
Grp Volume(v), veh/h	26	0	17	598	0	264	9	573	533	529	469	255
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.7	0.0	1.1	20.3	0.0	10.8	0.6	18.1	23.4	36.7	8.9	8.9
Cycle Q Clear(g_c), s	1.7	0.0	1.1	20.3	0.0	10.8	0.6	18.1	23.4	36.7	8.9	8.9
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	106	0	105	685	0	834	18	706	635	540	1732	941
V/C Ratio(X)	0.25	0.00	0.16	0.87	0.00	0.32	0.51	0.81	0.84	0.98	0.27	0.27
Avail Cap(c_a), veh/h	143	0	141	800	0	888	71	706	635	540	1732	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.3	0.0	50.1	43.2	0.0	14.2	55.8	42.9	26.0	37.4	14.7	14.7
Incr Delay (d2), s/veh	0.4	0.0	0.3	9.4	0.0	0.2	8.2	9.9	12.6	33.5	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	9.9	0.0	4.6	0.3	9.5	18.8	21.3	4.1	4.6
LnGrp Delay(d),s/veh	50.8	0.0	50.3	52.7	0.0	14.4	64.0	52.8	38.7	70.9	15.1	15.4
LnGrp LOS	D		D	D		B	E	D	D	E	B	B
Approach Vol, veh/h		43			862			1115			1253	
Approach Delay, s/veh		50.6			40.9			46.1			38.7	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.4	29.2		12.0	5.8	65.8		29.8
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.8	23.4		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	38.7	25.4		3.7	2.6	10.9		22.3
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	7.1		1.7

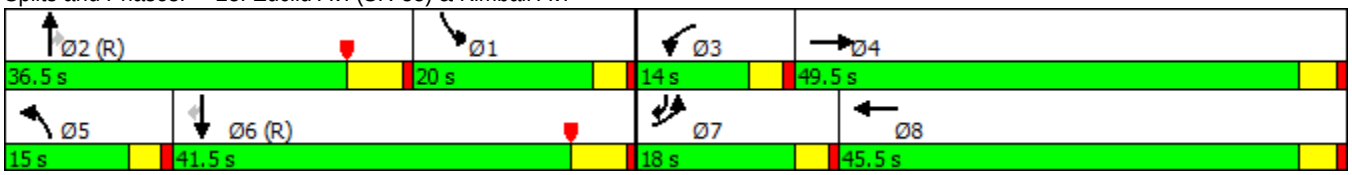
Intersection Summary	
HCM 2010 Ctrl Delay	42.0
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	307	789	46	325	66	685	30	307	674	82
Future Volume (vph)	307	789	46	325	66	685	30	307	674	82
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	5	2		1	6	7
Permitted Phases							2			6
Detector Phase	7	4	3	8	5	2	2	1	6	7
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	18.0	49.5	14.0	45.5	15.0	36.5	36.5	20.0	41.5	18.0
Total Split (%)	15.0%	41.3%	11.7%	37.9%	12.5%	30.4%	30.4%	16.7%	34.6%	15.0%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	14.0	38.4	10.0	31.6	10.4	36.0	36.0	19.9	48.3	64.3
Actuated g/C Ratio	0.12	0.32	0.08	0.26	0.09	0.30	0.30	0.17	0.40	0.54
v/c Ratio	0.93	0.80	0.36	0.64	0.49	0.70	0.06	1.20	0.51	0.10
Control Delay	86.5	43.0	60.0	28.3	55.0	53.8	6.3	172.0	44.6	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.5	43.0	60.0	28.3	55.0	53.8	6.3	172.0	44.6	9.7
LOS	F	D	E	C	E	D	A	F	D	A
Approach Delay		54.7		30.5		52.1			78.7	
Approach LOS		D		C		D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 60 (50%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 56.8	Intersection LOS: E
Intersection Capacity Utilization 87.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	789	48	46	325	283	66	685	30	307	674	82
Future Volume (veh/h)	307	789	48	46	325	283	66	685	30	307	674	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	320	822	46	48	339	261	69	714	16	320	702	67
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	345	995	56	108	468	354	121	806	361	364	1375	786
Arrive On Green	0.12	0.30	0.30	0.07	0.25	0.25	0.02	0.08	0.08	0.22	0.40	0.40
Sat Flow, veh/h	2956	3293	184	1619	1858	1404	1619	3420	1530	1619	3420	1511
Grp Volume(v), veh/h	320	427	441	48	311	289	69	714	16	320	702	67
Grp Sat Flow(s),veh/h/ln	1478	1710	1767	1619	1710	1552	1619	1710	1530	1619	1710	1511
Q Serve(g_s), s	12.9	27.8	27.9	3.4	20.0	20.5	5.1	24.8	0.9	22.9	18.5	2.7
Cycle Q Clear(g_c), s	12.9	27.8	27.9	3.4	20.0	20.5	5.1	24.8	0.9	22.9	18.5	2.7
Prop In Lane	1.00		0.10	1.00		0.90	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	345	517	534	108	431	391	121	806	361	364	1375	786
V/C Ratio(X)	0.93	0.83	0.83	0.45	0.72	0.74	0.57	0.89	0.04	0.88	0.51	0.09
Avail Cap(c_a), veh/h	345	641	663	135	584	530	148	869	389	364	1375	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	0.82	0.82	0.82	0.92	0.92	0.92
Uniform Delay (d), s/veh	52.5	38.9	38.9	53.9	41.0	41.2	56.6	53.7	27.7	44.9	27.0	14.5
Incr Delay (d2), s/veh	23.8	5.2	5.1	1.1	1.5	2.1	1.3	11.6	0.2	19.0	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	13.9	14.4	1.6	9.6	9.0	2.3	13.1	0.4	12.1	9.0	1.2
LnGrp Delay(d),s/veh	76.3	44.2	44.0	55.0	42.6	43.3	57.9	65.4	27.9	63.9	28.2	14.7
LnGrp LOS	E	D	D	D	D	D	E	E	C	E	C	B
Approach Vol, veh/h		1188			648			799			1089	
Approach Delay, s/veh		52.8			43.8			64.0			37.9	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.0	34.3	12.0	40.8	13.0	54.3	18.0	34.7
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.0	* 31	10.0	45.0	11.0	35.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	24.9	26.8	5.4	29.9	7.1	20.5	14.9	22.5
Green Ext Time (p_c), s	0.0	1.5	0.0	6.4	0.0	4.1	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.3
HCM 2010 LOS	D

Notes

APPENDIX 5.17:

E+P (PROJECT BUILDOUT) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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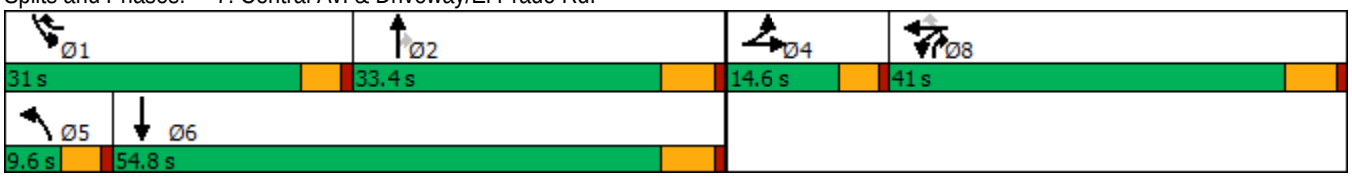
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	908	3	453	2	738	606	399	603
Future Volume (vph)	1	1	908	3	453	2	738	606	399	603
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	41.0	41.0	31.0	9.6	33.4	41.0	31.0	54.8
Total Split (%)	12.2%	12.2%	34.2%	34.2%	25.8%	8.0%	27.8%	34.2%	25.8%	45.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	35.3	35.3	67.6	5.0	27.7	63.0	26.5	57.0
Actuated g/C Ratio	0.09	0.09	0.33	0.33	0.62	0.05	0.26	0.58	0.24	0.53
v/c Ratio	0.01	0.01	1.01	0.96	0.47	0.03	0.94	0.64	1.12	0.26
Control Delay	48.0	41.0	80.2	66.9	6.2	53.0	59.1	7.3	122.2	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	80.2	66.9	6.2	53.0	59.1	7.3	122.2	15.6
LOS	D	D	F	E	A	D	E	A	F	B
Approach Delay		43.3		51.1			35.8			57.6
Approach LOS		D		D			D			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 108.3
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.12
Intersection Signal Delay: 47.3 — Intersection LOS: D
Intersection Capacity Utilization 94.5% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	908	3	453	2	738	606	399	603	9
Future Volume (veh/h)	1	1	1	908	3	453	2	738	606	399	603	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1011	0	360	2	820	504	443	670	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1028	0	850	4	851	862	385	2424	29
Arrive On Green	0.01	0.01	0.01	0.32	0.00	0.32	0.00	0.25	0.25	0.24	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5006	60
Grp Volume(v), veh/h	1	0	2	1011	0	360	2	820	504	443	438	240
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	34.4	0.0	15.2	0.1	26.3	24.1	26.4	8.8	8.8
Cycle Q Clear(g_c), s	0.1	0.0	0.1	34.4	0.0	15.2	0.1	26.3	24.1	26.4	8.8	8.8
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1028	0	850	4	851	862	385	1587	867
V/C Ratio(X)	0.08	0.00	0.15	0.98	0.00	0.42	0.46	0.96	0.58	1.15	0.28	0.28
Avail Cap(c_a), veh/h	146	0	149	1028	0	850	73	851	862	385	1587	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	37.6	0.0	14.3	55.2	41.1	15.6	42.2	17.0	17.0
Incr Delay (d2), s/veh	0.9	0.0	2.0	24.0	0.0	0.3	25.4	23.1	2.9	93.1	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	18.7	0.0	6.4	0.1	15.1	16.0	21.6	4.1	4.5
LnGrp Delay(d),s/veh	55.5	0.0	56.6	61.6	0.0	14.7	80.6	64.3	18.5	135.3	17.5	17.8
LnGrp LOS	E		E	E		B	F	E	B	F	B	B
Approach Vol, veh/h		3			1371			1326			1121	
Approach Delay, s/veh		56.2			49.3			46.9			64.1	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	31.0	33.4		5.5	4.9	59.5		41.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	26.4	27.6		10.0	5.0	49.0		35.2
Max Q Clear Time (g_c+I1), s	28.4	28.3		2.1	2.1	10.8		36.4
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	6.4		0.0

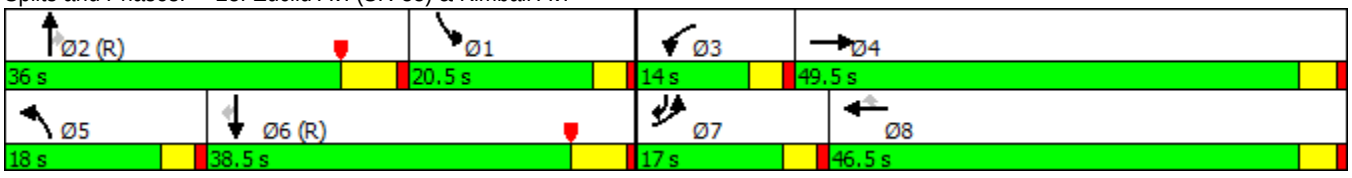
Intersection Summary	
HCM 2010 Ctrl Delay	52.8
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	135	399	36	664	308	97	653	63	445	603	310
Future Volume (vph)	135	399	36	664	308	97	653	63	445	603	310
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	45.5	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	17.0	49.5	14.0	46.5	46.5	18.0	36.0	36.0	20.5	38.5	17.0
Total Split (%)	14.2%	41.3%	11.7%	38.8%	38.8%	15.0%	30.0%	30.0%	17.1%	32.1%	14.2%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.5	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	10.9	37.1	10.0	30.6	30.6	11.9	38.8	38.8	21.2	48.1	61.0
Actuated g/C Ratio	0.09	0.31	0.08	0.26	0.26	0.10	0.32	0.32	0.18	0.40	0.51
v/c Ratio	0.52	0.41	0.28	0.78	0.50	0.62	0.60	0.11	0.82	0.45	0.37
Control Delay	59.1	33.5	57.3	47.5	6.2	48.3	30.1	3.3	49.3	17.6	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	33.5	57.3	47.5	6.2	48.3	30.1	3.3	49.3	17.6	6.1
LOS	E	C	E	D	A	D	C	A	D	B	A
Approach Delay		39.7		35.2			30.2			25.4	
Approach LOS		D		D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 33 (28%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 76.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	399	25	36	664	308	97	653	63	445	603	310
Future Volume (veh/h)	135	399	25	36	664	308	97	653	63	445	603	310
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	138	407	24	37	678	292	99	666	56	454	615	278
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	2	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	244	887	52	96	844	378	130	767	343	866	1492	785
Arrive On Green	0.08	0.27	0.27	0.06	0.25	0.25	0.03	0.07	0.07	0.28	0.44	0.44
Sat Flow, veh/h	2956	3283	193	1619	3420	1530	1619	3420	1530	3141	3420	1511
Grp Volume(v), veh/h	138	211	220	37	678	292	99	666	56	454	615	278
Grp Sat Flow(s),veh/h/ln	1478	1710	1766	1619	1710	1530	1619	1710	1530	1570	1710	1511
Q Serve(g_s), s	5.4	12.4	12.4	2.6	22.3	11.0	7.3	23.1	3.4	14.7	14.8	13.0
Cycle Q Clear(g_c), s	5.4	12.4	12.4	2.6	22.3	11.0	7.3	23.1	3.4	14.7	14.8	13.0
Prop In Lane	1.00		0.11	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	462	477	96	844	378	130	767	343	866	1492	785
V/C Ratio(X)	0.57	0.46	0.46	0.39	0.80	0.77	0.76	0.87	0.16	0.52	0.41	0.35
Avail Cap(c_a), veh/h	320	641	662	135	1197	535	189	855	382	866	1492	785
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	0.78	0.78	0.78	0.63	0.63	0.63
Uniform Delay (d), s/veh	53.0	36.5	36.5	54.4	42.5	11.3	57.3	53.8	30.0	36.8	23.3	17.0
Incr Delay (d2), s/veh	0.7	0.6	0.6	1.0	1.7	2.6	4.2	10.3	0.8	0.2	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.9	6.1	1.2	10.7	4.9	3.4	12.1	1.5	6.4	7.1	5.6
LnGrp Delay(d),s/veh	53.7	37.1	37.1	55.3	44.2	13.9	61.4	64.2	30.8	37.0	23.8	17.8
LnGrp LOS	D	D	D	E	D	B	E	E	C	D	C	B
Approach Vol, veh/h		569			1007			821			1347	
Approach Delay, s/veh		41.1			35.8			61.5			27.0	
Approach LOS		D			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.1	32.9	11.1	36.9	13.6	58.3	13.9	34.1
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.5	* 30	10.0	45.0	14.0	32.5	13.0	42.0
Max Q Clear Time (g_c+I1), s	16.7	25.1	4.6	14.4	9.3	16.8	7.4	24.3
Green Ext Time (p_c), s	0.0	1.8	0.0	6.0	0.0	4.8	0.1	5.3

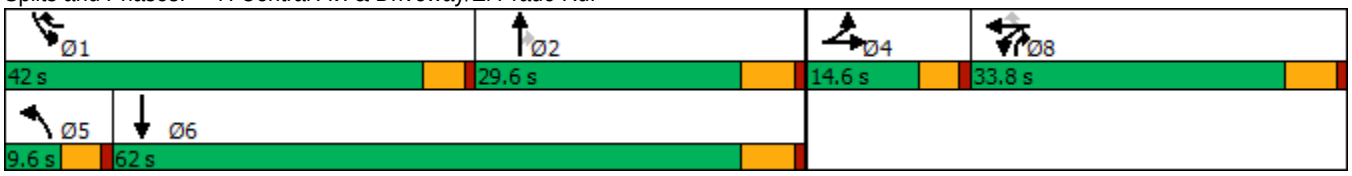
Intersection Summary	
HCM 2010 Ctrl Delay	39.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	5	609	4	437	9	550	694	522	682
Future Volume (vph)	25	5	609	4	437	9	550	694	522	682
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.0	9.6	29.6	33.8	42.0	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.0%	8.0%	24.7%	28.2%	35.0%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.1	10.1	26.7	26.7	70.2	5.0	24.0	50.7	37.6	64.4
Actuated g/C Ratio	0.09	0.09	0.24	0.24	0.62	0.04	0.21	0.45	0.33	0.57
v/c Ratio	0.18	0.16	0.87	0.83	0.44	0.12	0.79	0.84	1.01	0.26
Control Delay	54.1	26.6	67.4	61.2	7.1	59.4	52.3	21.8	80.8	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	26.6	67.4	61.2	7.1	59.4	52.3	21.8	80.8	14.0
LOS	D	C	E	E	A	E	D	C	F	B
Approach Delay		40.3		40.5			35.4			42.6
Approach LOS		D		D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.9	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 39.4	Intersection LOS: D
Intersection Capacity Utilization 98.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	5	20	609	4	437	9	550	694	522	682	17
Future Volume (veh/h)	25	5	20	609	4	437	9	550	694	522	682	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	5	12	637	0	304	9	573	547	544	710	14
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	105	31	73	716	0	836	18	709	651	527	2588	51
Arrive On Green	0.06	0.06	0.06	0.22	0.00	0.22	0.01	0.21	0.21	0.33	0.52	0.52
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4959	98
Grp Volume(v), veh/h	26	0	17	637	0	304	9	573	547	544	469	255
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.8	0.0	1.2	21.9	0.0	12.9	0.6	18.3	23.8	37.4	9.2	9.2
Cycle Q Clear(g_c), s	1.8	0.0	1.2	21.9	0.0	12.9	0.6	18.3	23.8	37.4	9.2	9.2
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	105	0	104	716	0	836	18	709	651	527	1710	929
V/C Ratio(X)	0.25	0.00	0.16	0.89	0.00	0.36	0.51	0.81	0.84	1.03	0.27	0.27
Avail Cap(c_a), veh/h	141	0	139	789	0	871	70	709	651	527	1710	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	0.0	50.7	43.4	0.0	14.7	56.5	43.4	25.6	38.7	15.3	15.3
Incr Delay (d2), s/veh	0.5	0.0	0.3	11.5	0.0	0.3	8.3	9.6	12.4	47.6	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	11.0	0.0	5.5	0.3	9.6	19.4	23.5	4.3	4.7
LnGrp Delay(d),s/veh	51.5	0.0	51.0	54.9	0.0	15.0	64.8	53.0	38.0	86.4	15.7	16.1
LnGrp LOS	D		D	D		B	E	D	D	F	B	B
Approach Vol, veh/h		43			941			1129			1268	
Approach Delay, s/veh		51.3			42.0			45.8			46.1	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.0	29.6		12.1	5.8	65.8		31.2
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.4	23.8		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.4	25.8		3.8	2.6	11.2		23.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	7.1		1.5

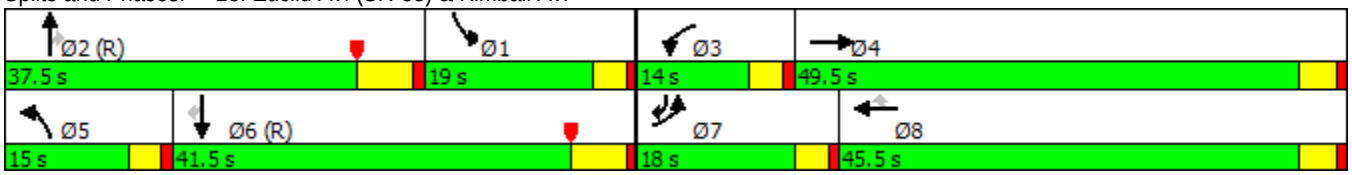
Intersection Summary	
HCM 2010 Ctrl Delay	44.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	307	815	59	398	403	66	690	34	349	675	82
Future Volume (vph)	307	815	59	398	403	66	690	34	349	675	82
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	45.5	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	18.0	49.5	14.0	45.5	45.5	15.0	37.5	37.5	19.0	41.5	18.0
Total Split (%)	15.0%	41.3%	11.7%	37.9%	37.9%	12.5%	31.3%	31.3%	15.8%	34.6%	15.0%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.5	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	14.7	38.8	10.0	31.3	31.3	10.4	39.2	39.2	16.3	47.9	64.6
Actuated g/C Ratio	0.12	0.32	0.08	0.26	0.26	0.09	0.33	0.33	0.14	0.40	0.54
v/c Ratio	0.89	0.82	0.46	0.47	0.68	0.49	0.64	0.06	0.86	0.52	0.10
Control Delay	78.3	43.5	63.9	37.7	15.7	43.0	30.6	3.9	72.0	31.3	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.3	43.5	63.9	37.7	15.7	43.0	30.6	3.9	72.0	31.3	11.0
LOS	E	D	E	D	B	D	C	A	E	C	B
Approach Delay		52.7		29.2			30.5			42.7	
Approach LOS		D		C			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 40.2	Intersection LOS: D
Intersection Capacity Utilization 80.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	815	48	59	398	403	66	690	34	349	675	82
Future Volume (veh/h)	307	815	48	59	398	403	66	690	34	349	675	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	320	849	46	61	415	386	69	719	20	364	703	67
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	345	1023	55	117	909	407	121	819	366	652	1328	765
Arrive On Green	0.12	0.31	0.31	0.07	0.27	0.27	0.02	0.08	0.08	0.21	0.39	0.39
Sat Flow, veh/h	2956	3300	179	1619	3420	1530	1619	3420	1530	3141	3420	1511
Grp Volume(v), veh/h	320	440	455	61	415	386	69	719	20	364	703	67
Grp Sat Flow(s),veh/h/ln	1478	1710	1768	1619	1710	1530	1619	1710	1530	1570	1710	1511
Q Serve(g_s), s	12.9	28.7	28.7	4.4	12.2	17.8	5.1	25.0	1.2	12.5	19.0	2.8
Cycle Q Clear(g_c), s	12.9	28.7	28.7	4.4	12.2	17.8	5.1	25.0	1.2	12.5	19.0	2.8
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	345	530	548	117	909	407	121	819	366	652	1328	765
V/C Ratio(X)	0.93	0.83	0.83	0.52	0.46	0.95	0.57	0.88	0.05	0.56	0.53	0.09
Avail Cap(c_a), veh/h	345	641	663	135	1169	523	148	898	402	652	1328	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	0.77	0.77	0.77	0.91	0.91	0.91
Uniform Delay (d), s/veh	52.5	38.5	38.5	53.6	36.8	15.5	56.6	53.5	27.0	42.6	28.2	15.4
Incr Delay (d2), s/veh	23.9	5.6	5.4	1.3	0.1	21.9	1.2	10.3	0.2	0.6	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	14.4	14.9	2.0	5.8	10.0	2.3	13.0	0.5	5.5	9.2	1.2
LnGrp Delay(d),s/veh	76.4	44.1	43.9	55.0	36.9	37.4	57.8	63.9	27.2	43.2	29.6	15.6
LnGrp LOS	E	D	D	D	D	D	E	E	C	D	C	B
Approach Vol, veh/h		1215			862			808			1134	
Approach Delay, s/veh		52.5			38.4			62.5			33.2	
Approach LOS		D			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.9	34.7	12.7	41.7	13.0	52.6	18.0	36.4
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	* 32	10.0	45.0	11.0	35.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	14.5	27.0	6.4	30.7	7.1	21.0	14.9	19.8
Green Ext Time (p_c), s	0.1	1.8	0.0	6.5	0.0	4.3	0.0	7.8

Intersection Summary	
HCM 2010 Ctrl Delay	46.0
HCM 2010 LOS	D

Notes

APPENDIX 6.1:

OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1219	317	6	963	511	85	399
Future Volume (vph)	1219	317	6	963	511	85	399
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.43	0.37	0.04	0.57	0.60	0.56	0.70
Control Delay	11.6	3.2	27.5	9.5	22.6	21.2	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	3.2	27.5	9.5	22.6	21.2	20.0
LOS	B	A	C	A	C	C	B
Approach Delay	9.9			9.6		21.1	
Approach LOS	A			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 67.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1219	317	6	963	0	0	0	0	511	85	399
Future Volume (veh/h)	0	1219	317	6	963	0	0	0	0	511	85	399
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1257	257	6	993	0				590	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1257	257	6	993	0				590	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	8.9	7.1	0.2	9.2	0.0				8.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.9	7.1	0.2	9.2	0.0				8.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.49	0.40	0.47	0.57	0.00				0.55	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.76	0.76	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.8	12.3	29.6	6.3	0.0				16.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.4	7.3	1.0	0.0				2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	3.0	0.1	4.5	0.0				4.2	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.9	12.7	36.9	7.3	0.0				18.3	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1514			999						590	
Approach Delay, s/veh		12.9			7.5						18.3	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	10.9		10.9		11.2		
Green Ext Time (p_c), s	0.0	8.2		1.2		14.9		

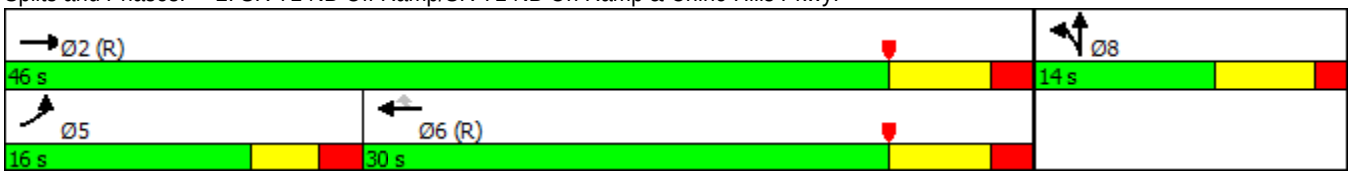
Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	559	1171	594	338	376	200
Future Volume (vph)	559	1171	594	338	376	200
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	46.0	30.0	30.0	14.0	14.0
Total Split (%)	26.7%	76.7%	50.0%	50.0%	23.3%	23.3%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	39.5	23.5	23.5	8.0	8.0
Actuated g/C Ratio	0.18	0.66	0.39	0.39	0.13	0.13
v/c Ratio	1.09	0.55	0.47	0.53	1.03	0.97
Control Delay	93.4	6.4	15.0	11.3	104.5	65.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	6.4	15.0	11.3	104.5	65.7
LOS	F	A	B	B	F	E
Approach Delay		34.5	13.7			78.4
Approach LOS		C	B			E

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 36.4	Intersection LOS: D
Intersection Capacity Utilization 67.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	559	1171	0	0	594	338	376	200	9	0	0	0
Future Volume (veh/h)	559	1171	0	0	594	338	376	200	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	588	1233	0	0	625	355	412	189	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	542	2252	0	0	1340	590	432	231	7			
Arrive On Green	0.18	0.66	0.00	0.00	0.39	0.39	0.13	0.13	0.13			
Sat Flow, veh/h	2956	3510	0	0	3510	1505	3238	1735	55			
Grp Volume(v), veh/h	588	1233	0	0	625	355	412	0	195			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1505	1619	0	1790			
Q Serve(g_s), s	11.0	11.6	0.0	0.0	8.2	11.3	7.6	0.0	6.4			
Cycle Q Clear(g_c), s	11.0	11.6	0.0	0.0	8.2	11.3	7.6	0.0	6.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	542	2252	0	0	1340	590	432	0	239			
V/C Ratio(X)	1.08	0.55	0.00	0.00	0.47	0.60	0.95	0.00	0.82			
Avail Cap(c_a), veh/h	542	2252	0	0	1340	590	432	0	239			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.89	0.89	0.00	0.00	0.66	0.66	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.5	5.5	0.0	0.0	13.6	14.5	25.8	0.0	25.3			
Incr Delay (d2), s/veh	61.6	0.9	0.0	0.0	0.8	3.0	33.3	0.0	25.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	9.1	5.6	0.0	0.0	4.0	5.1	5.4	0.0	4.8			
LnGrp Delay(d),s/veh	86.1	6.3	0.0	0.0	14.4	17.5	59.1	0.0	50.9			
LnGrp LOS	F	A			B	B	E		D			
Approach Vol, veh/h		1821			980			607				
Approach Delay, s/veh		32.1			15.5			56.5				
Approach LOS		C			B			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		46.0			16.0	30.0		14.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		39.5			11.0	23.5		8.0
Max Q Clear Time (g_c+I1), s		13.6			13.0	13.3		9.6
Green Ext Time (p_c), s		16.5			0.0	8.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

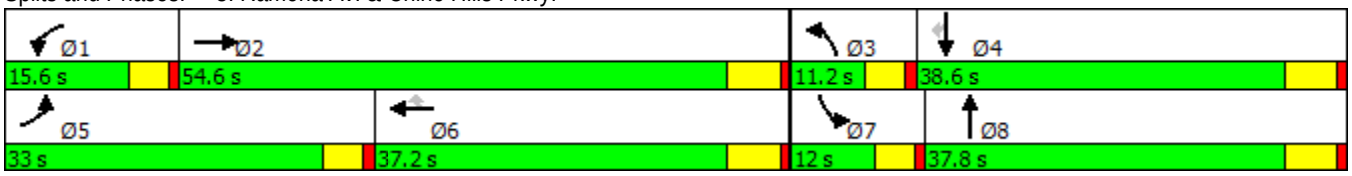
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	354	822	67	655	97	27	399	84	181	250
Future Volume (vph)	354	822	67	655	97	27	399	84	181	250
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	28.3	50.6	8.9	29.1	29.1	6.0	32.0	7.4	37.5	37.5
Actuated g/C Ratio	0.24	0.43	0.08	0.25	0.25	0.05	0.27	0.06	0.32	0.32
v/c Ratio	0.96	0.41	0.58	0.82	0.21	0.34	0.63	0.87	0.18	0.40
Control Delay	81.9	24.6	71.9	50.5	2.4	66.2	38.5	115.1	31.6	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.9	24.6	71.9	50.5	2.4	66.2	38.5	115.1	31.6	6.0
LOS	F	C	E	D	A	E	D	F	C	A
Approach Delay		41.8		46.5			39.8		32.7	
Approach LOS		D		D			D		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 117.7
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 41.2 — Intersection LOS: D
Intersection Capacity Utilization 90.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	354	822	4	67	655	97	27	399	150	84	181	250
Future Volume (veh/h)	354	822	4	67	655	97	27	399	150	84	181	250
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	373	865	3	71	689	85	28	420	90	88	191	167
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	393	2175	8	88	827	364	41	767	163	103	1066	468
Arrive On Green	0.24	0.43	0.43	0.05	0.24	0.24	0.03	0.27	0.27	0.06	0.31	0.31
Sat Flow, veh/h	1619	5055	18	1619	3420	1507	1619	2800	595	1619	3420	1504
Grp Volume(v), veh/h	373	561	307	71	689	85	28	255	255	88	191	167
Grp Sat Flow(s),veh/h/ln	1619	1638	1797	1619	1710	1507	1619	1710	1684	1619	1710	1504
Q Serve(g_s), s	26.5	13.7	13.7	5.1	22.4	5.3	2.0	14.9	15.1	6.3	4.8	10.1
Cycle Q Clear(g_c), s	26.5	13.7	13.7	5.1	22.4	5.3	2.0	14.9	15.1	6.3	4.8	10.1
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	393	1410	773	88	827	364	41	468	461	103	1066	468
V/C Ratio(X)	0.95	0.40	0.40	0.80	0.83	0.23	0.68	0.54	0.55	0.86	0.18	0.36
Avail Cap(c_a), veh/h	393	1410	773	152	919	405	91	468	461	103	1066	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	22.9	22.9	54.6	42.1	35.6	56.5	36.2	36.3	54.2	29.3	31.2
Incr Delay (d2), s/veh	31.9	0.3	0.5	6.2	6.5	0.5	7.0	4.5	4.7	45.8	0.4	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	6.3	6.9	2.4	11.3	2.3	1.0	7.6	7.6	4.1	2.3	4.4
LnGrp Delay(d),s/veh	75.5	23.1	23.4	60.9	48.6	36.1	63.5	40.7	41.0	100.0	29.7	33.3
LnGrp LOS	E	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1241			845			538			446	
Approach Delay, s/veh		38.9			48.3			42.1			44.9	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	56.1	7.6	42.2	33.0	34.1	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	7.1	15.7	4.0	12.1	28.5	24.4	8.3	17.1
Green Ext Time (p_c), s	0.0	17.7	0.0	4.5	0.0	3.9	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.9
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	839	97	28	698	109	32
Future Vol, veh/h	839	97	28	698	109	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	922	107	31	767	120	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	922	0	1367	461
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	749	-	141	553
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	749	-	135	553
Mov Cap-2 Maneuver	-	-	-	-	307	-
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	593	-

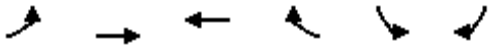
Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	24.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	341	-	-	749	-
HCM Lane V/C Ratio	0.454	-	-	0.041	-
HCM Control Delay (s)	24.1	-	-	10	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	2.3	-	-	0.1	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	221	650	628	66	98
Future Volume (vph)	221	650	628	66	98
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	92.0	50.0	28.0	42.0
Total Split (%)	35.0%	76.7%	41.7%	23.3%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	17.0	46.7	25.0	22.7	40.8
Actuated g/C Ratio	0.21	0.58	0.31	0.28	0.50
v/c Ratio	0.71	0.36	0.68	0.09	0.13
Control Delay	43.0	9.3	28.4	26.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	9.3	28.4	26.3	3.5
LOS	D	A	C	C	A
Approach Delay		17.8	28.4	12.7	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 81.2	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 54.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	221	650	628	31	66	98
Future Volume (veh/h)	221	650	628	31	66	98
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	240	707	683	34	72	32
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	278	2015	1200	60	798	675
Arrive On Green	0.17	0.59	0.36	0.36	0.27	0.27
Sat Flow, veh/h	1619	3510	3406	165	2956	1530
Grp Volume(v), veh/h	240	707	352	365	72	32
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1771	1478	1530
Q Serve(g_s), s	11.9	8.8	13.6	13.6	1.5	1.0
Cycle Q Clear(g_c), s	11.9	8.8	13.6	13.6	1.5	1.0
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	278	2015	619	641	798	675
V/C Ratio(X)	0.86	0.35	0.57	0.57	0.09	0.05
Avail Cap(c_a), veh/h	736	3583	919	951	798	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	8.8	21.1	21.1	22.5	13.1
Incr Delay (d2), s/veh	3.2	0.1	1.2	1.1	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	4.2	6.6	6.8	0.6	1.2
LnGrp Delay(d),s/veh	36.3	8.9	22.3	22.2	22.7	13.3
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		947	717		104	
Approach Delay, s/veh		15.9	22.3		19.8	
Approach LOS		B	C		B	

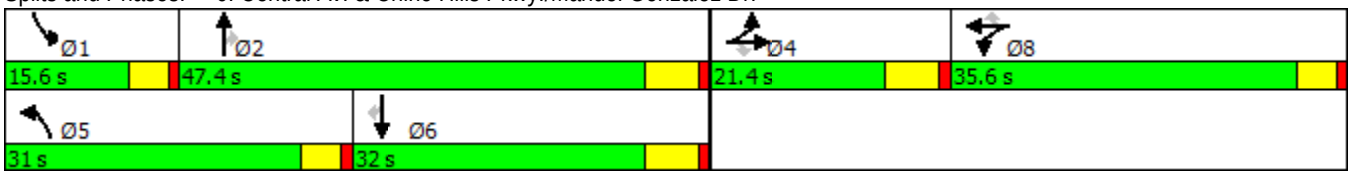
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		54.3		28.0	18.7	35.6		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		86.2		22.2	37.4	44.2		
Max Q Clear Time (g_c+I1), s		10.8		3.5	13.9	15.6		
Green Ext Time (p_c), s		19.4		0.2	0.3	14.1		

Intersection Summary	
HCM 2010 Ctrl Delay	18.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	306	52	257	2	3	7	369	827	45	65	681	254
Future Volume (vph)	306	52	257	2	3	7	369	827	45	65	681	254
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	15.9	13.5	13.5	13.5	26.9	47.7	47.7	8.1	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.51	0.51	0.09	0.28	0.28
v/c Ratio	0.75	0.71	0.57	0.01	0.01	0.02	0.87	0.52	0.06	0.51	0.77	0.49
Control Delay	59.0	55.0	10.5	35.5	35.3	0.1	55.2	21.1	0.1	57.7	39.2	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	55.0	10.5	35.5	35.3	0.1	55.2	21.1	0.1	57.7	39.2	14.3
LOS	E	D	B	D	D	A	E	C	A	E	D	B
Approach Delay		37.6			13.7			30.5			34.1	
Approach LOS		D			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 33.2	Intersection LOS: C
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	52	257	2	3	7	369	827	45	65	681	254
Future Volume (veh/h)	306	52	257	2	3	7	369	827	45	65	681	254
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	374	0	183	2	3	3	401	899	37	71	740	221
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	483	0	228	33	37	31	434	1803	790	88	1072	474
Arrive On Green	0.15	0.00	0.15	0.02	0.02	0.02	0.27	0.53	0.53	0.05	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	374	0	183	2	3	3	401	899	37	71	740	221
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	9.3	0.0	9.7	0.1	0.1	0.2	20.1	14.1	1.0	3.6	15.8	9.8
Cycle Q Clear(g_c), s	9.3	0.0	9.7	0.1	0.1	0.2	20.1	14.1	1.0	3.6	15.8	9.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	483	0	228	33	37	31	434	1803	790	88	1072	474
V/C Ratio(X)	0.77	0.00	0.80	0.06	0.08	0.10	0.92	0.50	0.05	0.80	0.69	0.47
Avail Cap(c_a), veh/h	604	0	286	601	668	568	511	1803	790	213	1072	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	0.0	34.4	40.2	40.2	40.2	29.7	12.7	9.6	39.1	25.1	23.1
Incr Delay (d2), s/veh	4.9	0.0	12.3	0.8	1.0	1.3	19.3	1.0	0.1	6.2	3.6	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	4.8	0.1	0.1	0.1	11.4	6.9	0.4	1.8	7.9	4.5
LnGrp Delay(d),s/veh	39.1	0.0	46.6	40.9	41.1	41.5	49.1	13.7	9.7	45.3	28.8	26.3
LnGrp LOS	D		D	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		557			8			1337			1032	
Approach Delay, s/veh		41.6			41.2			24.2			29.4	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.2	49.8		18.3	27.0	32.0		6.3
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.6	16.1		11.7	22.1	17.8		2.2
Green Ext Time (p_c), s	0.0	17.5		0.8	0.3	7.0		0.0

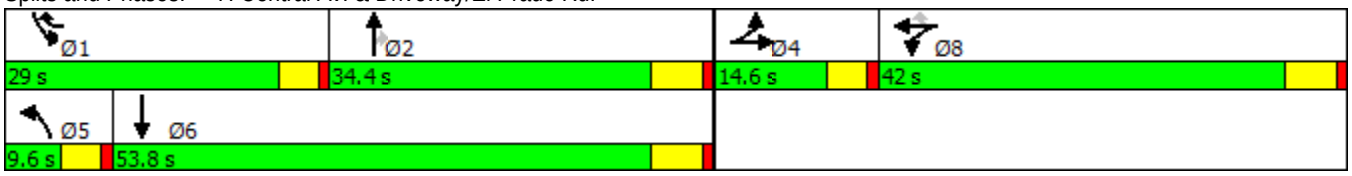
Intersection Summary	
HCM 2010 Ctrl Delay	29.4
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1029	3	501	2	767	688	393	627
Future Volume (vph)	1	1	1029	3	501	2	767	688	393	627
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	1.11	1.06	0.53	0.03	0.94	0.81	1.20	0.28
Control Delay	48.0	41.0	109.3	89.7	7.9	53.0	58.4	11.4	151.4	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	109.3	89.7	7.9	53.0	58.4	11.4	151.4	16.3
LOS	D	D	F	F	A	D	E	B	F	B
Approach Delay		43.3		69.5			36.2			67.9
Approach LOS		D		E			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 57.0	Intersection LOS: E
Intersection Capacity Utilization 98.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1029	3	501	2	767	688	393	627	9
Future Volume (veh/h)	1	1	1	1029	3	501	2	767	688	393	627	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1145	0	414	2	852	595	437	697	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1057	0	836	4	882	390	356	2380	27
Arrive On Green	0.01	0.01	0.01	0.33	0.00	0.33	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5008	57
Grp Volume(v), veh/h	1	0	2	1145	0	414	2	852	595	437	456	249
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1790
Q Serve(g_s), s	0.1	0.0	0.1	36.2	0.0	18.7	0.1	27.3	28.6	24.4	9.4	9.4
Cycle Q Clear(g_c), s	0.1	0.0	0.1	36.2	0.0	18.7	0.1	27.3	28.6	24.4	9.4	9.4
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1057	0	836	4	882	390	356	1557	851
V/C Ratio(X)	0.08	0.00	0.15	1.08	0.00	0.50	0.46	0.97	1.53	1.23	0.29	0.29
Avail Cap(c_a), veh/h	146	0	149	1057	0	836	73	882	390	356	1557	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	37.3	0.0	15.6	55.2	40.7	41.1	43.2	17.7	17.7
Incr Delay (d2), s/veh	0.9	0.0	2.0	53.0	0.0	0.5	25.4	23.1	250.0	124.4	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	23.8	0.0	8.0	0.1	15.7	38.8	23.1	4.3	4.8
LnGrp Delay(d),s/veh	55.5	0.0	56.6	90.4	0.0	16.1	80.6	63.7	291.2	167.6	18.2	18.6
LnGrp LOS	E		E	F		B	F	E	F	F	B	B
Approach Vol, veh/h		3			1559			1449			1142	
Approach Delay, s/veh		56.2			70.7			157.1			75.5	
Approach LOS		E			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		42.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	11.4		38.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	24.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	102.1
HCM 2010 LOS	F

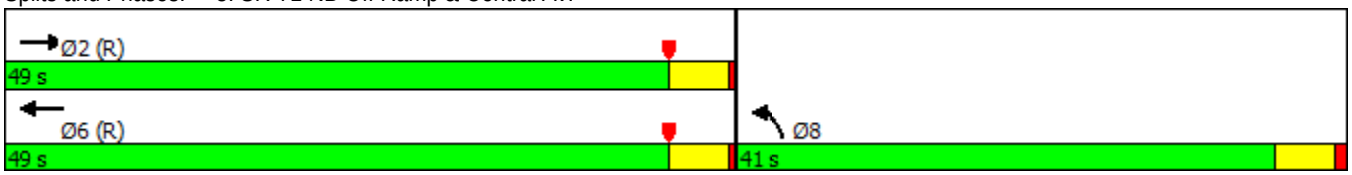
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1176	877	101
Future Volume (vph)	1176	877	101
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	49.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	58.1	58.1	22.4
Actuated g/C Ratio	0.65	0.65	0.25
v/c Ratio	0.87dr	0.33	1.19dr
Control Delay	8.4	8.1	38.2
Queue Delay	0.0	0.0	0.0
Total Delay	8.4	8.1	38.2
LOS	A	A	D
Approach Delay	8.4	8.1	38.2
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 67.3%	ICU Level of Service C
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1176	794	0	877	101	378
Future Volume (veh/h)	1176	794	0	877	101	378
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1417	957	0	1057	122	262
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2292	1071	0	3438	315	298
Arrive On Green	1.00	1.00	0.00	0.70	0.19	0.19
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1417	957	0	1057	122	262
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	7.4	5.9	15.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.4	5.9	15.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2292	1071	0	3438	315	298
V/C Ratio(X)	0.62	0.89	0.00	0.31	0.39	0.88
Avail Cap(c_a), veh/h	2292	1071	0	3438	648	612
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.2	31.6	35.2
Incr Delay (d2), s/veh	1.3	11.4	0.0	0.2	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.4	0.0	3.4	2.7	6.6
LnGrp Delay(d),s/veh	1.3	11.4	0.0	5.4	31.8	38.5
LnGrp LOS	A	B		A	C	D
Approach Vol, veh/h	2374			1057	384	
Approach Delay, s/veh	5.4			5.4	36.4	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		67.5				67.5		22.5
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		36.0
Max Q Clear Time (g_c+I1), s		2.0				9.4		17.0
Green Ext Time (p_c), s		28.7				25.1		0.6

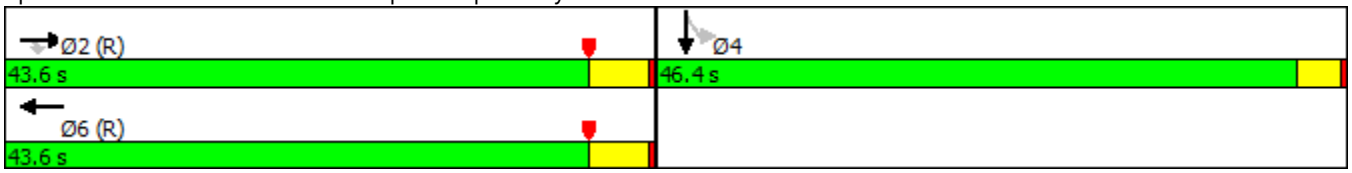
Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1384	72	777	586	0
Future Volume (vph)	1384	72	777	586	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	41.9	41.9	41.9	40.1	40.1
Actuated g/C Ratio	0.47	0.47	0.47	0.45	0.45
v/c Ratio	0.77	0.12	0.55	0.91	0.82
Control Delay	23.5	3.9	12.8	42.4	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	3.9	12.8	42.4	30.7
LOS	C	A	B	D	C
Approach Delay	22.5		12.8		36.8
Approach LOS	C		B		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 23.7	Intersection LOS: C
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1384	72	0	777	200	0	0	0	586	0	357
Future Volume (veh/h)	0	1384	72	0	777	200	0	0	0	586	0	357
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1752	0	0	984	253				527	301	311
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2503	779	0	1986	510				651	326	337
Arrive On Green	0.00	0.51	0.00	0.00	1.00	1.00				0.40	0.40	0.40
Sat Flow, veh/h	0	5076	1530	0	4061	1001				1619	812	839
Grp Volume(v), veh/h	0	1752	0	0	826	411				527	0	612
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1623				1619	0	1652
Q Serve(g_s), s	0.0	24.5	0.0	0.0	0.0	0.0				26.0	0.0	31.7
Cycle Q Clear(g_c), s	0.0	24.5	0.0	0.0	0.0	0.0				26.0	0.0	31.7
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.51
Lane Grp Cap(c), veh/h	0	2503	779	0	1668	827				651	0	664
V/C Ratio(X)	0.00	0.70	0.00	0.00	0.50	0.50				0.81	0.00	0.92
Avail Cap(c_a), veh/h	0	2503	779	0	1668	827				772	0	787
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.8	0.0	0.0	0.0	0.0				23.9	0.0	25.6
Incr Delay (d2), s/veh	0.0	1.7	0.0	0.0	1.1	2.1				4.7	0.0	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.4	0.0	0.0	0.2	0.5				12.4	0.0	17.0
LnGrp Delay(d),s/veh	0.0	18.5	0.0	0.0	1.1	2.1				28.5	0.0	39.2
LnGrp LOS		B			A	A				C		D
Approach Vol, veh/h		1752			1237						1139	
Approach Delay, s/veh		18.5			1.4						34.3	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		50.3		39.7		50.3		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		26.5		33.7		2.0		
Green Ext Time (p_c), s		10.8		2.5		25.4		

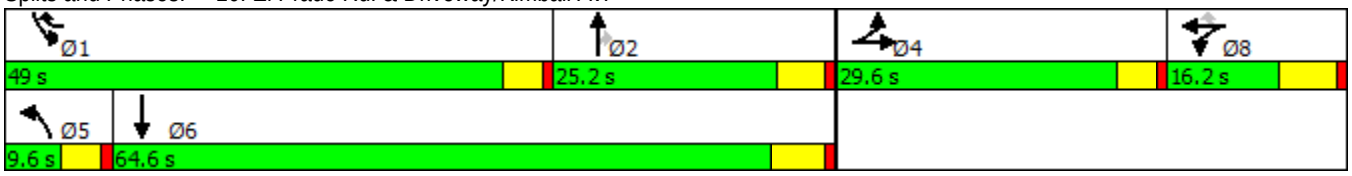
Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	1	26	1253	5	282	32	733	205
Future Volume (vph)	11	1	26	1253	5	282	32	733	205
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	58.1	5.2	19.7	19.7	45.8	59.7
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.21	0.21	0.48	0.63
v/c Ratio	0.05	0.01	0.29	1.09	0.06	0.77	0.08	0.96	0.12
Control Delay	40.1	30.3	49.7	66.1	52.6	54.2	0.3	53.4	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.3	49.7	66.1	52.6	54.2	0.3	53.4	9.3
LOS	D	C	D	E	D	D	A	D	A
Approach Delay		38.0	65.4			48.8			42.3
Approach LOS		D	E			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 54.6	Intersection LOS: D
Intersection Capacity Utilization 117.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	2	28	26	1253	5	282	32	733	205	43
Future Volume (veh/h)	11	1	2	28	26	1253	5	282	32	733	205	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	1	1	29	27	418	5	288	33	748	209	44
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	49	25	25	94	88	863	84	334	284	746	1677	346
Arrive On Green	0.03	0.03	0.03	0.10	0.10	0.10	0.05	0.19	0.19	0.46	0.59	0.59
Sat Flow, veh/h	1619	827	827	909	846	1530	1619	1800	1530	1619	2823	583
Grp Volume(v), veh/h	11	0	2	56	0	418	5	288	33	748	125	128
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1697
Q Serve(g_s), s	0.6	0.0	0.1	2.8	0.0	10.0	0.3	15.0	1.7	44.4	3.1	3.2
Cycle Q Clear(g_c), s	0.6	0.0	0.1	2.8	0.0	10.0	0.3	15.0	1.7	44.4	3.1	3.2
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	49	0	50	182	0	863	84	334	284	746	1016	1008
V/C Ratio(X)	0.22	0.00	0.04	0.31	0.00	0.48	0.06	0.86	0.12	1.00	0.12	0.13
Avail Cap(c_a), veh/h	420	0	429	182	0	863	84	373	317	746	1043	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	0.0	45.4	40.0	0.0	12.6	43.5	38.1	32.7	26.0	8.6	8.6
Incr Delay (d2), s/veh	2.2	0.0	0.3	0.9	0.0	0.4	0.1	17.0	0.2	33.8	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	1.4	0.0	6.7	0.1	9.0	0.7	26.7	1.5	1.5
LnGrp Delay(d),s/veh	47.9	0.0	45.7	41.0	0.0	13.0	43.6	55.1	32.9	59.8	8.6	8.6
LnGrp LOS	D		D	D		B	D	E	C	F	A	A
Approach Vol, veh/h		13			474			326			1001	
Approach Delay, s/veh		47.5			16.3			52.7			46.9	
Approach LOS		D			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	49.0	23.7		7.5	9.6	63.1		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	46.4	17.0		2.6	2.3	5.2		12.0
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	3.3		0.0

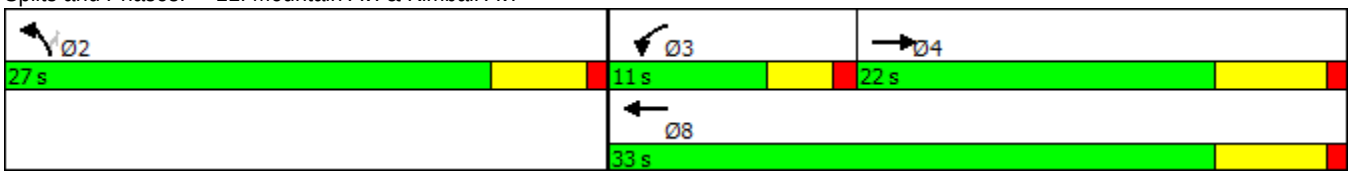
Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	655	132	1080	272	50
Future Volume (vph)	655	132	1080	272	50
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	14.7	7.5	22.8	12.7	12.7
Actuated g/C Ratio	0.31	0.16	0.48	0.27	0.27
v/c Ratio	0.77	0.55	0.69	0.66	0.12
Control Delay	22.6	34.3	12.4	24.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	34.3	12.4	24.4	5.6
LOS	C	C	B	C	A
Approach Delay	22.6		14.8	21.5	
Approach LOS	C		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 47.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 18.4	Intersection LOS: B
Intersection Capacity Utilization 61.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	655	127	132	1080	272	50
Future Volume (veh/h)	655	127	132	1080	272	50
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	682	127	138	1125	283	47
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	908	169	207	1821	350	330
Arrive On Green	0.32	0.32	0.13	0.53	0.22	0.22
Sat Flow, veh/h	2970	536	1619	3510	1619	1530
Grp Volume(v), veh/h	405	404	138	1125	283	47
Grp Sat Flow(s),veh/h/ln	1710	1705	1619	1710	1619	1530
Q Serve(g_s), s	9.5	9.6	3.6	10.3	7.5	1.1
Cycle Q Clear(g_c), s	9.5	9.6	3.6	10.3	7.5	1.1
Prop In Lane		0.31	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	539	538	207	1821	350	330
V/C Ratio(X)	0.75	0.75	0.67	0.62	0.81	0.14
Avail Cap(c_a), veh/h	610	608	252	2057	783	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.8	13.8	18.7	7.3	16.7	14.2
Incr Delay (d2), s/veh	3.7	3.8	2.8	0.3	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	5.1	1.8	4.8	3.5	0.5
LnGrp Delay(d),s/veh	17.5	17.6	21.5	7.6	18.4	14.3
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	809			1263	330	
Approach Delay, s/veh	17.5			9.1	17.8	
Approach LOS	B			A	B	

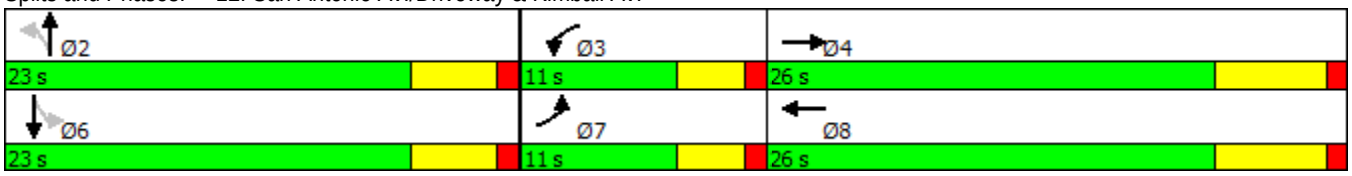
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		15.0	9.7	20.1				29.9
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		9.5	5.6	11.6				12.3
Green Ext Time (p_c), s		0.2	0.0	2.6				5.4

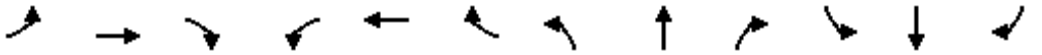
Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	587	36	1215	63	0	46	0
Future Volume (vph)	38	587	36	1215	63	0	46	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	26.0	11.0	26.0	23.0	23.0	23.0	23.0
Total Split (%)	18.3%	43.3%	18.3%	43.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	20.7	7.2	20.7	9.0	9.0	9.0	9.0
Actuated g/C Ratio	0.16	0.46	0.16	0.46	0.20	0.20	0.20	0.20
v/c Ratio	0.15	0.44	0.15	0.83	0.26	0.03	0.19	0.01
Control Delay	21.7	11.0	21.6	20.9	18.9	0.1	17.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	11.0	21.6	20.9	18.9	0.1	17.9	0.0
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.6		20.9		15.2		16.2
Approach LOS		B		C		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 17.5	Intersection LOS: B
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	587	64	36	1215	18	63	0	15	46	0	5
Future Volume (veh/h)	38	587	64	36	1215	18	63	0	15	46	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	40	624	68	38	1293	19	67	0	13	49	0	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1349	147	96	1491	22	382	0	248	374	0	248
Arrive On Green	0.06	0.43	0.43	0.06	0.43	0.43	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	1619	3104	338	1619	3450	51	1354	0	1530	1344	0	1530
Grp Volume(v), veh/h	40	343	349	38	641	671	67	0	13	49	0	5
Grp Sat Flow(s),veh/h/ln	1619	1710	1732	1619	1710	1791	1354	0	1530	1344	0	1530
Q Serve(g_s), s	1.0	6.1	6.2	1.0	14.7	14.7	1.9	0.0	0.3	1.4	0.0	0.1
Cycle Q Clear(g_c), s	1.0	6.1	6.2	1.0	14.7	14.7	2.0	0.0	0.3	1.7	0.0	0.1
Prop In Lane	1.00		0.19	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	743	753	96	739	774	382	0	248	374	0	248
V/C Ratio(X)	0.40	0.46	0.46	0.40	0.87	0.87	0.18	0.00	0.05	0.13	0.00	0.02
Avail Cap(c_a), veh/h	262	790	801	262	790	828	729	0	640	719	0	640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.5	8.7	8.7	19.6	11.2	11.2	16.1	0.0	15.3	16.0	0.0	15.3
Incr Delay (d2), s/veh	1.0	0.2	0.2	1.0	9.0	8.7	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.9	2.9	0.5	8.6	9.0	0.7	0.0	0.1	0.5	0.0	0.1
LnGrp Delay(d),s/veh	20.5	8.8	8.8	20.6	20.1	19.8	16.2	0.0	15.4	16.1	0.0	15.3
LnGrp LOS	C	A	A	C	C	B	B		B	B		B
Approach Vol, veh/h		732			1350			80			54	
Approach Delay, s/veh		9.5			20.0			16.0			16.0	
Approach LOS		A			B			B			B	

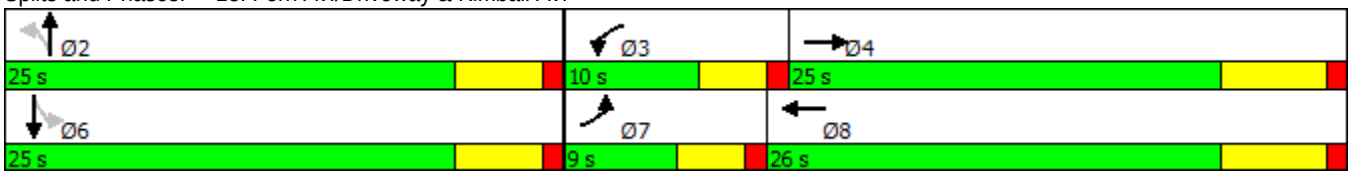
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.6	24.8		11.9	6.7	24.7
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		4.0	3.0	8.2		3.7	3.0	16.7
Green Ext Time (p_c), s		0.1	0.0	4.6		0.1	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	535	38	1264	45	0	65	1
Future Volume (vph)	36	535	38	1264	45	0	65	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	20.9	5.5	21.2	8.1	8.1	8.1	8.1
Actuated g/C Ratio	0.12	0.48	0.13	0.49	0.19	0.19	0.19	0.19
v/c Ratio	0.21	0.41	0.20	0.85	0.21	0.05	0.31	0.03
Control Delay	24.3	10.4	23.4	21.5	17.3	0.2	19.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	10.4	23.4	21.5	17.3	0.2	19.0	9.6
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.2		21.6		11.2		17.8
Approach LOS		B		C		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	535	66	38	1264	20	45	0	25	65	1	8
Future Volume (veh/h)	36	535	66	38	1264	20	45	0	25	65	1	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	40	594	66	42	1404	22	50	0	18	72	1	8
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	72	1448	161	75	1617	25	339	0	190	330	21	171
Arrive On Green	0.04	0.47	0.47	0.05	0.47	0.47	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1619	3097	343	1619	3446	54	1349	0	1530	1338	173	1383
Grp Volume(v), veh/h	40	327	333	42	696	730	50	0	18	72	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1731	1619	1710	1790	1349	0	1530	1338	0	1556
Q Serve(g_s), s	1.0	5.1	5.1	1.0	14.7	14.7	1.4	0.0	0.4	2.0	0.0	0.2
Cycle Q Clear(g_c), s	1.0	5.1	5.1	1.0	14.7	14.7	1.6	0.0	0.4	2.5	0.0	0.2
Prop In Lane	1.00		0.20	1.00		0.03	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	72	799	809	75	802	840	339	0	190	330	0	193
V/C Ratio(X)	0.55	0.41	0.41	0.56	0.87	0.87	0.15	0.00	0.09	0.22	0.00	0.05
Avail Cap(c_a), veh/h	201	818	828	241	861	901	844	0	763	831	0	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.9	7.1	7.1	18.8	9.6	9.6	16.3	0.0	15.7	16.7	0.0	15.6
Incr Delay (d2), s/veh	2.4	0.1	0.1	2.4	8.4	8.1	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.4	2.4	0.5	8.6	9.0	0.5	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	21.3	7.2	7.2	21.2	17.9	17.7	16.3	0.0	15.7	16.9	0.0	15.6
LnGrp LOS	C	A	A	C	B	B	B		B	B		B
Approach Vol, veh/h		700			1468			68			81	
Approach Delay, s/veh		8.0			17.9			16.2			16.7	
Approach LOS		A			B			B			B	

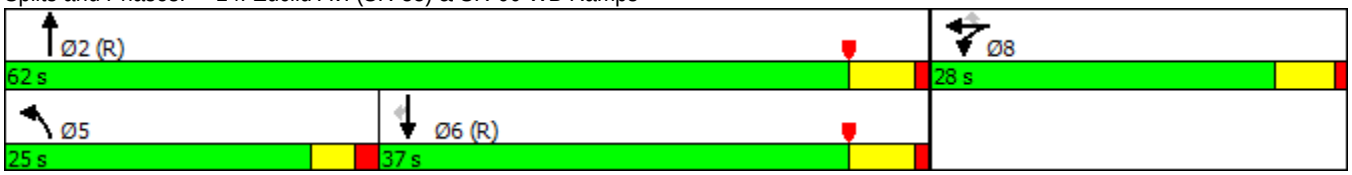
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	5.9	24.6		9.9	5.8	24.6
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.6	3.0	7.1		4.5	3.0	16.7
Green Ext Time (p_c), s		0.1	0.0	5.0		0.1	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	14.8
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	732	2	378	453	963	1034	480
Future Volume (vph)	732	2	378	453	963	1034	480
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.0	23.0	23.0	20.5	56.5	31.5	31.5
Actuated g/C Ratio	0.26	0.26	0.26	0.23	0.63	0.35	0.35
v/c Ratio	1.06	1.04	0.80	1.33	0.48	0.93	0.61
Control Delay	97.9	89.0	35.5	179.9	21.8	42.9	5.6
Queue Delay	0.0	0.0	0.0	0.0	2.4	0.7	0.0
Total Delay	97.9	89.0	35.5	179.9	24.2	43.6	5.6
LOS	F	F	D	F	C	D	A
Approach Delay		75.8			74.0	31.5	
Approach LOS		E			E	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 58.6	Intersection LOS: E
Intersection Capacity Utilization 102.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	732	2	378	453	963	0	0	1034	480
Future Volume (veh/h)	0	0	0	732	2	378	453	963	0	0	1034	480
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				866	0	168	487	1035	0	0	1112	516
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				828	0	391	369	2147	0	0	1197	515
Arrive On Green				0.26	0.00	0.26	0.46	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1473
Grp Volume(v), veh/h				866	0	168	487	1035	0	0	1112	516
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1473
Q Serve(g_s), s				23.0	0.0	8.3	20.5	0.0	0.0	0.0	28.2	31.5
Cycle Q Clear(g_c), s				23.0	0.0	8.3	20.5	0.0	0.0	0.0	28.2	31.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				828	0	391	369	2147	0	0	1197	515
V/C Ratio(X)				1.05	0.00	0.43	1.32	0.48	0.00	0.00	0.93	1.00
Avail Cap(c_a), veh/h				828	0	391	369	2147	0	0	1197	515
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.28	0.28	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.5	0.0	28.0	24.5	0.0	0.0	0.0	28.2	29.3
Incr Delay (d2), s/veh				44.1	0.0	0.3	149.7	0.2	0.0	0.0	13.8	39.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.3	0.0	3.5	24.3	0.1	0.0	0.0	15.6	18.5
LnGrp Delay(d),s/veh				77.6	0.0	28.3	174.2	0.2	0.0	0.0	41.9	69.2
LnGrp LOS				F		C	F	A			D	F
Approach Vol, veh/h					1034			1522			1628	
Approach Delay, s/veh					69.6			55.9			50.6	
Approach LOS					E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			25.0	37.0		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			22.5	33.5		25.0
Green Ext Time (p_c), s		42.4			0.0	0.0		0.0

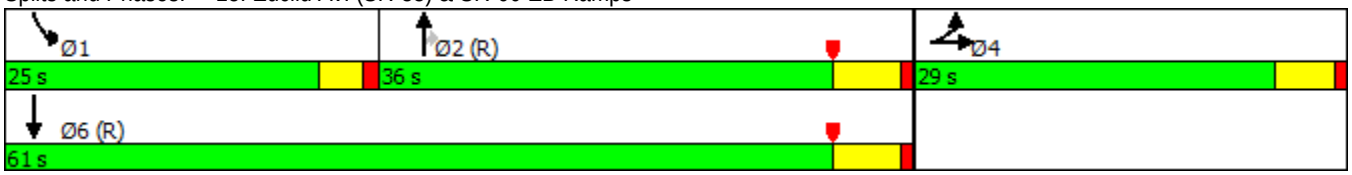
Intersection Summary	
HCM 2010 Ctrl Delay	57.2
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	337	0	1079	638	299	1467
Future Volume (vph)	337	0	1079	638	299	1467
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	31.7	31.7	19.8	55.5
Actuated g/C Ratio	0.27	0.27	0.35	0.35	0.22	0.62
v/c Ratio	0.79	1.53	0.95	0.71	0.90	0.74
Control Delay	46.5	273.4	46.7	7.0	49.1	5.9
Queue Delay	4.1	0.8	0.0	0.0	0.0	2.7
Total Delay	50.6	274.2	46.7	7.0	49.1	8.5
LOS	D	F	D	A	D	A
Approach Delay		202.5	31.9			15.4
Approach LOS		F	C			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.53	
Intersection Signal Delay: 61.8	Intersection LOS: E
Intersection Capacity Utilization 102.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	337	0	609	0	0	0	0	1079	638	299	1467	0
Future Volume (veh/h)	337	0	609	0	0	0	0	1079	638	299	1467	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	359	0	565				0	1148	679	318	1561	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	432	0	408				0	1226	546	346	2109	0
Arrive On Green	0.27	0.00	0.27				0.00	0.36	0.36	0.28	0.82	0.00
Sat Flow, veh/h	1619	0	1530				0	3510	1521	1619	3510	0
Grp Volume(v), veh/h	359	0	565				0	1148	679	318	1561	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1521	1619	1710	0
Q Serve(g_s), s	18.8	0.0	24.0				0.0	29.2	32.3	17.1	18.8	0.0
Cycle Q Clear(g_c), s	18.8	0.0	24.0				0.0	29.2	32.3	17.1	18.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	408				0	1226	546	346	2109	0
V/C Ratio(X)	0.83	0.00	1.38				0.00	0.94	1.24	0.92	0.74	0.00
Avail Cap(c_a), veh/h	432	0	408				0	1226	546	378	2109	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.73	0.73	0.17	0.17	0.00
Uniform Delay (d), s/veh	31.1	0.0	33.0				0.0	27.9	28.9	31.5	4.8	0.0
Incr Delay (d2), s/veh	12.2	0.0	187.8				0.0	11.3	121.2	6.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	0.0	31.4				0.0	15.6	31.9	8.2	8.4	0.0
LnGrp Delay(d),s/veh	43.3	0.0	220.8				0.0	39.2	150.1	37.6	5.2	0.0
LnGrp LOS	D		F					D	F	D	A	
Approach Vol, veh/h		924						1827			1879	
Approach Delay, s/veh		151.8						80.4			10.7	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.2	37.8		29.0		61.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	19.1	34.3		26.0		20.8		
Green Ext Time (p_c), s	0.1	0.0		0.0		32.9		

Intersection Summary	
HCM 2010 Ctrl Delay	66.4
HCM 2010 LOS	E

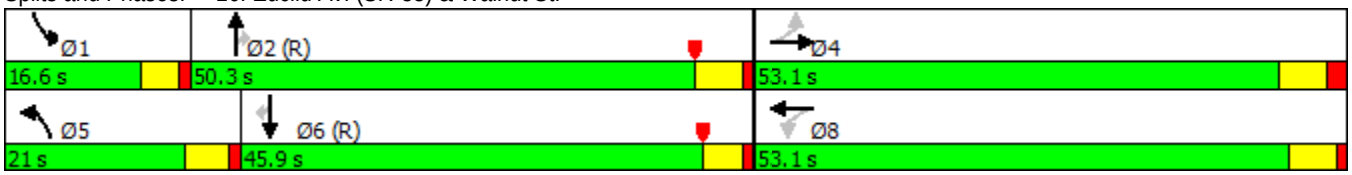
Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	152	339	88	313	115	1368	53	160	1635	58
Future Volume (vph)	152	339	88	313	115	1368	53	160	1635	58
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.7	33.7	34.7	34.7	13.5	59.6	59.6	10.6	57.2	57.2
Actuated g/C Ratio	0.28	0.28	0.29	0.29	0.11	0.50	0.50	0.09	0.48	0.48
v/c Ratio	1.03	0.49	0.50	0.51	0.67	0.59	0.07	0.64	0.74	0.08
Control Delay	119.2	33.1	42.2	28.2	57.5	22.9	5.7	64.2	30.3	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.2	33.1	42.2	28.2	57.5	22.9	5.7	64.2	30.3	5.0
LOS	F	C	D	C	E	C	A	E	C	A
Approach Delay		55.0		30.3		24.9			32.4	
Approach LOS		E		C		C			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 32.6 — Intersection LOS: C
Intersection Capacity Utilization 83.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	339	107	88	313	175	115	1368	53	160	1635	58
Future Volume (veh/h)	152	339	107	88	313	175	115	1368	53	160	1635	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	160	357	91	93	329	151	121	1440	37	168	1721	32
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	261	927	233	278	782	351	146	2214	689	216	2112	657
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.03	0.15	0.15	0.07	0.43	0.43
Sat Flow, veh/h	877	2707	682	904	2283	1025	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	160	224	224	93	245	235	121	1440	37	168	1721	32
Grp Sat Flow(s),veh/h/ln	877	1710	1679	904	1710	1598	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	20.7	11.9	12.2	10.4	13.2	13.6	8.9	33.1	2.5	6.7	36.9	1.5
Cycle Q Clear(g_c), s	34.3	11.9	12.2	22.6	13.2	13.6	8.9	33.1	2.5	6.7	36.9	1.5
Prop In Lane	1.00		0.41	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	585	575	278	585	547	146	2214	689	216	2112	657
V/C Ratio(X)	0.61	0.38	0.39	0.33	0.42	0.43	0.83	0.65	0.05	0.78	0.81	0.05
Avail Cap(c_a), veh/h	302	667	655	328	681	637	217	2214	689	298	2112	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.46	0.46	0.46	0.59	0.59	0.59
Uniform Delay (d), s/veh	43.7	29.9	29.9	38.5	30.3	30.4	57.3	42.2	29.1	54.7	30.0	19.9
Incr Delay (d2), s/veh	2.8	0.4	0.4	0.7	0.5	0.5	7.5	0.7	0.1	3.3	2.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.7	5.7	2.7	6.3	6.1	4.3	15.2	1.1	2.8	17.0	0.6
LnGrp Delay(d),s/veh	46.5	30.3	30.4	39.2	30.8	31.0	64.8	42.9	29.2	58.0	32.2	20.0
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	C	C
Approach Vol, veh/h		608			573			1598			1921	
Approach Delay, s/veh		34.6			32.2			44.2			34.2	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.3	59.4		47.4	15.7	56.9		47.4
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	8.7	35.1		36.3	10.9	38.9		24.6
Green Ext Time (p_c), s	0.1	8.9		4.8	0.1	2.4		7.0

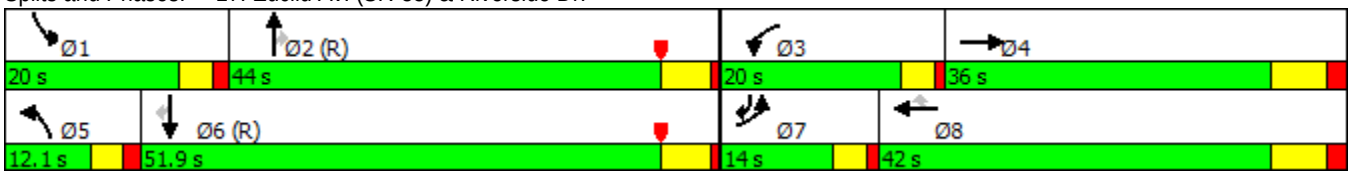
Intersection Summary	
HCM 2010 Ctrl Delay	37.4
HCM 2010 LOS	D

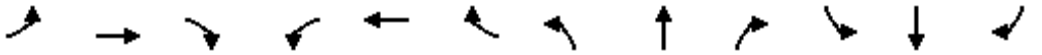
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	330	175	388	51	63	964	171	182	1044	150
Future Volume (vph)	145	330	175	388	51	63	964	171	182	1044	150
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	36.0	20.0	42.0	42.0	12.1	44.0	44.0	20.0	51.9	14.0
Total Split (%)	11.7%	30.0%	16.7%	35.0%	35.0%	10.1%	36.7%	36.7%	16.7%	43.3%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.7	22.0	15.4	25.6	25.6	9.6	42.4	42.4	19.2	54.3	71.5
Actuated g/C Ratio	0.10	0.18	0.13	0.21	0.21	0.08	0.35	0.35	0.16	0.45	0.60
v/c Ratio	0.97	0.65	0.89	0.56	0.12	0.51	0.84	0.27	0.74	0.71	0.16
Control Delay	119.9	48.8	91.4	44.4	0.6	86.7	28.6	2.9	81.4	11.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.9	48.8	91.4	44.4	0.6	86.7	28.6	2.9	81.4	11.0	0.3
LOS	F	D	F	D	A	F	C	A	F	B	A
Approach Delay		68.4		54.1			28.0			19.2	
Approach LOS		E		D			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 79.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	330	53	175	388	51	63	964	171	182	1044	150
Future Volume (veh/h)	145	330	53	175	388	51	63	964	171	182	1044	150
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	153	347	33	184	408	49	66	1015	99	192	1099	92
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	530	50	208	728	325	82	1366	611	209	1635	859
Arrive On Green	0.08	0.17	0.17	0.13	0.21	0.21	0.07	0.53	0.53	0.26	0.96	0.96
Sat Flow, veh/h	1619	3154	298	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	153	187	193	184	408	49	66	1015	99	192	1099	92
Grp Sat Flow(s),veh/h/ln	1619	1710	1742	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	10.0	12.3	12.4	13.4	12.8	3.1	4.8	27.6	4.0	13.8	4.7	0.3
Cycle Q Clear(g_c), s	10.0	12.3	12.4	13.4	12.8	3.1	4.8	27.6	4.0	13.8	4.7	0.3
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	287	293	208	728	325	82	1366	611	209	1635	859
V/C Ratio(X)	1.13	0.65	0.66	0.89	0.56	0.15	0.81	0.74	0.16	0.92	0.67	0.11
Avail Cap(c_a), veh/h	135	413	421	216	998	446	103	1366	611	209	1635	859
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.70	0.70	0.70	0.62	0.62	0.62
Uniform Delay (d), s/veh	55.0	46.6	46.7	51.4	42.2	38.4	55.4	23.3	17.8	43.9	1.5	1.0
Incr Delay (d2), s/veh	118.0	3.5	3.6	30.7	1.0	0.3	22.3	2.6	0.4	29.1	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	6.1	6.3	7.8	6.2	1.4	2.7	13.5	1.7	7.9	1.8	0.2
LnGrp Delay(d),s/veh	173.0	50.2	50.3	82.1	43.2	38.7	77.7	25.9	18.2	72.9	2.9	1.1
LnGrp LOS	F	D	D	F	D	D	E	C	B	E	A	A
Approach Vol, veh/h		533			641			1180			1383	
Approach Delay, s/veh		85.5			54.0			28.2			12.5	
Approach LOS		F			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	53.4	19.4	27.2	10.6	62.9	14.0	32.6
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	38.5	16.0	29.0	7.6	46.4	10.0	35.0
Max Q Clear Time (g_c+I1), s	15.8	29.6	15.4	14.4	6.8	6.7	12.0	14.8
Green Ext Time (p_c), s	0.0	7.3	0.0	5.5	0.0	21.6	0.0	6.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	101	123	64	62	161	69	1333	137	29	1637	98
Future Volume (vph)	101	123	64	62	161	69	1333	137	29	1637	98
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	25.8	25.8	25.8		25.8	9.8	74.3	74.3	6.9	69.7	69.7
Actuated g/C Ratio	0.22	0.22	0.22		0.22	0.08	0.62	0.62	0.06	0.58	0.58
v/c Ratio	0.68	0.33	0.17		0.81	0.56	0.66	0.15	0.33	0.87	0.11
Control Delay	63.1	40.6	4.0		61.8	66.7	17.9	4.2	49.1	43.1	13.0
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	40.6	4.0		61.8	66.7	17.9	4.2	49.1	43.1	13.0
LOS	E	D	A		E	E	B	A	D	D	B
Approach Delay		40.4			61.8		18.9			41.5	
Approach LOS		D			E		B			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 33.8	Intersection LOS: C
Intersection Capacity Utilization 93.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	123	64	62	161	36	69	1333	137	29	1637	98
Future Volume (veh/h)	101	123	64	62	161	36	69	1333	137	29	1637	98
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	106	129	43	65	169	34	73	1403	108	31	1723	74
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	202	402	337	100	223	41	90	2094	937	43	1996	892
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.11	1.00	1.00	0.02	0.39	0.39
Sat Flow, veh/h	1131	1800	1510	282	997	186	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	106	129	43	268	0	0	73	1403	108	31	1723	74
Grp Sat Flow(s),veh/h/ln	1131	1800	1510	1464	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	1.2	7.2	2.7	14.2	0.0	0.0	5.3	0.0	0.0	2.3	55.6	3.7
Cycle Q Clear(g_c), s	22.6	7.2	2.7	21.4	0.0	0.0	5.3	0.0	0.0	2.3	55.6	3.7
Prop In Lane	1.00		1.00	0.24		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	202	402	337	364	0	0	90	2094	937	43	1996	892
V/C Ratio(X)	0.53	0.32	0.13	0.74	0.00	0.00	0.81	0.67	0.12	0.71	0.86	0.08
Avail Cap(c_a), veh/h	298	555	466	499	0	0	169	2094	937	101	1996	892
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.56	0.56	0.56	0.60	0.60	0.60
Uniform Delay (d), s/veh	45.6	39.0	37.3	44.9	0.0	0.0	52.7	0.0	0.0	58.5	32.1	16.3
Incr Delay (d2), s/veh	2.1	0.5	0.2	3.7	0.0	0.0	3.7	1.0	0.1	4.8	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	3.6	1.2	8.9	0.0	0.0	2.4	0.3	0.0	1.1	27.2	1.6
LnGrp Delay(d),s/veh	47.7	39.4	37.4	48.6	0.0	0.0	56.4	1.0	0.1	63.2	35.4	16.4
LnGrp LOS	D	D	D	D			E	A	A	E	D	B
Approach Vol, veh/h		278			268			1584			1828	
Approach Delay, s/veh		42.3			48.6			3.5			35.1	
Approach LOS		D			D			A			D	

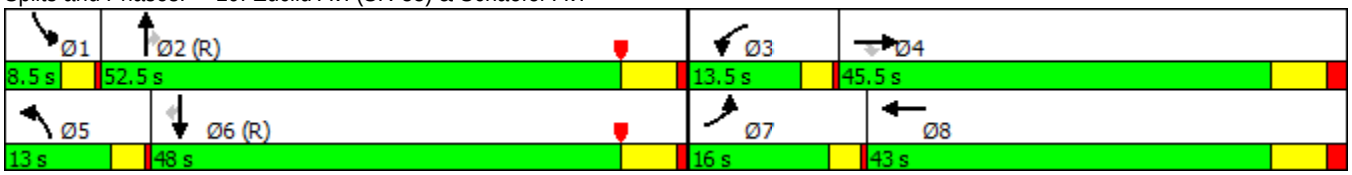
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	79.5		33.8	10.2	76.0		33.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.3	2.0		24.6	7.3	57.6		23.4
Green Ext Time (p_c), s	0.0	43.6		2.2	0.0	0.0		2.3

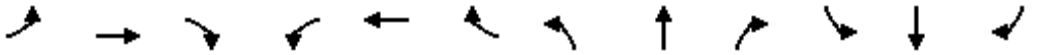
Intersection Summary	
HCM 2010 Ctrl Delay	23.8
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	61	115	56	119	118	1409	21	15	1587	132
Future Volume (vph)	139	61	115	56	119	118	1409	21	15	1587	132
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.3	22.5	22.5	10.0	17.6	14.4	70.0	70.0	5.4	55.8	55.8
Actuated g/C Ratio	0.10	0.19	0.19	0.08	0.15	0.12	0.58	0.58	0.04	0.46	0.46
v/c Ratio	0.90	0.19	0.32	0.45	0.55	0.65	0.75	0.02	0.22	1.06	0.18
Control Delay	101.1	40.7	8.0	63.6	51.3	44.3	31.6	1.2	61.3	70.5	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.1	40.7	8.0	63.6	51.3	44.3	31.6	1.2	61.3	70.5	8.5
LOS	F	D	A	E	D	D	C	A	E	E	A
Approach Delay		55.5			54.9		32.2			65.7	
Approach LOS		E			D		C			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 50.6	Intersection LOS: D
Intersection Capacity Utilization 87.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	61	115	56	119	17	118	1409	21	15	1587	132
Future Volume (veh/h)	139	61	115	56	119	17	118	1409	21	15	1587	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	148	65	70	60	127	16	126	1499	17	16	1688	92
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	169	244	208	117	162	20	128	2080	931	28	1869	816
Arrive On Green	0.10	0.14	0.14	0.07	0.10	0.10	0.03	0.20	0.20	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1568	197	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	148	65	70	60	0	143	126	1499	17	16	1688	92
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1765	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	10.8	3.9	5.0	4.3	0.0	9.5	9.3	49.1	1.1	1.2	58.0	6.2
Cycle Q Clear(g_c), s	10.8	3.9	5.0	4.3	0.0	9.5	9.3	49.1	1.1	1.2	58.0	6.2
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	244	208	117	0	183	128	2080	931	28	1869	816
V/C Ratio(X)	0.88	0.27	0.34	0.51	0.00	0.78	0.98	0.72	0.02	0.57	0.90	0.11
Avail Cap(c_a), veh/h	169	578	491	135	0	530	128	2080	931	67	1869	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.33	0.33	0.33	0.43	0.43	0.43
Uniform Delay (d), s/veh	53.0	46.5	47.0	53.7	0.0	52.5	58.4	38.4	19.2	59.2	46.1	24.8
Incr Delay (d2), s/veh	35.9	0.4	0.7	1.3	0.0	5.4	40.6	0.7	0.0	2.9	3.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	2.0	2.1	2.0	0.0	4.9	5.6	23.6	0.5	0.6	28.5	2.6
LnGrp Delay(d),s/veh	88.9	46.9	47.7	55.0	0.0	57.8	99.0	39.1	19.2	62.2	49.6	25.0
LnGrp LOS	F	D	D	D		E	F	D	B	E	D	C
Approach Vol, veh/h		283			203			1642			1796	
Approach Delay, s/veh		69.1			57.0			43.5			48.5	
Approach LOS		E			E			D			D	

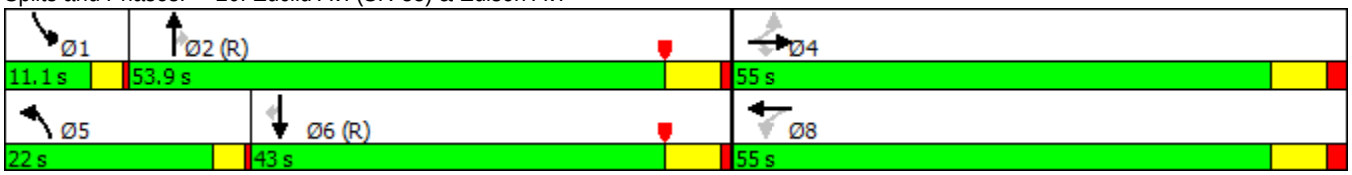
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	79.0	12.1	23.3	13.0	71.6	16.0	19.4
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	51.1	6.3	7.0	11.3	60.0	12.8	11.5
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0

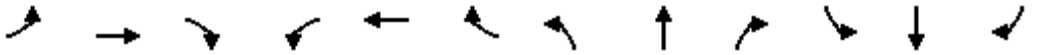
Intersection Summary	
HCM 2010 Ctrl Delay	48.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	214	166	221	66	342	245	1260	36	41	1429	247
Future Volume (vph)	214	166	221	66	342	245	1260	36	41	1429	247
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.0	44.0	44.0	44.0	44.0	21.2	54.3	54.3	6.8	38.3	38.3
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.18	0.45	0.45	0.06	0.32	0.32
v/c Ratio	1.06	0.27	0.33	0.18	0.62	0.92	0.87	0.05	0.48	1.39	0.47
Control Delay	115.7	26.8	4.2	25.4	34.6	75.2	41.7	4.9	86.2	199.0	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.7	26.8	4.2	25.4	34.6	75.2	41.7	4.9	86.2	199.0	3.3
LOS	F	C	A	C	C	E	D	A	F	F	A
Approach Delay		50.2			33.2		46.2			168.1	
Approach LOS		D			C		D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.39	
Intersection Signal Delay: 94.0	Intersection LOS: F
Intersection Capacity Utilization 112.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	214	166	221	66	342	39	245	1260	36	41	1429	247
Future Volume (veh/h)	214	166	221	66	342	39	245	1260	36	41	1429	247
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	228	177	168	70	364	39	261	1340	23	44	1520	232
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	270	720	612	392	639	69	250	1467	656	54	1054	471
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.21	0.57	0.57	0.07	0.62	0.62
Sat Flow, veh/h	942	1800	1530	994	1598	171	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	228	177	168	70	0	403	261	1340	23	44	1520	232
Grp Sat Flow(s),veh/h/ln	942	1800	1530	994	0	1770	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	26.8	7.9	8.9	6.1	0.0	21.2	18.5	42.2	0.8	3.2	37.0	10.0
Cycle Q Clear(g_c), s	48.0	7.9	8.9	13.9	0.0	21.2	18.5	42.2	0.8	3.2	37.0	10.0
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	720	612	392	0	708	250	1467	656	54	1055	471
V/C Ratio(X)	0.84	0.25	0.27	0.18	0.00	0.57	1.05	0.91	0.04	0.81	1.44	0.49
Avail Cap(c_a), veh/h	270	720	612	392	0	708	250	1467	656	103	1055	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.77	0.77	0.77	0.10	0.10	0.10
Uniform Delay (d), s/veh	47.7	24.0	24.3	28.6	0.0	28.0	47.7	23.8	14.9	55.6	23.0	17.8
Incr Delay (d2), s/veh	21.0	0.2	0.2	0.2	0.0	1.1	62.3	8.2	0.1	1.2	199.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	3.9	3.8	1.7	0.0	10.5	12.5	21.3	0.3	1.5	46.2	4.2
LnGrp Delay(d),s/veh	68.7	24.1	24.5	28.8	0.0	29.1	110.0	31.9	15.0	56.8	222.2	18.2
LnGrp LOS	E	C	C	C		C	F	C	B	E	F	B
Approach Vol, veh/h		573			473			1624			1796	
Approach Delay, s/veh		42.0			29.0			44.3			191.8	
Approach LOS		D			C			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	57.5		55.0	22.0	43.0		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.2	44.2		50.0	20.5	39.0		23.2
Green Ext Time (p_c), s	0.0	3.6		0.0	0.0	0.0		5.7

Intersection Summary		
HCM 2010 Ctrl Delay		101.7
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	54	7	202	20	44	175	1464	7	21	1661	27
Future Volume (vph)	54	7	202	20	44	175	1464	7	21	1661	27
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	21.0	63.5	63.5	9.7	52.2	52.2
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	17.5%	52.9%	52.9%	8.1%	43.5%	43.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.7	15.7	15.7	15.7	15.7	17.3	87.6	87.6	6.2	73.0	73.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.14	0.73	0.73	0.05	0.61	0.61
v/c Ratio	0.36	0.03	0.55	0.12	0.31	0.78	0.61	0.01	0.27	0.83	0.03
Control Delay	48.9	36.6	10.2	40.9	28.8	63.0	9.0	0.0	75.6	14.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	36.6	10.2	40.9	28.8	63.0	9.0	0.0	75.6	14.4	1.1
LOS	D	D	B	D	C	E	A	A	E	B	A
Approach Delay		18.8			31.4		14.7			14.9	
Approach LOS		B			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	7	202	20	44	31	175	1464	7	21	1661	27
Future Volume (veh/h)	54	7	202	20	44	31	175	1464	7	21	1661	27
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	56	7	124	21	46	25	182	1525	7	22	1730	24
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	144	189	161	183	115	63	206	2587	1157	35	2225	974
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.13	0.76	0.76	0.01	0.21	0.21
Sat Flow, veh/h	1275	1800	1530	1208	1098	597	1619	3420	1530	1619	3420	1497
Grp Volume(v), veh/h	56	7	124	21	0	71	182	1525	7	22	1730	24
Grp Sat Flow(s),veh/h/ln	1275	1800	1530	1208	0	1695	1619	1710	1530	1619	1710	1497
Q Serve(g_s), s	5.1	0.4	9.5	1.9	0.0	4.7	13.3	23.5	0.1	1.6	57.2	1.5
Cycle Q Clear(g_c), s	9.8	0.4	9.5	2.3	0.0	4.7	13.3	23.5	0.1	1.6	57.2	1.5
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	189	161	183	0	178	206	2587	1157	35	2225	974
V/C Ratio(X)	0.39	0.04	0.77	0.11	0.00	0.40	0.88	0.59	0.01	0.63	0.78	0.02
Avail Cap(c_a), veh/h	456	630	535	479	0	593	236	2587	1157	84	2225	974
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.7	48.2	52.3	49.3	0.0	50.1	51.5	6.4	3.6	59.1	38.9	17.1
Incr Delay (d2), s/veh	1.3	0.1	5.7	0.2	0.0	1.1	26.7	1.0	0.0	1.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	4.3	0.6	0.0	2.3	7.4	11.4	0.1	0.7	27.3	0.6
LnGrp Delay(d),s/veh	56.0	48.3	58.0	49.5	0.0	51.2	78.1	7.4	3.6	60.3	39.2	17.1
LnGrp LOS	E	D	E	D		D	E	A	A	E	D	B
Approach Vol, veh/h		187			92			1714			1776	
Approach Delay, s/veh		57.0			50.8			14.9			39.1	
Approach LOS		E			D			B			D	

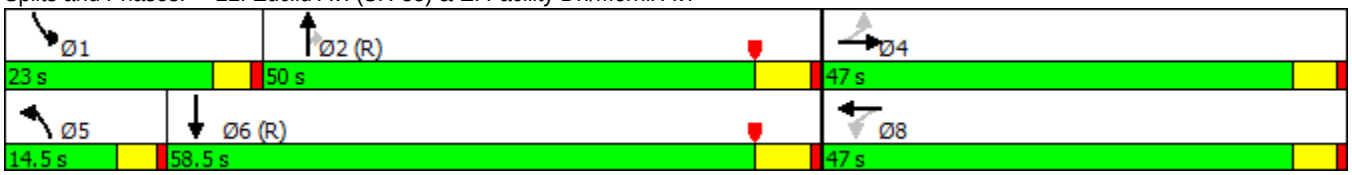
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	96.5		17.4	18.8	83.8		17.4
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	57.8		42.0	17.5	46.5		42.0
Max Q Clear Time (g_c+I1), s	3.6	25.5		11.8	15.3	59.2		6.7
Green Ext Time (p_c), s	0.0	27.8		0.8	0.1	0.0		0.8

Intersection Summary		
HCM 2010 Ctrl Delay		29.3
HCM 2010 LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	379	47	19	1030	179	475	1399
Future Volume (vph)	8	6	379	47	19	1030	179	475	1399
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		42.0		42.0	10.0	44.0	44.0	18.5	61.2
Actuated g/C Ratio		0.35		0.35	0.08	0.37	0.37	0.15	0.51
v/c Ratio		0.04		1.98	0.15	0.86	0.30	2.00	0.86
Control Delay		22.0		469.6	62.3	27.3	9.3	483.1	26.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.0		469.6	62.3	27.3	9.3	483.1	26.9
LOS		C		F	E	C	A	F	C
Approach Delay		22.0		469.6		25.2			139.9
Approach LOS		C		F		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.00	
Intersection Signal Delay: 187.0	Intersection LOS: F
Intersection Capacity Utilization 143.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	379	47	606	19	1030	179	475	1399	43
Future Volume (veh/h)	8	6	4	379	47	606	19	1030	179	475	1399	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	395	49	585	20	1073	160	495	1457	42
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	204	147	66	242	25	297	66	1254	561	250	1631	47
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.04	0.37	0.37	0.15	0.48	0.48
Sat Flow, veh/h	458	421	188	573	71	849	1619	3420	1530	1619	3395	98
Grp Volume(v), veh/h	17	0	0	1029	0	0	20	1073	160	495	733	766
Grp Sat Flow(s),veh/h/ln	1067	0	0	1493	0	0	1619	1710	1530	1619	1710	1783
Q Serve(g_s), s	0.0	0.0	0.0	41.2	0.0	0.0	1.4	34.7	8.9	18.5	46.8	47.0
Cycle Q Clear(g_c), s	0.8	0.0	0.0	42.0	0.0	0.0	1.4	34.7	8.9	18.5	46.8	47.0
Prop In Lane	0.47		0.18	0.38		0.57	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	418	0	0	564	0	0	66	1254	561	250	821	856
V/C Ratio(X)	0.04	0.00	0.00	1.82	0.00	0.00	0.30	0.86	0.29	1.98	0.89	0.89
Avail Cap(c_a), veh/h	418	0	0	564	0	0	135	1254	561	250	821	856
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	0.0	40.5	0.0	0.0	55.9	35.1	26.9	50.8	28.4	28.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	377.6	0.0	0.0	0.1	0.8	0.1	456.5	14.1	13.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	77.8	0.0	0.0	0.6	16.5	3.8	39.9	25.2	26.3
LnGrp Delay(d),s/veh	25.6	0.0	0.0	418.1	0.0	0.0	56.0	35.8	27.0	507.3	42.4	42.3
LnGrp LOS	C			F			E	D	C	F	D	D
Approach Vol, veh/h		17			1029			1253			1994	
Approach Delay, s/veh		25.6			418.1			35.0			157.8	
Approach LOS		C			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	50.0		47.0	9.4	63.6		47.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	20.5	36.7		2.8	3.4	49.0		44.0
Green Ext Time (p_c), s	0.0	6.5		6.1	0.0	3.2		0.0

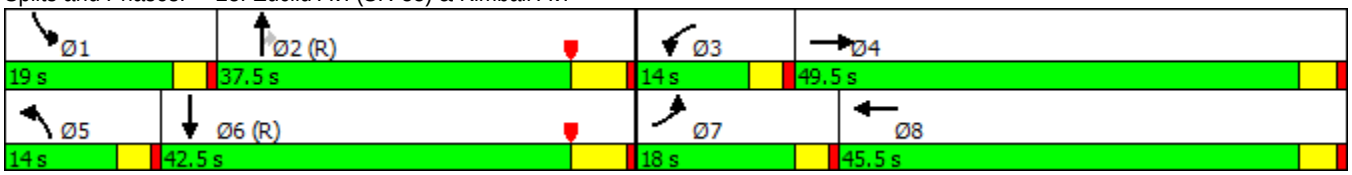
Intersection Summary	
HCM 2010 Ctrl Delay	183.8
HCM 2010 LOS	F

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	274	320	128	578	172	770	188	332	713
Future Volume (vph)	274	320	128	578	172	770	188	332	713
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	14.0	35.1	10.0	31.1	19.9	31.5	31.5	24.9	36.5
Actuated g/C Ratio	0.12	0.29	0.08	0.26	0.17	0.26	0.26	0.21	0.30
v/c Ratio	1.49	0.38	0.98	0.82	0.66	0.88	0.35	1.01	1.24
Control Delay	283.4	32.5	127.3	48.2	43.8	44.2	11.0	74.3	131.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	283.4	32.5	127.3	48.2	43.8	44.2	11.0	74.3	131.7
LOS	F	C	F	D	D	D	B	E	F
Approach Delay		140.1		60.4		38.6			120.2
Approach LOS		F		E		D			F

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.49
Intersection Signal Delay: 89.8 — Intersection LOS: F
Intersection Capacity Utilization 105.8% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	320	45	128	578	129	172	770	188	332	713	614
Future Volume (veh/h)	274	320	45	128	578	129	172	770	188	332	713	614
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	280	327	44	131	590	110	176	786	184	339	728	589
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	189	844	113	135	705	131	135	1229	550	202	723	574
Arrive On Green	0.12	0.28	0.28	0.08	0.24	0.24	0.03	0.12	0.12	0.13	0.40	0.40
Sat Flow, veh/h	1619	3034	405	1619	2880	536	1619	3420	1530	1619	1803	1433
Grp Volume(v), veh/h	280	183	188	131	350	350	176	786	184	339	690	627
Grp Sat Flow(s),veh/h/ln	1619	1710	1729	1619	1710	1705	1619	1710	1530	1619	1710	1526
Q Serve(g_s), s	14.0	10.4	10.6	9.7	23.3	23.4	10.0	26.3	13.2	15.0	48.1	48.1
Cycle Q Clear(g_c), s	14.0	10.4	10.6	9.7	23.3	23.4	10.0	26.3	13.2	15.0	48.1	48.1
Prop In Lane	1.00		0.23	1.00		0.31	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	189	476	481	135	419	418	135	1229	550	202	686	612
V/C Ratio(X)	1.48	0.38	0.39	0.97	0.84	0.84	1.30	0.64	0.33	1.68	1.01	1.03
Avail Cap(c_a), veh/h	189	641	648	135	584	583	135	1229	550	202	686	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.40	0.40	0.40	0.38	0.38	0.38
Uniform Delay (d), s/veh	53.0	35.0	35.1	54.9	43.0	43.1	58.4	45.5	39.7	52.5	35.9	35.9
Incr Delay (d2), s/veh	241.3	0.5	0.5	68.0	5.3	5.5	157.1	1.0	0.7	312.0	22.8	29.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.9	4.9	5.1	6.9	11.6	11.6	10.4	12.7	5.7	24.2	27.0	25.2
LnGrp Delay(d),s/veh	294.3	35.5	35.5	122.9	48.3	48.6	215.5	46.5	40.4	364.5	58.7	65.2
LnGrp LOS	F	D	D	F	D	D	F	D	D	F	F	F
Approach Vol, veh/h		651			831			1146			1656	
Approach Delay, s/veh		146.8			60.2			71.5			123.8	
Approach LOS		F			E			E			F	

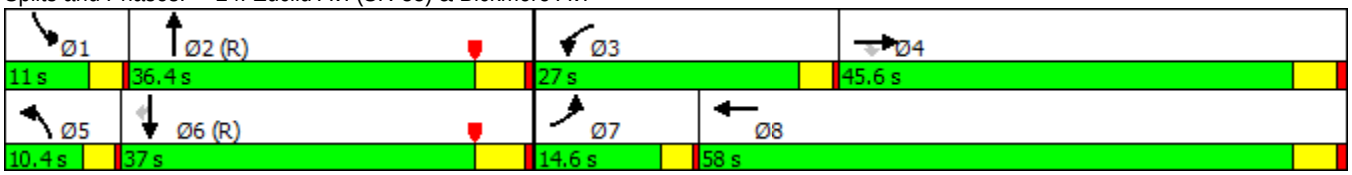
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	49.1	14.0	37.9	14.0	54.1	18.0	33.9
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	28.3	11.7	12.6	12.0	50.1	16.0	25.4
Green Ext Time (p_c), s	0.0	2.8	0.0	4.6	0.0	0.0	0.0	4.0

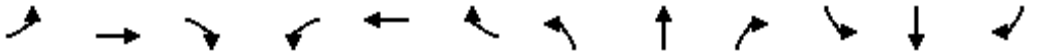
Intersection Summary	
HCM 2010 Ctrl Delay	101.0
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	85	28	51	275	403	79	763	71	674	110
Future Volume (vph)	85	28	51	275	403	79	763	71	674	110
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.8	32.6	32.6	29.7	50.5	8.0	34.6	7.6	34.2	34.2
Actuated g/C Ratio	0.08	0.27	0.27	0.25	0.42	0.07	0.29	0.06	0.28	0.28
v/c Ratio	0.69	0.06	0.11	0.73	0.95	0.78	0.87	0.75	0.74	0.23
Control Delay	79.3	27.5	0.5	56.6	55.4	44.4	34.8	60.9	21.7	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	27.5	0.5	56.6	55.4	44.4	34.8	60.9	21.7	4.9
LOS	E	C	A	E	E	D	C	E	C	A
Approach Delay		45.9			55.8		35.6		22.8	
Approach LOS		D			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 39.0	Intersection LOS: D
Intersection Capacity Utilization 87.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	28	51	275	403	253	79	763	40	71	674	110
Future Volume (veh/h)	85	28	51	275	403	253	79	763	40	71	674	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	90	30	52	293	429	256	84	812	42	76	717	108
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	110	531	451	315	446	266	93	1013	52	95	1050	470
Arrive On Green	0.07	0.30	0.30	0.19	0.42	0.42	0.02	0.10	0.10	0.02	0.10	0.10
Sat Flow, veh/h	1619	1800	1528	1619	1058	631	1619	3309	171	1619	3420	1530
Grp Volume(v), veh/h	90	30	52	293	0	685	84	420	434	76	717	108
Grp Sat Flow(s),veh/h/ln	1619	1800	1528	1619	0	1689	1619	1710	1770	1619	1710	1530
Q Serve(g_s), s	6.6	1.4	3.0	21.4	0.0	47.4	6.2	28.8	28.8	5.6	24.3	7.8
Cycle Q Clear(g_c), s	6.6	1.4	3.0	21.4	0.0	47.4	6.2	28.8	28.8	5.6	24.3	7.8
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	110	531	451	315	0	712	93	523	542	95	1050	470
V/C Ratio(X)	0.82	0.06	0.12	0.93	0.00	0.96	0.90	0.80	0.80	0.80	0.68	0.23
Avail Cap(c_a), veh/h	150	609	517	317	0	746	93	523	542	101	1050	470
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.2	30.3	30.9	47.5	0.0	33.8	58.5	50.4	50.4	58.2	48.3	40.9
Incr Delay (d2), s/veh	16.1	0.0	0.0	32.2	0.0	23.2	10.6	1.2	1.2	3.7	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.7	1.3	12.3	0.0	26.7	3.1	13.9	14.3	2.6	11.6	3.3
LnGrp Delay(d),s/veh	71.3	30.3	30.9	79.7	0.0	57.0	69.1	51.6	51.6	61.8	48.6	41.0
LnGrp LOS	E	C	C	E		E	E	D	D	E	D	D
Approach Vol, veh/h		172			978			938			901	
Approach Delay, s/veh		51.9			63.8			53.2			48.8	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	42.2	26.9	40.4	10.4	42.3	11.7	55.6
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	7.6	30.8	23.4	5.0	8.2	26.3	8.6	49.4
Green Ext Time (p_c), s	0.0	0.1	0.0	3.3	0.0	2.8	0.0	1.2

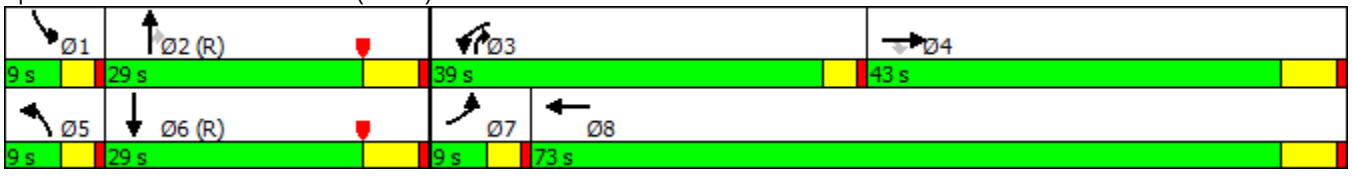
Intersection Summary	
HCM 2010 Ctrl Delay	55.3
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	218	33	879	166	58	864	496	82	897
Future Volume (vph)	5	218	33	879	166	58	864	496	82	897
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	22.8	22.8	35.0	60.0	8.4	30.0	67.0	12.3	33.8
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.25	0.56	0.10	0.28
v/c Ratio	0.07	0.65	0.08	1.03	0.30	0.52	1.02	0.49	0.50	0.96
Control Delay	57.8	52.5	0.4	81.2	15.2	62.9	84.6	3.1	66.7	46.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.5	0.4	81.2	15.2	62.9	84.6	3.1	66.7	46.2
LOS	E	D	A	F	B	E	F	A	E	D
Approach Delay		45.9			66.2		55.2			47.9
Approach LOS		D			E		E			D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 56.0 — Intersection LOS: E
Intersection Capacity Utilization 89.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	218	33	879	166	92	58	864	496	82	897	15
Future Volume (veh/h)	5	218	33	879	166	92	58	864	496	82	897	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	220	0	888	168	78	59	873	323	83	906	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	292	249	862	519	241	67	1154	951	67	1169	13
Arrive On Green	0.01	0.16	0.00	0.29	0.45	0.45	0.04	0.34	0.34	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1159	538	1619	3420	1496	1619	3464	38
Grp Volume(v), veh/h	5	220	0	888	0	246	59	873	323	83	447	469
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1697	1619	1710	1496	1619	1710	1792
Q Serve(g_s), s	0.4	14.0	0.0	35.0	0.0	11.2	4.3	27.2	12.3	5.0	30.5	30.5
Cycle Q Clear(g_c), s	0.4	14.0	0.0	35.0	0.0	11.2	4.3	27.2	12.3	5.0	30.5	30.5
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	10	292	249	862	0	760	67	1154	951	67	577	605
V/C Ratio(X)	0.48	0.75	0.00	1.03	0.00	0.32	0.87	0.76	0.34	1.23	0.77	0.77
Avail Cap(c_a), veh/h	67	555	472	862	0	948	67	1154	951	67	577	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.34	0.34	0.34	0.65	0.65	0.65
Uniform Delay (d), s/veh	59.4	48.0	0.0	42.5	0.0	21.4	57.2	35.4	10.5	59.2	48.9	48.9
Incr Delay (d2), s/veh	12.4	5.5	0.0	38.6	0.0	0.3	31.6	1.6	0.3	162.4	6.5	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.4	0.0	18.9	0.0	5.3	2.5	13.1	5.1	5.3	15.5	16.2
LnGrp Delay(d),s/veh	71.8	53.4	0.0	81.1	0.0	21.8	88.8	37.0	10.9	221.6	55.4	55.1
LnGrp LOS	E	D		F		C	F	D	B	F	E	E
Approach Vol, veh/h		225			1134			1255			999	
Approach Delay, s/veh		53.8			68.2			32.7			69.1	
Approach LOS		D			E			C			E	

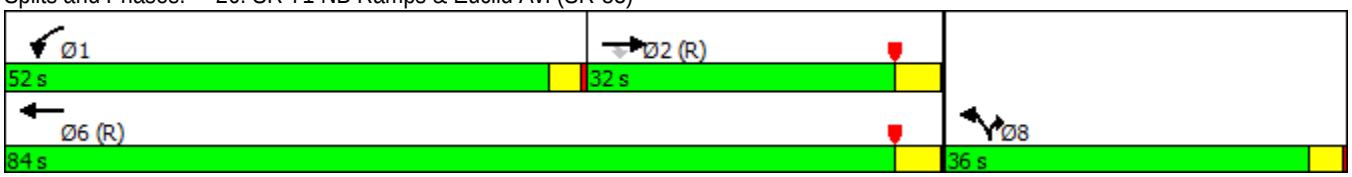
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	46.5	39.0	25.5	9.0	46.5	4.8	59.7
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	7.0	29.2	37.0	16.0	6.3	32.5	2.4	13.2
Green Ext Time (p_c), s	0.0	0.0	0.0	3.5	0.0	0.0	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	55.2
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	538	300	590	1211	72	915
Future Volume (vph)	538	300	590	1211	72	915
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	32.0	32.0	52.0	84.0	36.0	36.0
Total Split (%)	26.7%	26.7%	43.3%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	30.2	30.2	45.8	79.5	32.5	32.5
Actuated g/C Ratio	0.25	0.25	0.38	0.66	0.27	0.27
v/c Ratio	0.65	0.51	0.94	0.56	0.08	1.02
Control Delay	66.0	27.7	46.6	1.0	33.1	47.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.0	27.7	46.6	1.0	33.1	47.2
LOS	E	C	D	A	C	D
Approach Delay	52.3			16.0	46.2	
Approach LOS	D			B	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 32.6	Intersection LOS: C
Intersection Capacity Utilization 82.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	538	300	590	1211	72	915
Future Volume (veh/h)	538	300	590	1211	72	915
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	560	0	615	1261	75	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1677	750	638	3050	139	64
Arrive On Green	0.98	0.00	0.37	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	560	0	615	1261	75	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.6	0.0	42.1	7.6	2.7	0.0
Cycle Q Clear(g_c), s	0.6	0.0	42.1	7.6	2.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1677	750	638	3050	139	64
V/C Ratio(X)	0.33	0.00	0.96	0.41	0.54	0.00
Avail Cap(c_a), veh/h	1677	750	693	3050	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.14	0.14	1.00	0.00
Uniform Delay (d), s/veh	0.6	0.0	36.9	1.1	56.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	6.1	0.1	3.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	21.1	3.5	1.3	0.0
LnGrp Delay(d),s/veh	1.1	0.0	43.0	1.2	59.6	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	560			1876	75	
Approach Delay, s/veh	1.1			14.9	59.6	
Approach LOS	A			B	E	

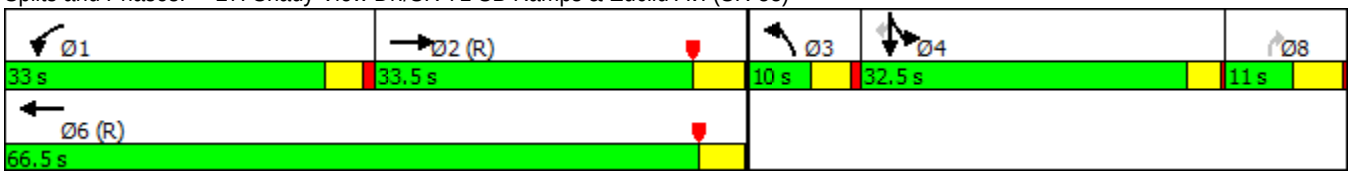
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	48.2	63.3				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	48.5	27.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	44.1	2.6				9.6		4.7
Green Ext Time (p_c), s	0.5	11.5				15.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	802	396	242	62	300	271	21	36
Future Volume (vph)	802	396	242	62	300	271	21	36
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	33.5	33.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	27.9%	27.5%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	28.5	37.5	71.0	5.5	7.3	18.7	18.7	18.7
Actuated g/C Ratio	0.24	0.31	0.59	0.05	0.06	0.16	0.16	0.16
v/c Ratio	1.11	0.86	0.13	0.92	0.82	0.67	0.62	0.11
Control Delay	108.6	59.0	3.6	141.2	22.9	60.6	57.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.6	59.0	3.6	141.2	22.9	60.6	57.0	0.6
LOS	F	E	A	F	C	E	E	A
Approach Delay	108.6		38.0				52.4	
Approach LOS	F		D				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 68.0	Intersection LOS: E
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	802	17	396	242	0	62	0	300	271	21	36
Future Volume (veh/h)	0	802	17	396	242	0	62	0	300	271	21	36
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	881	19	435	266	0	68	0	330	314	0	40
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1829	39	385	2768	0	0	0	0	388	0	183
Arrive On Green	0.00	0.53	0.53	0.40	1.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Sat Flow, veh/h	0	3513	74	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	440	460	435	266	0		0.0		314	0	40
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	19.4	19.4	28.5	0.0	0.0				11.3	0.0	2.8
Cycle Q Clear(g_c), s	0.0	19.4	19.4	28.5	0.0	0.0				11.3	0.0	2.8
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	914	955	385	2768	0				388	0	183
V/C Ratio(X)	0.00	0.48	0.48	1.13	0.10	0.00				0.81	0.00	0.22
Avail Cap(c_a), veh/h	0	914	955	385	2768	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.5	17.5	36.2	0.0	0.0				51.5	0.0	47.7
Incr Delay (d2), s/veh	0.0	1.8	1.7	86.6	0.1	0.0				4.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.5	9.9	21.9	0.0	0.0				5.3	0.0	1.2
LnGrp Delay(d),s/veh	0.0	19.3	19.3	122.8	0.1	0.0				55.5	0.0	48.3
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		900			701						354	
Approach Delay, s/veh		19.3			76.2						54.7	
Approach LOS		B			E						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	33.0	69.1		17.9		102.1		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	28.5	28.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	30.5	21.4		13.3		2.0		
Green Ext Time (p_c), s	0.0	2.8		1.0		5.0		

Intersection Summary	
HCM 2010 Ctrl Delay	46.1
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	953	0	0	1353	0	0	0	0	1	0	0
Future Vol, veh/h	3	953	0	0	1353	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	1047	0	0	1487	0	0	0	0	1	0	0

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	1487	0	-	-	-	0	2017	2541	743
Stage 1	-	-	-	-	-	-	1487	1487	-
Stage 2	-	-	-	-	-	-	530	1054	-
Critical Hdwy	4.1	-	-	-	-	-	6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	458	-	0	0	-	-	52	27	362
Stage 1	-	-	0	0	-	-	209	190	-
Stage 2	-	-	0	0	-	-	560	305	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	458	-	-	-	-	-	52	0	362
Mov Cap-2 Maneuver	-	-	-	-	-	-	188	0	-
Stage 1	-	-	-	-	-	-	209	0	-
Stage 2	-	-	-	-	-	-	556	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	458	-	-	-	188
HCM Lane V/C Ratio	0.007	-	-	-	0.006
HCM Control Delay (s)	12.9	-	-	-	24.3
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	823	34	21	928	58	47
Future Vol, veh/h	823	34	21	928	58	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	857	35	22	967	60	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	893	0	1885	446
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	1010	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	768	-	71	565
Stage 1	-	-	-	-	373	-
Stage 2	-	-	-	-	355	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	768	-	69	565
Mov Cap-2 Maneuver	-	-	-	-	248	-
Stage 1	-	-	-	-	373	-
Stage 2	-	-	-	-	345	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	18.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	248	565	-	-	768	-
HCM Lane V/C Ratio	0.244	0.087	-	-	0.028	-
HCM Control Delay (s)	24.1	12	-	-	9.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.9	0.3	-	-	0.1	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	806	32	788	161	39
Future Volume (vph)	806	32	788	161	39
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	25.4	5.1	28.7	10.3	10.3
Actuated g/C Ratio	0.50	0.10	0.57	0.20	0.20
v/c Ratio	0.56	0.21	0.85	0.54	0.12
Control Delay	10.6	28.0	17.8	29.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	28.0	17.8	29.4	9.2
LOS	B	C	B	C	A
Approach Delay	10.6		18.2	25.5	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 50.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	806	63	32	788	161	39
Future Volume (veh/h)	806	63	32	788	161	39
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	886	69	35	866	177	40
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1528	119	61	1081	304	287
Arrive On Green	0.48	0.48	0.04	0.60	0.19	0.19
Sat Flow, veh/h	3299	250	1619	1800	1619	1530
Grp Volume(v), veh/h	472	483	35	866	177	40
Grp Sat Flow(s),veh/h/ln	1710	1749	1619	1800	1619	1530
Q Serve(g_s), s	10.6	10.6	1.1	19.7	5.3	1.2
Cycle Q Clear(g_c), s	10.6	10.6	1.1	19.7	5.3	1.2
Prop In Lane		0.14	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	814	833	61	1081	304	287
V/C Ratio(X)	0.58	0.58	0.57	0.80	0.58	0.14
Avail Cap(c_a), veh/h	934	955	152	1307	304	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	10.1	25.2	8.2	19.7	18.1
Incr Delay (d2), s/veh	0.7	0.7	3.1	3.1	7.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	5.3	0.6	10.5	3.0	0.6
LnGrp Delay(d),s/veh	10.8	10.8	28.3	11.3	27.7	19.1
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	955			901	217	
Approach Delay, s/veh	10.8			11.9	26.1	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.6	31.6				38.2		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	3.1	12.6				21.7		7.3
Green Ext Time (p_c), s	0.0	10.0				10.2		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	734	69	597	223	80
Future Volume (vph)	734	69	597	223	80
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	21.6	5.5	26.9	13.9	13.9
Actuated g/C Ratio	0.42	0.11	0.52	0.27	0.27
v/c Ratio	0.71	0.46	0.72	0.58	0.21
Control Delay	16.3	36.2	14.0	27.2	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	36.2	14.0	27.2	17.4
LOS	B	D	B	C	B
Approach Delay	16.3		16.3	24.6	
Approach LOS	B		B	C	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 52			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 17.7		Intersection LOS: B	
Intersection Capacity Utilization 57.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	734	136	69	597	223	80
Future Volume (veh/h)	734	136	69	597	223	80
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	825	153	78	671	251	72
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1156	214	103	994	401	379
Arrive On Green	0.40	0.40	0.06	0.55	0.25	0.25
Sat Flow, veh/h	2957	532	1619	1800	1619	1530
Grp Volume(v), veh/h	492	486	78	671	251	72
Grp Sat Flow(s),veh/h/ln	1710	1689	1619	1800	1619	1530
Q Serve(g_s), s	13.0	13.0	2.6	14.4	7.5	2.0
Cycle Q Clear(g_c), s	13.0	13.0	2.6	14.4	7.5	2.0
Prop In Lane		0.31	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	690	681	103	994	401	379
V/C Ratio(X)	0.71	0.71	0.75	0.68	0.63	0.19
Avail Cap(c_a), veh/h	816	806	162	1192	401	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	13.5	24.9	8.6	18.1	16.0
Incr Delay (d2), s/veh	2.4	2.4	4.1	1.2	7.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	6.4	1.3	7.2	4.1	0.9
LnGrp Delay(d),s/veh	15.9	15.9	29.0	9.8	25.3	17.1
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	978			749	323	
Approach Delay, s/veh	15.9			11.8	23.5	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.0	28.0				36.0		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.6	15.0				16.4		9.5
Green Ext Time (p_c), s	0.0	6.7				9.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	66.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	396	407	11	5	457	122	19	19	18	95	12	192
Future Vol, veh/h	396	407	11	5	457	122	19	19	18	95	12	192
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	417	428	12	5	481	128	20	20	19	100	13	202

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	610	0	0	442	0	0	1933	1891	223	1616	1833	546
Stage 1	-	-	-	-	-	-	1270	1270	-	557	557	-
Stage 2	-	-	-	-	-	-	663	621	-	1059	1276	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	979	-	-	1129	-	-	45	71	787	~ 77	77	541
Stage 1	-	-	-	-	-	-	181	241	-	518	515	-
Stage 2	-	-	-	-	-	-	454	482	-	243	240	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	979	-	-	1128	-	-	~ 17	40	785	~ 36	44	540
Mov Cap-2 Maneuver	-	-	-	-	-	-	192	53	-	~ 86	108	-
Stage 1	-	-	-	-	-	-	104	138	-	297	512	-
Stage 2	-	-	-	-	-	-	276	479	-	116	138	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.5	0.1	63.6	$ 361.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	117	979	-	-	1128	-	-	190
HCM Lane V/C Ratio	0.504	0.426	-	-	0.005	-	-	1.657
HCM Control Delay (s)	63.6	11.4	-	-	8.2	-	-	$ 361.3
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	2.3	2.2	-	-	0	-	-	21.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	396	15	25	510	8	57	0	21	2	0	16
Future Vol, veh/h	109	396	15	25	510	8	57	0	21	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	435	16	27	560	9	63	0	23	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	569	0	0	453	0	0	1016	1305	227	1075	1310	285
Stage 1	-	-	-	-	-	-	681	681	-	620	620	-
Stage 2	-	-	-	-	-	-	335	624	-	455	690	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1013	-	-	1118	-	-	195	162	782	177	160	718
Stage 1	-	-	-	-	-	-	411	453	-	447	483	-
Stage 2	-	-	-	-	-	-	658	481	-	560	449	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1013	-	-	1118	-	-	170	140	781	154	138	718
Mov Cap-2 Maneuver	-	-	-	-	-	-	313	280	-	154	138	-
Stage 1	-	-	-	-	-	-	363	400	-	395	471	-
Stage 2	-	-	-	-	-	-	627	469	-	480	396	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.4	17.5	12.3
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	373	1013	-	-	1118	-	-	510
HCM Lane V/C Ratio	0.23	0.117	-	-	0.025	-	-	0.038
HCM Control Delay (s)	17.5	9	-	-	8.3	-	-	12.3
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.9	0.4	-	-	0.1	-	-	0.1

Intersection	
Intersection Delay, s/veh	25.7
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	228	0	192	0	0	0	0	0	289	456	0
Future Vol, veh/h	0	228	0	192	0	0	0	0	0	289	456	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	245	0	206	0	0	0	0	0	311	490	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	17	36
HCM LOS	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	289	456	228	192	118	251
LT Vol	289	0	228	0	0	0
Through Vol	0	456	0	0	118	0
RT Vol	0	0	0	192	0	251
Lane Flow Rate	311	490	245	206	127	270
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.62	0.909	0.541	0.385	0.26	0.5
Departure Headway (Hd)	7.182	6.671	7.941	6.716	7.39	6.67
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	500	539	451	531	488	542
Service Time	4.982	4.471	5.74	4.514	5.09	4.37
HCM Lane V/C Ratio	0.622	0.909	0.543	0.388	0.26	0.498
HCM Control Delay	21.1	45.5	19.8	13.7	12.7	15.9
HCM Lane LOS	C	E	C	B	B	C
HCM 95th-tile Q	4.2	10.8	3.1	1.8	1	2.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↑	↱
Traffic Vol, veh/h	0	0	118	251
Future Vol, veh/h	0	0	118	251
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	127	270
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	14.9
HCM LOS	B

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1159	688	18	956	418	235	693
Future Volume (vph)	1159	688	18	956	418	235	693
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.41	0.74	0.14	0.58	0.66	0.62	1.24
Control Delay	11.5	11.2	37.4	9.4	24.8	22.6	142.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	11.2	37.4	9.4	24.8	22.6	142.6
LOS	B	B	D	A	C	C	F
Approach Delay	11.4			9.9		84.9	
Approach LOS	B			A		F	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1159	688	18	956	0	0	0	0	418	235	693
Future Volume (veh/h)	0	1159	688	18	956	0	0	0	0	418	235	693
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1220	598	19	1006	0				344	382	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2492	607	37	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.05	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1220	598	19	1006	0				344	382	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	8.8	23.6	0.7	0.0	0.0				10.8	10.8	0.0
Cycle Q Clear(g_c), s	0.0	8.8	23.6	0.7	0.0	0.0				10.8	10.8	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2492	607	37	1739	0				540	600	510
V/C Ratio(X)	0.00	0.49	0.99	0.52	0.58	0.00				0.64	0.64	0.00
Avail Cap(c_a), veh/h	0	2492	607	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.77	0.77	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.3	17.8	28.3	0.0	0.0				16.9	16.9	0.0
Incr Delay (d2), s/veh	0.0	0.1	32.8	3.2	1.1	0.0				5.7	5.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	15.2	0.3	0.3	0.0				5.6	6.2	0.0
LnGrp Delay(d),s/veh	0.0	13.5	50.6	31.6	1.1	0.0				22.6	22.0	0.0
LnGrp LOS		B	D	C	A					C	C	
Approach Vol, veh/h		1818			1025						726	
Approach Delay, s/veh		25.7			1.7						22.3	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.4	28.6		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	25.6		12.8		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.6		21.6		

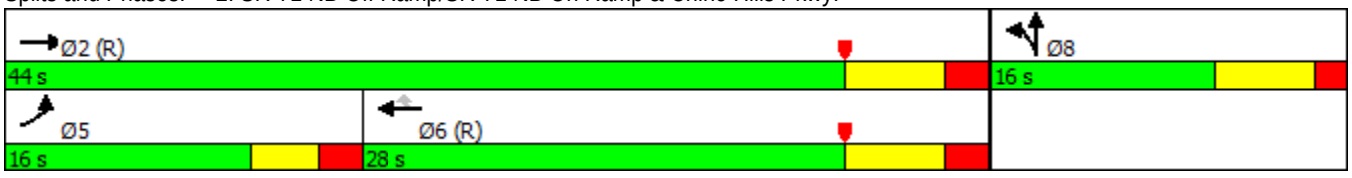
Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	410	1166	622	579	352	106
Future Volume (vph)	410	1166	622	579	352	106
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.9	37.5	21.6	21.6	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.82	0.59	0.54	0.90	0.77	0.58
Control Delay	38.0	9.4	17.4	30.7	47.9	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	9.4	17.4	30.7	47.9	27.9
LOS	D	A	B	C	D	C
Approach Delay		16.8	23.8			35.5
Approach LOS		B	C			D

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	410	1166	0	0	622	579	352	106	5	0	0	0
Future Volume (veh/h)	410	1166	0	0	622	579	352	106	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	441	1254	0	0	669	620	378	114	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	528	2138	0	0	1242	548	540	297	3			
Arrive On Green	0.18	0.63	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1782	16			
Grp Volume(v), veh/h	441	1254	0	0	669	620	378	0	115			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	8.6	13.0	0.0	0.0	9.3	21.8	6.6	0.0	3.4			
Cycle Q Clear(g_c), s	8.6	13.0	0.0	0.0	9.3	21.8	6.6	0.0	3.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	528	2138	0	0	1242	548	540	0	300			
V/C Ratio(X)	0.84	0.59	0.00	0.00	0.54	1.13	0.70	0.00	0.38			
Avail Cap(c_a), veh/h	542	2138	0	0	1242	548	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.88	0.88	0.00	0.00	0.53	0.53	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.8	6.7	0.0	0.0	15.1	19.1	23.6	0.0	22.3			
Incr Delay (d2), s/veh	9.6	1.0	0.0	0.0	0.9	71.8	7.4	0.0	3.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.2	6.2	0.0	0.0	4.5	19.9	3.5	0.0	2.0			
LnGrp Delay(d),s/veh	33.4	7.7	0.0	0.0	16.0	90.9	31.0	0.0	26.0			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1695			1289			493				
Approach Delay, s/veh		14.4			52.0			29.8				
Approach LOS		B			D			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			15.7	28.3		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		15.0			10.6	23.8		8.6
Green Ext Time (p_c), s		16.5			0.1	0.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	30.5
HCM 2010 LOS	C

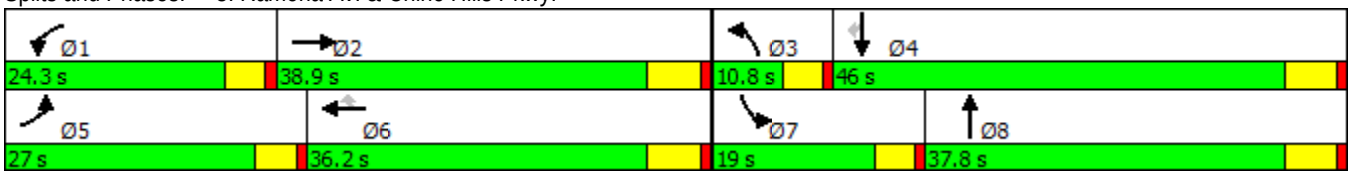
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	256	913	143	762	133	22	295	160	463	416
Future Volume (vph)	256	913	143	762	133	22	295	160	463	416
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	21.5	36.7	15.0	30.2	30.2	5.7	32.0	13.9	44.2	44.2
Actuated g/C Ratio	0.18	0.31	0.13	0.25	0.25	0.05	0.27	0.12	0.37	0.37
v/c Ratio	0.93	0.64	0.75	0.93	0.28	0.30	0.50	0.90	0.39	0.53
Control Delay	85.7	38.2	71.4	61.2	6.3	65.0	33.7	95.9	29.5	5.2
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.7	38.5	71.4	61.2	6.3	65.0	33.7	95.9	29.5	5.2
LOS	F	D	E	E	A	E	C	F	C	A
Approach Delay		48.9		55.6			35.2		30.0	
Approach LOS		D		E			D		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 118.5
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 43.8 — Intersection LOS: D
Intersection Capacity Utilization 92.0% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	913	2	143	762	133	22	295	139	160	463	416
Future Volume (veh/h)	256	913	2	143	762	133	22	295	139	160	463	416
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	272	971	2	152	811	96	23	314	93	170	493	333
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	295	1648	3	177	863	381	36	703	204	194	1256	554
Arrive On Green	0.18	0.33	0.33	0.11	0.25	0.25	0.02	0.27	0.27	0.12	0.37	0.37
Sat Flow, veh/h	1619	5064	10	1619	3420	1509	1619	2605	757	1619	3420	1507
Grp Volume(v), veh/h	272	628	345	152	811	96	23	204	203	170	493	333
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1652	1619	1710	1507
Q Serve(g_s), s	19.6	19.0	19.0	10.9	27.5	6.0	1.7	11.7	12.1	12.2	12.6	21.3
Cycle Q Clear(g_c), s	19.6	19.0	19.0	10.9	27.5	6.0	1.7	11.7	12.1	12.2	12.6	21.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	295	1066	585	177	863	381	36	462	446	194	1256	554
V/C Ratio(X)	0.92	0.59	0.59	0.86	0.94	0.25	0.63	0.44	0.45	0.88	0.39	0.60
Avail Cap(c_a), veh/h	306	1066	585	269	877	387	85	462	446	197	1256	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	33.4	33.4	51.9	43.4	35.4	57.4	35.9	36.0	51.3	27.7	30.4
Incr Delay (d2), s/veh	30.6	1.0	1.9	10.6	17.6	0.5	6.6	3.1	3.3	31.6	0.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	8.7	9.7	5.4	15.1	2.5	0.8	5.9	5.9	7.2	6.1	9.5
LnGrp Delay(d),s/veh	78.2	34.4	35.2	62.5	61.0	35.9	64.1	38.9	39.3	82.9	28.6	35.2
LnGrp LOS	E	C	D	E	E	D	E	D	D	F	C	D
Approach Vol, veh/h		1245			1059			430			996	
Approach Delay, s/veh		44.2			58.9			40.5			40.1	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.5	44.4	7.3	49.3	26.2	35.7	18.8	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	12.9	21.0	3.7	23.3	21.6	29.5	14.2	14.1
Green Ext Time (p_c), s	0.1	9.7	0.0	6.1	0.0	0.4	0.0	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	46.9
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	903	124	46	867	90	28
Future Vol, veh/h	903	124	46	867	90	28
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1003	138	51	963	100	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1006	0	1590	505
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	584	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	697	-	100	518
Stage 1	-	-	-	-	319	-
Stage 2	-	-	-	-	526	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	697	-	~ 92	517
Mov Cap-2 Maneuver	-	-	-	-	265	-
Stage 1	-	-	-	-	318	-
Stage 2	-	-	-	-	488	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	26
HCM LOS			D

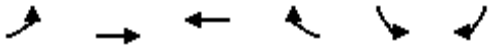
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	300	-	-	697	-
HCM Lane V/C Ratio	0.437	-	-	0.073	-
HCM Control Delay (s)	26	-	-	10.6	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.1	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	124	807	672	60	241
Future Volume (vph)	124	807	672	60	241
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	11.2	42.3	26.4	23.6	36.0
Actuated g/C Ratio	0.14	0.54	0.34	0.30	0.46
v/c Ratio	0.58	0.47	0.69	0.07	0.34
Control Delay	42.8	11.3	25.4	23.3	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	11.3	25.4	23.3	7.9
LOS	D	B	C	C	A
Approach Delay		15.5	25.4	11.0	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 77.7	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 59.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	124	807	672	62	60	241
Future Volume (veh/h)	124	807	672	62	60	241
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	135	877	730	65	65	76
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	166	2000	1355	121	818	580
Arrive On Green	0.10	0.58	0.43	0.43	0.28	0.28
Sat Flow, veh/h	1619	3510	3261	282	2956	1530
Grp Volume(v), veh/h	135	877	394	401	65	76
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1743	1478	1530
Q Serve(g_s), s	6.8	12.0	14.3	14.4	1.4	2.7
Cycle Q Clear(g_c), s	6.8	12.0	14.3	14.4	1.4	2.7
Prop In Lane	1.00			0.16	1.00	1.00
Lane Grp Cap(c), veh/h	166	2000	731	745	818	580
V/C Ratio(X)	0.81	0.44	0.54	0.54	0.08	0.13
Avail Cap(c_a), veh/h	549	3476	1065	1085	818	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	9.7	17.9	17.9	22.4	17.0
Incr Delay (d2), s/veh	3.6	0.2	0.9	0.9	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	5.7	7.0	7.1	0.6	2.9
LnGrp Delay(d),s/veh	40.4	9.9	18.7	18.7	22.6	17.5
LnGrp LOS	D	A	B	B	C	B
Approach Vol, veh/h		1012	795		141	
Approach Delay, s/veh		14.0	18.7		19.8	
Approach LOS		B	B		B	

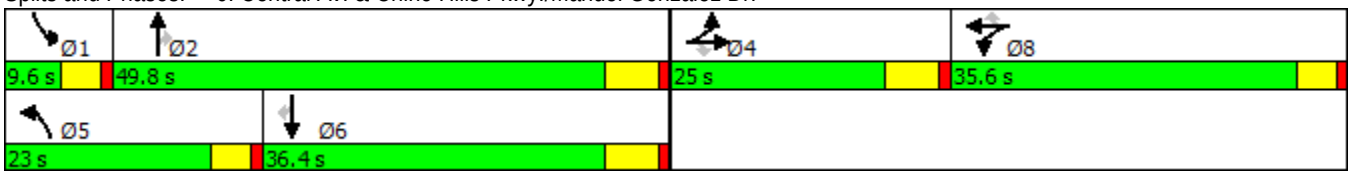
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		54.8		29.0	13.2	41.6		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		14.0		4.7	8.8	16.4		
Green Ext Time (p_c), s		25.7		0.4	0.1	19.5		

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	494	2	412	11	42	33	315	747	1	10	843	231
Future Volume (vph)	494	2	412	11	42	33	315	747	1	10	843	231
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.90	0.86	0.68	0.05	0.19	0.10	1.14	0.45	0.00	0.14	0.87	0.44
Control Delay	74.9	66.9	10.0	37.5	40.3	0.6	134.9	18.7	0.0	54.2	44.3	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.9	66.9	10.0	37.5	40.3	0.6	134.9	18.7	0.0	54.2	44.3	15.5
LOS	E	E	A	D	D	A	F	B	A	D	D	B
Approach Delay		43.2			24.8			53.1			38.2	
Approach LOS		D			C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 44.3	Intersection LOS: D
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	494	2	412	11	42	33	315	747	1	10	843	231
Future Volume (veh/h)	494	2	412	11	42	33	315	747	1	10	843	231
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	538	0	320	12	46	19	342	812	1	11	916	181
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	632	0	299	155	172	145	303	1658	741	21	1064	469
Arrive On Green	0.20	0.00	0.20	0.10	0.10	0.10	0.19	0.48	0.48	0.01	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	538	0	320	12	46	19	342	812	1	11	916	181
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	15.8	0.0	19.2	0.7	2.3	1.1	18.4	15.8	0.0	0.7	24.8	9.2
Cycle Q Clear(g_c), s	15.8	0.0	19.2	0.7	2.3	1.1	18.4	15.8	0.0	0.7	24.8	9.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	632	0	299	155	172	145	303	1658	741	21	1064	469
V/C Ratio(X)	0.85	0.00	1.07	0.08	0.27	0.13	1.13	0.49	0.00	0.51	0.86	0.39
Avail Cap(c_a), veh/h	632	0	299	510	567	479	303	1658	741	82	1064	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	0.0	39.6	40.6	41.3	40.8	40.0	17.1	13.1	48.2	31.9	26.5
Incr Delay (d2), s/veh	10.8	0.0	72.4	0.2	0.8	0.4	91.4	1.0	0.0	7.0	9.2	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.0	14.1	0.3	1.2	0.5	15.8	7.7	0.0	0.3	13.1	4.1
LnGrp Delay(d),s/veh	49.0	0.0	112.0	40.8	42.1	41.2	131.4	18.2	13.1	55.2	41.1	28.9
LnGrp LOS	D		F	D	D	D	F	B	B	E	D	C
Approach Vol, veh/h		858			77			1155			1108	
Approach Delay, s/veh		72.5			41.7			51.7			39.2	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	53.5		25.0	23.0	36.4		14.0
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	17.8		21.2	20.4	26.8		4.3
Green Ext Time (p_c), s	0.0	18.2		0.0	0.0	3.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	52.7
HCM 2010 LOS	D

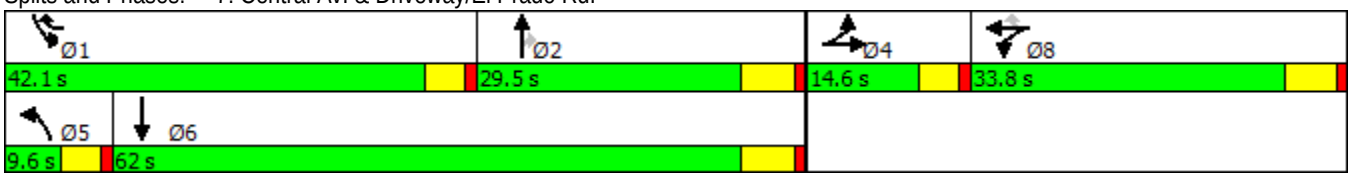
Notes

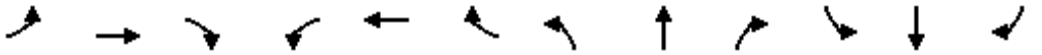
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	26	5	729	4	457	9	572	820	567	709
Future Volume (vph)	26	5	729	4	457	9	572	820	567	709
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	28.1	28.1	71.5	5.0	23.8	23.8	37.6	64.1
Actuated g/C Ratio	0.09	0.09	0.24	0.24	0.61	0.04	0.20	0.20	0.32	0.55
v/c Ratio	0.20	0.17	1.03	0.98	0.47	0.13	0.86	1.07	1.14	0.28
Control Delay	55.0	26.6	100.3	87.1	8.1	59.8	59.2	67.4	122.1	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	26.6	100.3	87.1	8.1	59.8	59.2	67.4	122.1	15.4
LOS	E	C	F	F	A	E	E	E	F	B
Approach Delay		41.1		60.8			64.0			62.2
Approach LOS		D		E			E			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 117.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 62.1 — Intersection LOS: E
Intersection Capacity Utilization 109.6% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	5	20	729	4	457	9	572	820	567	709	18
Future Volume (veh/h)	26	5	20	729	4	457	9	572	820	567	709	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	27	5	12	762	0	325	9	596	678	591	739	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	105	31	73	771	0	852	18	689	304	516	2525	51
Arrive On Green	0.06	0.06	0.06	0.24	0.00	0.24	0.01	0.20	0.20	0.32	0.51	0.51
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4955	100
Grp Volume(v), veh/h	27	0	17	762	0	325	9	596	678	591	488	266
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.9	0.0	1.2	27.6	0.0	14.1	0.7	19.8	23.7	37.5	10.1	10.1
Cycle Q Clear(g_c), s	1.9	0.0	1.2	27.6	0.0	14.1	0.7	19.8	23.7	37.5	10.1	10.1
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	105	0	104	771	0	852	18	689	304	516	1669	907
V/C Ratio(X)	0.26	0.00	0.16	0.99	0.00	0.38	0.51	0.86	2.23	1.14	0.29	0.29
Avail Cap(c_a), veh/h	138	0	136	771	0	852	69	689	304	516	1669	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	0.0	52.0	44.7	0.0	14.7	57.9	45.4	47.0	40.1	16.6	16.6
Incr Delay (d2), s/veh	0.5	0.0	0.3	29.5	0.0	0.3	8.4	13.7	564.9	86.1	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	15.4	0.0	5.9	0.3	10.7	57.5	29.0	4.6	5.2
LnGrp Delay(d),s/veh	52.8	0.0	52.3	74.1	0.0	14.9	66.2	59.1	611.8	126.2	17.1	17.5
LnGrp LOS	D		D	E		B	E	E	F	F	B	B
Approach Vol, veh/h		44			1087			1283			1345	
Approach Delay, s/veh		52.6			56.4			351.2			65.1	
Approach LOS		D			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.2	5.9	65.7		33.8
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.5	25.7		3.9	2.7	12.1		29.6
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	24.8		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		160.1
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1286	893	158
Future Volume (vph)	1286	893	158
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	85.8	85.8	24.7
Actuated g/C Ratio	0.72	0.72	0.21
v/c Ratio	0.51	0.27	1.05dr
Control Delay	5.3	6.7	52.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.3	6.7	52.2
LOS	A	A	D
Approach Delay	5.3	6.7	52.2
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1286	382	0	893	158	341
Future Volume (veh/h)	1286	382	0	893	158	341
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1354	402	0	940	166	198
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2912	861	0	3799	239	226
Arrive On Green	1.00	1.00	0.00	0.77	0.15	0.15
Sat Flow, veh/h	3928	1114	0	5238	1619	1530
Grp Volume(v), veh/h	1177	579	0	940	166	198
Grp Sat Flow(s),veh/h/ln	1638	1603	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	6.4	11.7	15.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.4	11.7	15.2
Prop In Lane		0.69	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2533	1240	0	3799	239	226
V/C Ratio(X)	0.46	0.47	0.00	0.25	0.69	0.88
Avail Cap(c_a), veh/h	2533	1240	0	3799	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.8	48.6	50.1
Incr Delay (d2), s/veh	0.6	1.3	0.0	0.2	1.4	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.0	2.9	5.3	6.7
LnGrp Delay(d),s/veh	0.6	1.3	0.0	4.0	49.9	54.3
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1756			940	364	
Approach Delay, s/veh	0.8			4.0	52.3	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		97.3				97.3		22.7
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				8.4		17.2
Green Ext Time (p_c), s		21.6				21.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	7.9
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	716	88	702	951	0
Future Volume (vph)	716	88	702	951	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	31.9	31.9	31.9	80.1	80.1
Actuated g/C Ratio	0.27	0.27	0.27	0.67	0.67
v/c Ratio	0.55	0.19	0.81	0.85	0.89
Control Delay	40.2	8.2	42.4	24.6	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	8.2	42.4	24.6	28.9
LOS	D	A	D	C	C
Approach Delay	36.7		42.4		26.7
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 33.6	Intersection LOS: C
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	716	88	0	702	349	0	0	0	951	0	781
Future Volume (veh/h)	0	716	88	0	702	349	0	0	0	951	0	781
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	723	0	0	709	353				812	209	663
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1748	544	0	1165	544				935	220	697
Arrive On Green	0.00	0.36	0.00	0.00	0.12	0.12				0.58	0.58	0.58
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	380	1207
Grp Volume(v), veh/h	0	723	0	0	709	353				812	0	872
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1587
Q Serve(g_s), s	0.0	13.3	0.0	0.0	24.7	26.5				51.0	0.0	61.8
Cycle Q Clear(g_c), s	0.0	13.3	0.0	0.0	24.7	26.5				51.0	0.0	61.8
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.76
Lane Grp Cap(c), veh/h	0	1748	544	0	1165	544				935	0	917
V/C Ratio(X)	0.00	0.41	0.00	0.00	0.61	0.65				0.87	0.00	0.95
Avail Cap(c_a), veh/h	0	1748	544	0	1165	544				1100	0	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.2	0.0	0.0	45.0	45.8				21.5	0.0	23.8
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	2.4	5.9				6.0	0.0	14.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.1	0.0	0.0	11.6	12.1				24.1	0.0	30.7
LnGrp Delay(d),s/veh	0.0	29.9	0.0	0.0	47.4	51.7				27.5	0.0	38.6
LnGrp LOS		C			D	D				C		D
Approach Vol, veh/h		723			1062						1684	
Approach Delay, s/veh		29.9			48.8						33.2	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		47.2		72.8		47.2		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		15.3		63.8		28.5		
Green Ext Time (p_c), s		8.3		5.5		1.6		

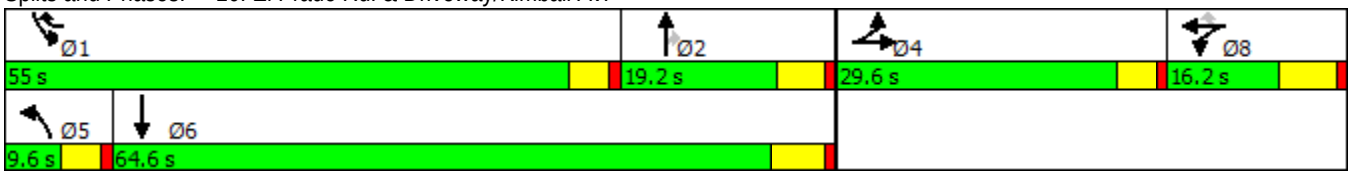
Intersection Summary	
HCM 2010 Ctrl Delay	37.3
HCM 2010 LOS	D

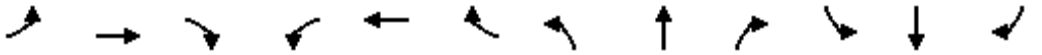
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	35	8	3	833	4	202	24	978	352
Future Volume (vph)	35	8	3	833	4	202	24	978	352
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.17	0.07	0.14	0.74	0.05	0.78	0.07	1.16	0.18
Control Delay	42.7	29.8	48.4	8.7	53.2	63.5	0.4	111.6	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	29.8	48.4	8.7	53.2	63.5	0.4	111.6	10.8
LOS	D	C	D	A	D	E	A	F	B
Approach Delay		38.8	9.9			56.8			84.1
Approach LOS		D	A			E			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.16	
Intersection Signal Delay: 55.0	Intersection LOS: D
Intersection Capacity Utilization 93.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	8	8	23	3	833	4	202	24	978	352	14
Future Volume (veh/h)	35	8	8	23	3	833	4	202	24	978	352	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	37	8	6	24	3	426	4	213	24	1029	371	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	71	53	148	19	895	78	244	207	790	1933	73
Arrive On Green	0.07	0.07	0.07	0.10	0.10	0.10	0.05	0.14	0.14	0.49	0.58	0.58
Sat Flow, veh/h	1619	956	717	1532	191	1530	1619	1800	1530	1619	3361	127
Grp Volume(v), veh/h	37	0	14	27	0	426	4	213	24	1029	188	197
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1723	0	1530	1619	1800	1530	1619	1710	1777
Q Serve(g_s), s	2.2	0.0	0.8	1.5	0.0	10.0	0.2	12.0	1.4	50.4	5.4	5.5
Cycle Q Clear(g_c), s	2.2	0.0	0.8	1.5	0.0	10.0	0.2	12.0	1.4	50.4	5.4	5.5
Prop In Lane	1.00		0.43	0.89		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	125	167	0	895	78	244	207	790	983	1022
V/C Ratio(X)	0.31	0.00	0.11	0.16	0.00	0.48	0.05	0.87	0.12	1.30	0.19	0.19
Avail Cap(c_a), veh/h	392	0	405	167	0	895	78	244	207	790	983	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	44.6	42.8	0.0	12.3	46.9	43.8	39.2	26.4	10.5	10.5
Incr Delay (d2), s/veh	1.4	0.0	0.4	0.4	0.0	0.4	0.1	27.6	0.2	145.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.4	0.7	0.0	7.1	0.1	7.8	0.6	54.3	2.6	2.7
LnGrp Delay(d),s/veh	46.7	0.0	45.0	43.2	0.0	12.7	47.0	71.3	39.5	171.6	10.6	10.6
LnGrp LOS	D		D	D		B	D	E	D	F	B	B
Approach Vol, veh/h		51			453			241			1414	
Approach Delay, s/veh		46.2			14.5			67.8			127.8	
Approach LOS		D			B			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.8		12.3	9.6	65.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	14.0		4.2	2.2	7.5		12.0
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	3.5		0.0

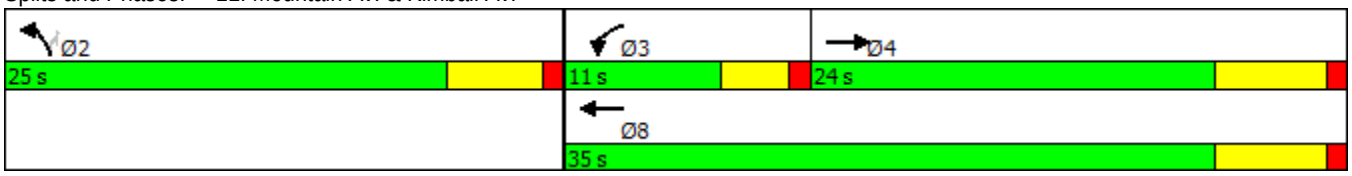
Intersection Summary	
HCM 2010 Ctrl Delay	95.4
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1012	50	709	146	142
Future Volume (vph)	1012	50	709	146	142
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	18.7	7.3	22.3	9.9	9.9
Actuated g/C Ratio	0.43	0.17	0.51	0.23	0.23
v/c Ratio	0.84	0.21	0.45	0.44	0.34
Control Delay	22.9	21.9	8.2	19.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	21.9	8.2	19.7	5.7
LOS	C	C	A	B	A
Approach Delay	22.9		9.1	12.8	
Approach LOS	C		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1012	91	50	709	146	142
Future Volume (veh/h)	1012	91	50	709	146	142
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1112	98	55	779	160	133
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1279	113	127	1962	264	250
Arrive On Green	0.40	0.40	0.08	0.57	0.16	0.16
Sat Flow, veh/h	3271	280	1619	3510	1619	1530
Grp Volume(v), veh/h	597	613	55	779	160	133
Grp Sat Flow(s),veh/h/ln	1710	1751	1619	1710	1619	1530
Q Serve(g_s), s	13.8	13.8	1.4	5.4	3.9	3.4
Cycle Q Clear(g_c), s	13.8	13.8	1.4	5.4	3.9	3.4
Prop In Lane		0.16	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	687	704	127	1962	264	250
V/C Ratio(X)	0.87	0.87	0.43	0.40	0.61	0.53
Avail Cap(c_a), veh/h	717	734	264	2311	743	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	11.8	18.9	5.1	16.7	16.5
Incr Delay (d2), s/veh	10.3	10.2	0.9	0.0	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	8.5	0.6	2.5	1.8	1.5
LnGrp Delay(d),s/veh	22.1	22.0	19.7	5.1	17.5	17.1
LnGrp LOS	C	C	B	A	B	B
Approach Vol, veh/h	1210			834	293	
Approach Delay, s/veh	22.0			6.1	17.3	
Approach LOS	C			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	7.4	23.3				30.6
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		5.9	3.4	15.8				7.4
Green Ext Time (p_c), s		0.2	0.0	1.4				6.1

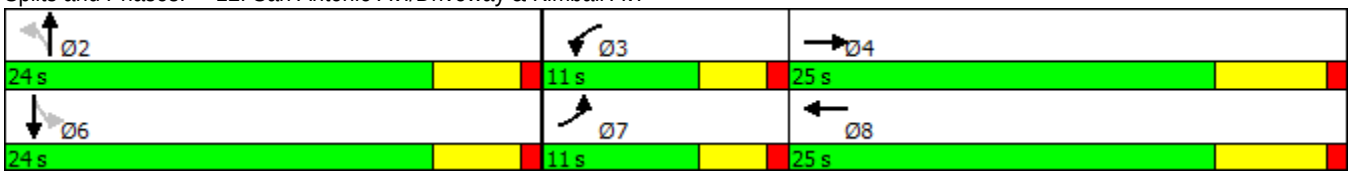
Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

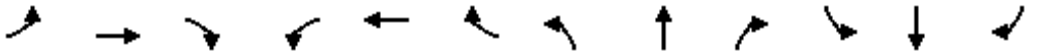
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	25	1110	15	694	64	0	76	0
Future Volume (vph)	25	1110	15	694	64	0	76	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	25.0	11.0	25.0	24.0	24.0	24.0	24.0
Total Split (%)	18.3%	41.7%	18.3%	41.7%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	19.6	7.2	19.6	9.0	9.0	9.0	9.0
Actuated g/C Ratio	0.17	0.47	0.17	0.47	0.22	0.22	0.22	0.22
v/c Ratio	0.09	0.75	0.06	0.44	0.24	0.03	0.29	0.02
Control Delay	19.0	16.5	18.8	10.1	16.2	0.1	17.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	16.5	18.8	10.1	16.2	0.1	17.0	0.0
LOS	B	B	B	B	B	A	B	A
Approach Delay		16.6		10.3		12.6		15.3
Approach LOS		B		B		B		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 41.5
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 14.2 — Intersection LOS: B
Intersection Capacity Utilization 54.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1110	42	15	694	12	64	0	18	76	0	9
Future Volume (veh/h)	25	1110	42	15	694	12	64	0	18	76	0	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	1168	44	16	731	13	67	0	17	80	0	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	1419	53	46	1433	25	411	0	269	403	0	269
Arrive On Green	0.04	0.42	0.42	0.03	0.41	0.41	0.18	0.00	0.18	0.18	0.00	0.18
Sat Flow, veh/h	1619	3361	127	1619	3525	63	1349	0	1530	1339	0	1530
Grp Volume(v), veh/h	26	594	618	16	373	371	67	0	17	80	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1778	1619	1800	1787	1349	0	1530	1339	0	1530
Q Serve(g_s), s	0.6	12.3	12.3	0.4	6.2	6.2	1.7	0.0	0.4	2.1	0.0	0.2
Cycle Q Clear(g_c), s	0.6	12.3	12.3	0.4	6.2	6.2	1.9	0.0	0.4	2.5	0.0	0.2
Prop In Lane	1.00		0.07	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	722	750	46	732	727	411	0	269	403	0	269
V/C Ratio(X)	0.37	0.82	0.82	0.35	0.51	0.51	0.16	0.00	0.06	0.20	0.00	0.03
Avail Cap(c_a), veh/h	284	815	847	284	858	852	820	0	733	810	0	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.5	10.2	10.2	19.0	8.9	8.9	14.4	0.0	13.7	14.7	0.0	13.6
Incr Delay (d2), s/veh	1.2	5.4	5.3	1.6	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	6.7	6.9	0.2	3.0	3.0	0.6	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	19.7	15.6	15.5	20.6	9.1	9.1	14.5	0.0	13.7	14.8	0.0	13.6
LnGrp LOS	B	B	B	C	A	A	B		B	B		B
Approach Vol, veh/h		1238			760			84			89	
Approach Delay, s/veh		15.6			9.3			14.3			14.7	
Approach LOS		B			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.1	22.8		11.9	5.8	22.2
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		3.9	2.4	14.3		4.5	2.6	8.2
Green Ext Time (p_c), s		0.2	0.0	2.5		0.2	0.0	4.2

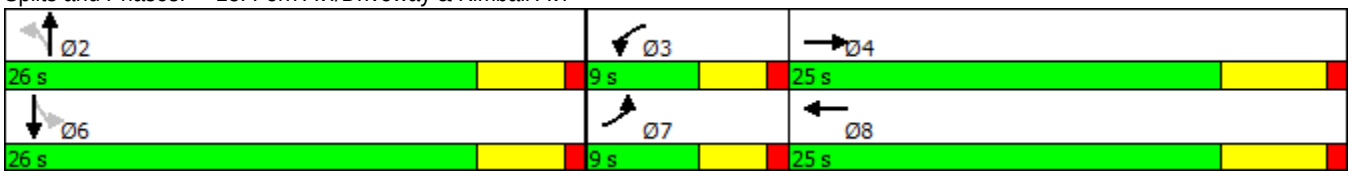
Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1175	11	636	47	1	187	7
Future Volume (vph)	20	1175	11	636	47	1	187	7
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	19.9	5.2	19.9	11.3	11.3	11.3	11.3
Actuated g/C Ratio	0.12	0.46	0.12	0.46	0.26	0.26	0.26	0.26
v/c Ratio	0.12	0.87	0.07	0.47	0.17	0.10	0.66	0.11
Control Delay	22.9	22.4	22.3	11.4	13.7	5.7	25.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	22.4	22.3	11.4	13.7	5.7	25.1	6.5
LOS	C	C	C	B	B	A	C	A
Approach Delay		22.4		11.5		10.0		21.7
Approach LOS		C		B		B		C

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 43.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 18.6 — Intersection LOS: B
Intersection Capacity Utilization 62.1% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1175	21	11	636	11	47	1	38	187	7	34
Future Volume (veh/h)	20	1175	21	11	636	11	47	1	38	187	7	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	23	1335	18	12	723	12	53	1	23	212	8	21
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	45	1490	20	25	1442	24	434	14	320	438	96	251
Arrive On Green	0.03	0.43	0.43	0.02	0.42	0.42	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1619	3454	47	1619	3441	57	1325	64	1475	1331	440	1156
Grp Volume(v), veh/h	23	661	692	12	359	376	53	0	24	212	0	29
Grp Sat Flow(s),veh/h/ln	1619	1710	1791	1619	1710	1788	1325	0	1540	1331	0	1596
Q Serve(g_s), s	0.6	15.5	15.6	0.3	6.7	6.7	1.4	0.0	0.5	6.5	0.0	0.6
Cycle Q Clear(g_c), s	0.6	15.5	15.6	0.3	6.7	6.7	2.1	0.0	0.5	7.1	0.0	0.6
Prop In Lane	1.00		0.03	1.00		0.03	1.00		0.96	1.00		0.72
Lane Grp Cap(c), veh/h	45	738	772	25	716	749	434	0	334	438	0	346
V/C Ratio(X)	0.51	0.90	0.90	0.48	0.50	0.50	0.12	0.00	0.07	0.48	0.00	0.08
Avail Cap(c_a), veh/h	186	760	796	186	760	795	790	0	748	796	0	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	11.4	11.4	21.2	9.3	9.3	14.4	0.0	13.5	16.3	0.0	13.6
Incr Delay (d2), s/veh	3.3	12.6	12.2	5.1	0.2	0.2	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	9.7	10.1	0.2	3.1	3.3	0.5	0.0	0.2	2.4	0.0	0.3
LnGrp Delay(d),s/veh	24.1	24.0	23.6	26.3	9.5	9.5	14.4	0.0	13.6	16.7	0.0	13.6
LnGrp LOS	C	C	C	C	A	A	B		B	B		B
Approach Vol, veh/h		1376			747			77			241	
Approach Delay, s/veh		23.8			9.7			14.2			16.3	
Approach LOS		C			A			B			B	

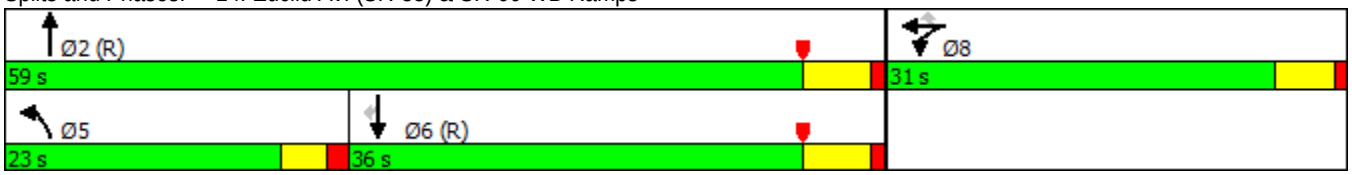
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.3	4.7	24.4		14.3	5.2	23.9
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		4.1	2.3	17.6		9.1	2.6	8.7
Green Ext Time (p_c), s		0.4	0.0	1.2		0.3	0.0	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	629	6	414	524	1053	928	538
Future Volume (vph)	629	6	414	524	1053	928	538
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.7	24.7	24.7	19.8	54.8	30.5	30.5
Actuated g/C Ratio	0.27	0.27	0.27	0.22	0.61	0.34	0.34
v/c Ratio	0.91	0.88	0.75	1.55	0.53	0.84	0.65
Control Delay	59.6	52.5	33.3	278.1	22.8	35.7	6.1
Queue Delay	0.0	0.0	0.0	0.0	2.6	0.0	0.0
Total Delay	59.6	52.5	33.3	278.1	25.4	35.7	6.1
LOS	E	D	C	F	C	D	A
Approach Delay		49.0			109.4	24.8	
Approach LOS		D			F	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.55	
Intersection Signal Delay: 63.6	Intersection LOS: E
Intersection Capacity Utilization 109.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	629	6	414	524	1053	0	0	928	538
Future Volume (veh/h)	0	0	0	629	6	414	524	1053	0	0	928	538
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				752	0	190	552	1108	0	0	977	566
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				832	0	388	333	2142	0	0	1268	549
Arrive On Green				0.26	0.00	0.26	0.41	1.00	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1481
Grp Volume(v), veh/h				752	0	190	552	1108	0	0	977	566
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1481
Q Serve(g_s), s				20.2	0.0	9.6	18.5	0.0	0.0	0.0	22.6	33.4
Cycle Q Clear(g_c), s				20.2	0.0	9.6	18.5	0.0	0.0	0.0	22.6	33.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				832	0	388	333	2142	0	0	1268	549
V/C Ratio(X)				0.90	0.00	0.49	1.66	0.52	0.00	0.00	0.77	1.03
Avail Cap(c_a), veh/h				935	0	436	333	2142	0	0	1268	549
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.11	0.11	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.4	0.0	28.4	26.5	0.0	0.0	0.0	24.9	28.3
Incr Delay (d2), s/veh				10.5	0.0	0.4	297.9	0.1	0.0	0.0	4.6	46.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.2	0.0	4.0	35.7	0.0	0.0	0.0	11.4	20.7
LnGrp Delay(d),s/veh				42.8	0.0	28.8	324.4	0.1	0.0	0.0	29.5	74.9
LnGrp LOS				D		C	F	A			C	F
Approach Vol, veh/h					942			1660			1543	
Approach Delay, s/veh					40.0			108.0			46.1	
Approach LOS					D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.9			23.0	38.9		28.1
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			20.5	35.4		22.2
Green Ext Time (p_c), s		40.2			0.0	0.0		0.9

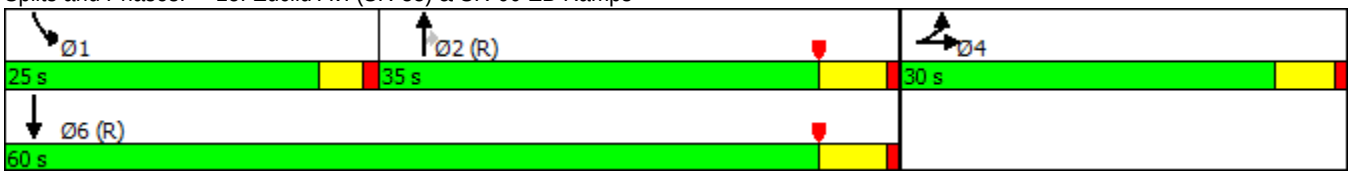
Intersection Summary	
HCM 2010 Ctrl Delay	69.5
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	384	2	1194	746	307	1251
Future Volume (vph)	384	2	1194	746	307	1251
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	25.0	25.0	30.9	30.9	19.6	54.5
Actuated g/C Ratio	0.28	0.28	0.34	0.34	0.22	0.61
v/c Ratio	0.83	1.32	1.04	0.80	0.89	0.62
Control Delay	48.8	186.5	67.3	11.8	52.2	5.1
Queue Delay	19.1	1.5	0.0	0.0	0.0	0.9
Total Delay	68.0	188.0	67.3	11.8	52.2	6.0
LOS	E	F	E	B	D	A
Approach Delay		143.4	46.0			15.1
Approach LOS		F	D			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.32	
Intersection Signal Delay: 55.6	Intersection LOS: E
Intersection Capacity Utilization 109.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	384	2	545	0	0	0	0	1194	746	307	1251	0
Future Volume (veh/h)	384	2	545	0	0	0	0	1194	746	307	1251	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	392	2	479				0	1218	761	313	1277	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	450	2	423				0	1198	520	341	2071	0
Arrive On Green	0.28	0.28	0.28				0.00	0.35	0.35	0.28	0.81	0.00
Sat Flow, veh/h	1619	6	1525				0	3510	1484	1619	3510	0
Grp Volume(v), veh/h	392	0	481				0	1218	761	313	1277	0
Grp Sat Flow(s),veh/h/ln	1619	0	1531				0	1710	1484	1619	1710	0
Q Serve(g_s), s	20.8	0.0	25.0				0.0	31.5	31.5	16.9	13.0	0.0
Cycle Q Clear(g_c), s	20.8	0.0	25.0				0.0	31.5	31.5	16.9	13.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	450	0	425				0	1198	520	341	2071	0
V/C Ratio(X)	0.87	0.00	1.13				0.00	1.02	1.46	0.92	0.62	0.00
Avail Cap(c_a), veh/h	450	0	425				0	1198	520	378	2071	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.64	0.64	0.39	0.39	0.00
Uniform Delay (d), s/veh	31.0	0.0	32.5				0.0	29.2	29.2	31.6	4.7	0.0
Incr Delay (d2), s/veh	16.2	0.0	84.5				0.0	25.0	215.4	11.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.0	20.5				0.0	19.0	44.0	8.6	6.0	0.0
LnGrp Delay(d),s/veh	47.2	0.0	117.0				0.0	54.2	244.7	43.4	5.3	0.0
LnGrp LOS	D		F					F	F	D	A	
Approach Vol, veh/h		873						1979			1590	
Approach Delay, s/veh		85.6						127.5			12.8	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.0	37.0		30.0		60.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	18.9	33.5		27.0		15.0		
Green Ext Time (p_c), s	0.1	0.0		0.0		36.5		

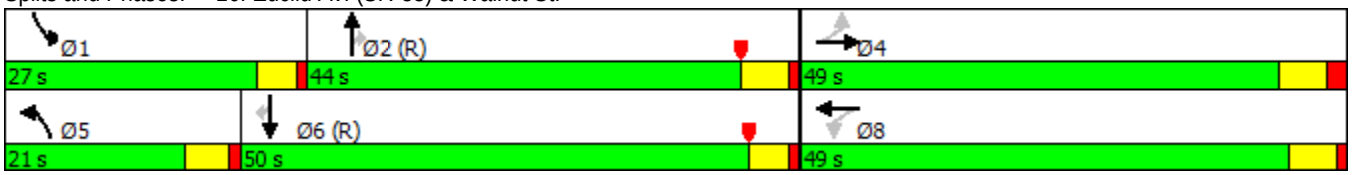
Intersection Summary	
HCM 2010 Ctrl Delay	78.2
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	123	320	98	278	130	1612	65	325	1326	137
Future Volume (vph)	123	320	98	278	130	1612	65	325	1326	137
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	49.0	49.0	49.0	49.0	21.0	44.0	44.0	27.0	50.0	50.0
Total Split (%)	40.8%	40.8%	40.8%	40.8%	17.5%	36.7%	36.7%	22.5%	41.7%	41.7%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.8	26.8	27.8	27.8	14.9	59.0	59.0	18.1	62.6	62.6
Actuated g/C Ratio	0.22	0.22	0.23	0.23	0.12	0.49	0.49	0.15	0.52	0.52
v/c Ratio	0.93	0.62	0.81	0.52	0.68	0.70	0.09	0.76	0.54	0.17
Control Delay	102.7	38.4	82.5	34.7	76.3	8.1	0.3	60.2	22.4	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	38.4	82.5	34.7	76.3	8.1	0.3	60.2	22.4	4.2
LOS	F	D	F	C	E	A	A	E	C	A
Approach Delay		51.9		44.1		12.7			27.9	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 26.8	Intersection LOS: C
Intersection Capacity Utilization 84.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	320	144	98	278	122	130	1612	65	325	1326	137
Future Volume (veh/h)	123	320	144	98	278	122	130	1612	65	325	1326	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	128	333	119	102	290	106	135	1679	45	339	1381	84
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	236	703	246	213	700	250	159	2208	678	391	2360	733
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.13	0.60	0.60	0.13	0.48	0.48
Sat Flow, veh/h	944	2473	867	900	2463	880	1619	4914	1508	2956	4914	1526
Grp Volume(v), veh/h	128	228	224	102	199	197	135	1679	45	339	1381	84
Grp Sat Flow(s),veh/h/ln	944	1710	1631	900	1710	1634	1619	1638	1508	1478	1638	1526
Q Serve(g_s), s	15.3	13.2	13.7	12.7	11.3	11.8	9.8	30.2	1.5	13.5	24.4	3.6
Cycle Q Clear(g_c), s	27.1	13.2	13.7	26.4	11.3	11.8	9.8	30.2	1.5	13.5	24.4	3.6
Prop In Lane	1.00		0.53	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	236	486	463	213	486	464	159	2208	678	391	2360	733
V/C Ratio(X)	0.54	0.47	0.48	0.48	0.41	0.42	0.85	0.76	0.07	0.87	0.59	0.11
Avail Cap(c_a), veh/h	303	608	580	285	623	595	217	2208	678	554	2360	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.75	0.75	0.75
Uniform Delay (d), s/veh	46.0	35.5	35.6	46.6	34.8	35.0	51.3	19.4	13.6	51.0	22.5	17.1
Incr Delay (d2), s/veh	1.9	0.7	0.8	1.7	0.6	0.6	2.3	0.2	0.0	5.8	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	6.4	6.3	3.3	5.4	5.4	4.5	13.5	0.6	5.8	11.2	1.6
LnGrp Delay(d),s/veh	47.9	36.2	36.4	48.2	35.4	35.6	53.6	19.6	13.6	56.9	23.3	17.4
LnGrp LOS	D	D	D	D	D	D	D	B	B	E	C	B
Approach Vol, veh/h		580			498			1859			1804	
Approach Delay, s/veh		38.9			38.1			21.9			29.4	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.4	59.2		40.4	16.7	62.9		40.4
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	22.5	38.7		42.7	16.1	* 46		* 44
Max Q Clear Time (g_c+I1), s	15.5	32.2		29.1	11.8	26.4		28.4
Green Ext Time (p_c), s	0.4	6.0		5.0	0.1	16.2		5.3

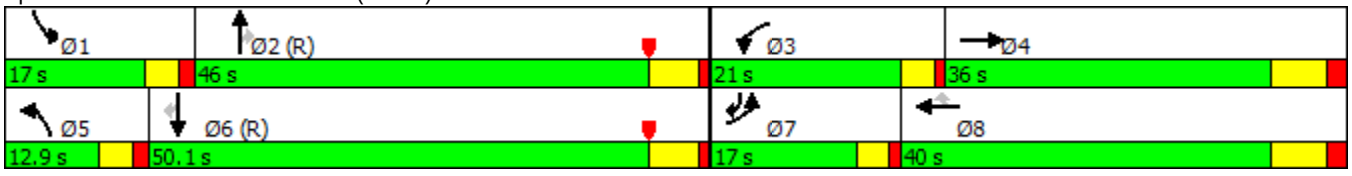
Intersection Summary	
HCM 2010 Ctrl Delay	28.5
HCM 2010 LOS	C

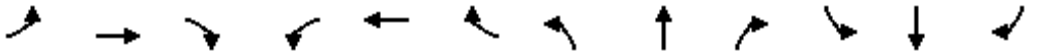
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	149	383	174	344	55	107	1493	273	130	1177	165
Future Volume (vph)	149	383	174	344	55	107	1493	273	130	1177	165
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.9	24.0	16.0	27.1	27.1	12.4	45.0	45.0	14.0	46.6	61.0
Actuated g/C Ratio	0.11	0.20	0.13	0.23	0.23	0.10	0.38	0.38	0.12	0.39	0.51
v/c Ratio	0.92	0.75	0.87	0.48	0.14	0.69	1.25	0.43	0.75	0.95	0.21
Control Delay	104.3	50.0	86.5	41.7	2.1	55.4	158.6	26.8	59.9	53.8	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.3	50.0	86.5	41.7	2.1	55.4	158.6	26.8	59.9	53.8	12.3
LOS	F	D	F	D	A	E	F	C	E	D	B
Approach Delay		63.0		51.5			133.5			49.7	
Approach LOS		E		D			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.25	
Intersection Signal Delay: 86.3	Intersection LOS: F
Intersection Capacity Utilization 94.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	383	90	174	344	55	107	1493	273	130	1177	165
Future Volume (veh/h)	149	383	90	174	344	55	107	1493	273	130	1177	165
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	160	412	63	187	370	59	115	1605	163	140	1266	79
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	565	86	211	724	319	113	1379	617	165	1487	821
Arrive On Green	0.11	0.19	0.19	0.13	0.21	0.21	0.02	0.13	0.13	0.03	0.14	0.14
Sat Flow, veh/h	1619	2978	452	1619	3420	1507	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	160	235	240	187	370	59	115	1605	163	140	1266	79
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	1507	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	11.7	15.5	15.7	13.6	11.5	3.9	8.4	48.4	11.5	10.3	43.3	4.4
Cycle Q Clear(g_c), s	11.7	15.5	15.7	13.6	11.5	3.9	8.4	48.4	11.5	10.3	43.3	4.4
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	325	327	211	724	319	113	1379	617	165	1487	821
V/C Ratio(X)	0.91	0.73	0.73	0.89	0.51	0.18	1.01	1.16	0.26	0.85	0.85	0.10
Avail Cap(c_a), veh/h	175	413	416	229	941	414	113	1379	617	169	1487	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.49	0.49	0.49	0.82	0.82	0.82
Uniform Delay (d), s/veh	52.9	45.7	45.8	51.3	41.8	38.8	58.6	52.0	36.0	57.1	47.6	20.5
Incr Delay (d2), s/veh	42.9	5.7	6.0	28.3	0.8	0.4	62.9	78.2	0.5	26.5	5.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	7.8	8.0	7.7	5.5	1.6	5.7	37.9	5.0	5.9	21.7	1.9
LnGrp Delay(d),s/veh	95.8	51.3	51.7	79.6	42.6	39.2	121.6	130.2	36.5	83.6	52.8	20.7
LnGrp LOS	F	D	D	E	D	D	F	F	D	F	D	C
Approach Vol, veh/h		635			616			1883			1485	
Approach Delay, s/veh		62.7			53.5			121.6			54.0	
Approach LOS		E			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	53.9	19.6	29.8	12.9	57.7	17.0	32.4
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	12.3	50.4	15.6	17.7	10.4	45.3	13.7	13.5
Green Ext Time (p_c), s	0.0	0.0	0.0	5.1	0.0	0.0	0.0	6.9

Intersection Summary	
HCM 2010 Ctrl Delay	82.7
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	69	173	49	72	96	61	1823	209	15	1316	62
Future Volume (vph)	69	173	49	72	96	61	1823	209	15	1316	62
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	9.0	69.8	69.8	9.2	70.0	70.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	34.2%	7.5%	58.2%	58.2%	7.7%	58.3%	58.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.8	22.8	22.8		22.8	8.9	80.2	80.2	5.7	71.8	71.8
Actuated g/C Ratio	0.19	0.19	0.19		0.19	0.07	0.67	0.67	0.05	0.60	0.60
v/c Ratio	0.41	0.52	0.15		0.85	0.53	0.82	0.21	0.20	0.66	0.07
Control Delay	47.3	47.8	8.2		75.3	56.7	24.5	6.9	79.2	4.7	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	47.8	8.2		75.3	56.7	24.5	6.9	79.2	4.7	0.1
LOS	D	D	A		E	E	C	A	E	A	A
Approach Delay		40.9			75.3		23.7			5.3	
Approach LOS		D			E		C			A	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 21.0 — Intersection LOS: C
Intersection Capacity Utilization 93.9% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	173	49	72	96	23	61	1823	209	15	1316	62
Future Volume (veh/h)	69	173	49	72	96	23	61	1823	209	15	1316	62
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	71	178	32	74	99	20	63	1879	159	15	1357	35
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	222	381	324	113	138	24	74	2170	971	27	2069	906
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.09	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1221	1800	1530	336	650	114	1619	3420	1530	1619	3420	1498
Grp Volume(v), veh/h	71	178	32	193	0	0	63	1879	159	15	1357	35
Grp Sat Flow(s),veh/h/ln	1221	1800	1530	1100	0	0	1619	1710	1530	1619	1710	1498
Q Serve(g_s), s	0.0	10.4	2.0	11.3	0.0	0.0	4.6	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.9	10.4	2.0	21.7	0.0	0.0	4.6	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	222	381	324	274	0	0	74	2170	971	27	2069	906
V/C Ratio(X)	0.32	0.47	0.10	0.70	0.00	0.00	0.85	0.87	0.16	0.57	0.66	0.04
Avail Cap(c_a), veh/h	310	510	433	380	0	0	74	2170	971	77	2069	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.22	0.22	0.22
Uniform Delay (d), s/veh	41.6	41.4	38.1	47.3	0.0	0.0	54.1	0.0	0.0	57.6	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.9	0.1	3.5	0.0	0.0	7.9	0.5	0.0	1.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.2	0.9	6.5	0.0	0.0	2.2	0.1	0.0	0.5	0.1	0.0
LnGrp Delay(d),s/veh	42.4	42.3	38.2	50.8	0.0	0.0	62.0	0.5	0.0	59.2	0.4	0.0
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		281			193			2101			1407	
Approach Delay, s/veh		41.8			50.8			2.3			1.0	
Approach LOS		D			D			A			A	

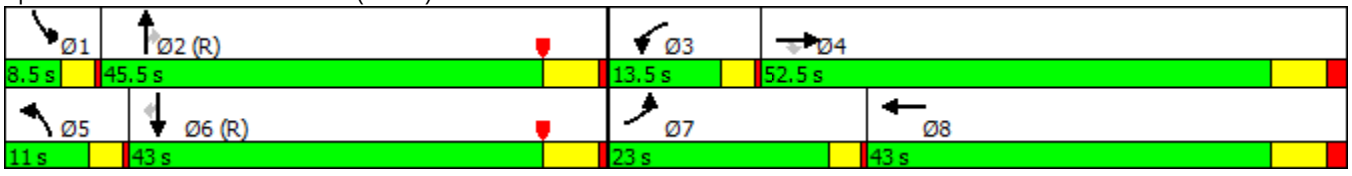
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	82.1		32.4	9.0	78.6		32.4
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	63.8		34.0	5.5	64.0		34.0
Max Q Clear Time (g_c+I1), s	3.1	2.0		12.9	6.6	2.0		23.7
Green Ext Time (p_c), s	0.0	48.4		2.3	0.0	48.6		1.7

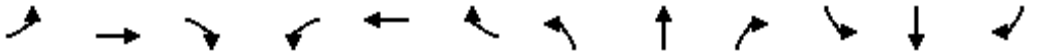
Intersection Summary	
HCM 2010 Ctrl Delay	7.0
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	300	225	186	27	49	118	1794	40	22	1305	132
Future Volume (vph)	300	225	186	27	49	118	1794	40	22	1305	132
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	27.1	27.1	10.0	14.6	15.9	66.0	66.0	5.7	52.3	52.3
Actuated g/C Ratio	0.16	0.23	0.23	0.08	0.12	0.13	0.55	0.55	0.05	0.44	0.44
v/c Ratio	1.18	0.57	0.39	0.21	0.30	0.57	0.98	0.05	0.30	0.90	0.19
Control Delay	157.0	45.7	6.5	55.4	38.2	44.1	38.6	2.5	73.5	32.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	157.0	45.7	6.5	55.4	38.2	44.1	38.6	2.5	73.5	32.6	5.2
LOS	F	D	A	E	D	D	D	A	E	C	A
Approach Delay		82.3			43.3		38.2			30.8	
Approach LOS		F			D		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 43.2	Intersection LOS: D
Intersection Capacity Utilization 95.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	225	186	27	49	15	118	1794	40	22	1305	132
Future Volume (veh/h)	300	225	186	27	49	15	118	1794	40	22	1305	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	309	232	116	28	51	10	122	1849	32	23	1345	83
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	315	267	82	92	18	101	2003	896	36	1866	816
Arrive On Green	0.16	0.17	0.17	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1463	287	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	309	232	116	28	0	61	122	1849	32	23	1345	83
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1749	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	14.7	8.1	2.0	0.0	4.1	7.5	63.7	2.0	1.7	44.5	5.6
Cycle Q Clear(g_c), s	19.5	14.7	8.1	2.0	0.0	4.1	7.5	63.7	2.0	1.7	44.5	5.6
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	315	267	82	0	110	101	2003	896	36	1866	816
V/C Ratio(X)	1.17	0.74	0.43	0.34	0.00	0.55	1.21	0.92	0.04	0.64	0.72	0.10
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	2003	896	67	1866	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.72	0.72	0.72
Uniform Delay (d), s/veh	50.3	46.9	44.2	55.0	0.0	54.6	58.8	45.7	20.9	59.1	40.6	24.6
Incr Delay (d2), s/veh	111.1	2.5	0.8	0.9	0.0	3.2	101.1	0.9	0.0	4.9	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.8	7.5	3.5	0.9	0.0	2.1	6.2	30.5	0.9	0.8	21.5	2.3
LnGrp Delay(d),s/veh	161.3	49.4	45.0	56.0	0.0	57.8	159.9	46.7	20.9	64.0	42.4	24.8
LnGrp LOS	F	D	D	E		E	F	D	C	E	D	C
Approach Vol, veh/h		657			89			2003			1451	
Approach Delay, s/veh		101.3			57.2			53.2			41.7	
Approach LOS		F			E			D			D	

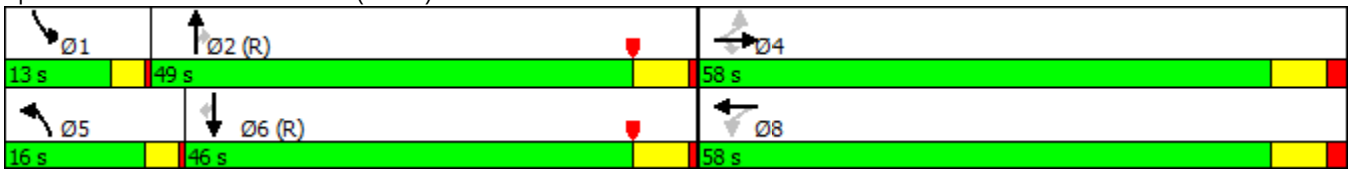
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	76.3	9.6	28.0	11.0	71.5	23.0	14.5
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.7	65.7	4.0	16.7	9.5	46.5	21.5	6.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	56.8
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	343	471	278	28	140	165	1544	76	68	1275	169
Future Volume (vph)	343	471	278	28	140	165	1544	76	68	1275	169
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.0	44.0	44.0	44.0	44.0	15.5	52.9	52.9	8.3	44.0	44.0
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.13	0.44	0.44	0.07	0.37	0.37
v/c Ratio	0.89	0.73	0.41	0.18	0.27	0.81	1.05	0.11	0.62	1.04	0.28
Control Delay	59.9	39.0	8.4	25.9	24.5	58.5	65.8	13.4	88.1	55.2	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	39.0	8.4	25.9	24.5	58.5	65.8	13.4	88.1	55.2	4.7
LOS	E	D	A	C	C	E	E	B	F	E	A
Approach Delay		37.8			24.7		62.9			51.0	
Approach LOS		D			C		E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 51.3	Intersection LOS: D
Intersection Capacity Utilization 100.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	343	471	278	28	140	30	165	1544	76	68	1275	169
Future Volume (veh/h)	343	471	278	28	140	30	165	1544	76	68	1275	169
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	350	481	192	29	143	26	168	1576	58	69	1301	145
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	446	712	597	189	587	107	169	1417	634	85	1240	555
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.03	0.14	0.14	0.11	0.73	0.73
Sat Flow, veh/h	1167	1800	1509	734	1483	270	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	350	481	192	29	0	169	168	1576	58	69	1301	145
Grp Sat Flow(s),veh/h/ln	1167	1800	1509	734	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	34.4	26.4	10.6	4.1	0.0	7.7	12.5	49.7	4.0	5.0	43.5	3.9
Cycle Q Clear(g_c), s	42.1	26.4	10.6	30.5	0.0	7.7	12.5	49.7	4.0	5.0	43.5	3.9
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	446	712	597	189	0	693	169	1417	634	85	1240	555
V/C Ratio(X)	0.78	0.68	0.32	0.15	0.00	0.24	1.00	1.11	0.09	0.81	1.05	0.26
Avail Cap(c_a), veh/h	481	765	641	210	0	745	169	1417	634	128	1240	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.68	0.68	0.68	0.45	0.45	0.45
Uniform Delay (d), s/veh	38.3	29.9	25.1	42.5	0.0	24.2	57.9	51.8	32.1	53.1	16.5	11.0
Incr Delay (d2), s/veh	7.8	2.2	0.3	0.4	0.0	0.2	55.8	58.1	0.2	5.8	31.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	13.5	4.5	0.8	0.0	3.8	8.2	35.0	1.7	2.4	25.1	1.7
LnGrp Delay(d),s/veh	46.1	32.1	25.4	42.9	0.0	24.4	113.7	109.9	32.3	58.9	48.3	11.6
LnGrp LOS	D	C	C	D		C	F	F	C	E	F	B
Approach Vol, veh/h		1023			198			1802			1515	
Approach Delay, s/veh		35.6			27.1			107.7			45.3	
Approach LOS		D			C			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	55.7		54.5	16.0	49.5		54.5
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	7.0	51.7		44.1	14.5	45.5		32.5
Green Ext Time (p_c), s	0.0	0.0		3.4	0.0	0.0		5.8

Intersection Summary	
HCM 2010 Ctrl Delay	67.1
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	49	28	206	7	12	139	1669	12	10	1554	50
Future Volume (vph)	49	28	206	7	12	139	1669	12	10	1554	50
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.6	15.6	15.6	15.6	15.6	15.4	92.2	92.2	5.5	74.9	74.9
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.05	0.62	0.62
v/c Ratio	0.32	0.13	0.64	0.05	0.11	0.73	0.69	0.01	0.15	0.79	0.06
Control Delay	47.5	41.1	19.3	37.1	25.5	58.7	9.5	0.0	70.9	11.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	41.1	19.3	37.1	25.5	58.7	9.5	0.0	70.9	11.9	0.1
LOS	D	D	B	D	C	E	A	A	E	B	A
Approach Delay		26.3			28.4		13.2			11.9	
Approach LOS		C			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 75.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	28	206	7	12	10	139	1669	12	10	1554	50
Future Volume (veh/h)	49	28	206	7	12	10	139	1669	12	10	1554	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	53	30	119	8	13	9	151	1814	12	11	1689	54
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	174	176	150	158	97	67	174	2643	1182	21	2318	1014
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.77	0.77	0.03	1.00	1.00
Sat Flow, veh/h	1333	1800	1530	1188	992	687	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	53	30	119	8	0	22	151	1814	12	11	1689	54
Grp Sat Flow(s),veh/h/ln	1333	1800	1530	1188	0	1679	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.5	1.8	9.1	0.7	0.0	1.4	11.0	30.8	0.2	0.8	0.0	0.0
Cycle Q Clear(g_c), s	6.0	1.8	9.1	2.6	0.0	1.4	11.0	30.8	0.2	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	176	150	158	0	164	174	2643	1182	21	2318	1014
V/C Ratio(X)	0.30	0.17	0.80	0.05	0.00	0.13	0.87	0.69	0.01	0.53	0.73	0.05
Avail Cap(c_a), veh/h	511	630	535	458	0	588	175	2643	1182	67	2318	1014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.29	0.29	0.29
Uniform Delay (d), s/veh	52.2	49.7	53.0	50.9	0.0	49.5	52.7	6.6	3.1	58.1	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.3	7.0	0.1	0.0	0.3	33.0	1.5	0.0	4.4	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.9	4.2	0.2	0.0	0.7	6.5	14.9	0.1	0.4	0.2	0.0
LnGrp Delay(d),s/veh	52.9	50.0	59.9	51.0	0.0	49.8	85.7	8.1	3.1	62.6	0.6	0.0
LnGrp LOS	D	D	E	D		D	F	A	A	E	A	A
Approach Vol, veh/h		202			30			1977			1754	
Approach Delay, s/veh		56.6			50.1			14.0			1.0	
Approach LOS		E			D			B			A	

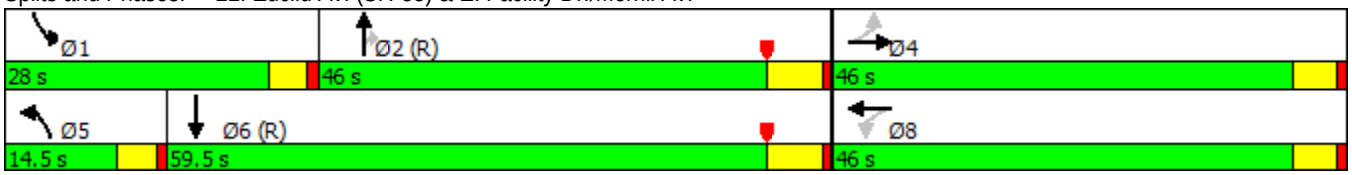
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	98.4		16.5	16.4	87.0		16.5
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.8	32.8		11.1	13.0	2.0		4.6
Green Ext Time (p_c), s	0.0	24.0		0.6	0.0	42.1		0.6

Intersection Summary		
HCM 2010 Ctrl Delay		10.7
HCM 2010 LOS		B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	21	179	0	2	1404	343	682	1067
Future Volume (vph)	5	21	179	0	2	1404	343	682	1067
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	10.0	40.0	40.0	23.5	65.1
Actuated g/C Ratio		0.34		0.34	0.08	0.33	0.33	0.20	0.54
v/c Ratio		0.07		1.19	0.01	1.32	0.65	2.32	0.62
Control Delay		20.8		132.9	77.0	172.7	12.7	620.8	26.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.8		132.9	77.0	172.7	12.7	620.8	26.2
LOS		C		F	E	F	B	F	C
Approach Delay		20.8		132.9		141.2			257.9
Approach LOS		C		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.32	
Intersection Signal Delay: 187.9	Intersection LOS: F
Intersection Capacity Utilization 142.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	11	179	0	453	2	1404	343	682	1067	1
Future Volume (veh/h)	5	21	11	179	0	453	2	1404	343	682	1067	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	23	4	192	0	459	2	1510	340	733	1147	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	88	379	62	188	2	361	9	1140	499	317	1837	2
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.33	0.33	0.20	0.52	0.52
Sat Flow, veh/h	156	1109	181	435	7	1057	1619	3420	1496	1619	3506	3
Grp Volume(v), veh/h	32	0	0	651	0	0	2	1510	340	733	559	589
Grp Sat Flow(s),veh/h/ln	1445	0	0	1499	0	0	1619	1710	1496	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	39.5	0.0	0.0	0.1	40.0	23.5	23.5	27.8	27.8
Cycle Q Clear(g_c), s	1.5	0.0	0.0	41.0	0.0	0.0	0.1	40.0	23.5	23.5	27.8	27.8
Prop In Lane	0.16		0.12	0.29		0.71	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	529	0	0	551	0	0	9	1140	499	317	896	943
V/C Ratio(X)	0.06	0.00	0.00	1.18	0.00	0.00	0.23	1.32	0.68	2.31	0.62	0.62
Avail Cap(c_a), veh/h	529	0	0	551	0	0	135	1140	499	317	896	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	40.9	0.0	0.0	59.4	40.0	34.5	48.3	20.2	20.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	99.3	0.0	0.0	0.4	146.6	0.7	600.2	3.3	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	33.4	0.0	0.0	0.1	42.1	9.8	63.3	13.9	14.6
LnGrp Delay(d),s/veh	26.5	0.0	0.0	140.1	0.0	0.0	59.9	186.6	35.2	648.4	23.5	23.3
LnGrp LOS	C			F			E	F	D	F	C	C
Approach Vol, veh/h		32			651			1852			1881	
Approach Delay, s/veh		26.5			140.1			158.7			267.0	
Approach LOS		C			F			F			F	

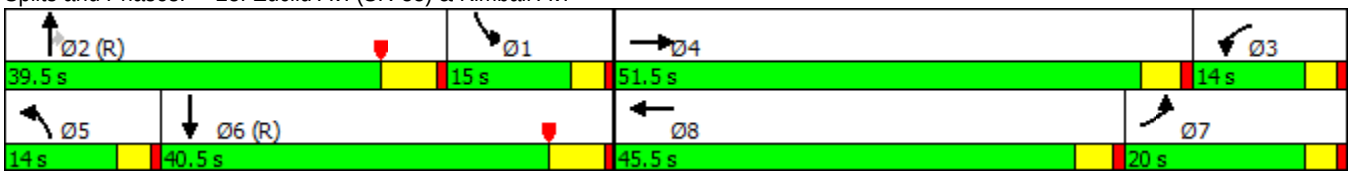
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.0	46.0		46.0	5.1	68.9		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	25.5	42.0		3.5	2.1	29.8		43.0
Green Ext Time (p_c), s	0.0	0.0		3.0	0.0	19.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	201.1	
HCM 2010 LOS	F	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	619	785	206	335	124	800	154	242	868
Future Volume (vph)	619	785	206	335	124	800	154	242	868
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	32.2	39.1	17.9	24.8	10.0	32.5	32.5	12.0	34.5
Actuated g/C Ratio	0.27	0.33	0.15	0.21	0.08	0.27	0.27	0.10	0.29
v/c Ratio	1.49	0.82	0.90	0.79	0.96	0.90	0.30	1.57	1.15
Control Delay	265.5	42.9	87.7	37.8	97.3	45.5	13.1	309.6	107.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	265.5	42.9	87.7	37.8	97.3	45.5	13.1	309.6	107.6
LOS	F	D	F	D	F	D	B	F	F
Approach Delay		135.7		50.4		46.8			145.0
Approach LOS		F		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.57	
Intersection Signal Delay: 103.0	Intersection LOS: F
Intersection Capacity Utilization 113.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	619	785	81	206	335	276	124	800	154	242	868	198
Future Volume (veh/h)	619	785	81	206	335	276	124	800	154	242	868	198
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	645	818	80	215	349	254	129	833	145	252	904	188
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	277	947	93	135	406	290	135	921	412	284	1064	221
Arrive On Green	0.17	0.30	0.30	0.08	0.21	0.21	0.03	0.09	0.09	0.18	0.38	0.38
Sat Flow, veh/h	1619	3148	308	1619	1906	1363	1619	3420	1530	1619	2813	585
Grp Volume(v), veh/h	645	444	454	215	312	291	129	833	145	252	549	543
Grp Sat Flow(s),veh/h/ln	1619	1710	1746	1619	1710	1559	1619	1710	1530	1619	1710	1688
Q Serve(g_s), s	20.6	29.4	29.5	10.0	21.1	21.6	9.5	29.0	10.7	18.2	35.3	35.4
Cycle Q Clear(g_c), s	20.6	29.4	29.5	10.0	21.1	21.6	9.5	29.0	10.7	18.2	35.3	35.4
Prop In Lane	1.00		0.18	1.00		0.87	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	277	515	525	135	364	332	135	921	412	284	647	638
V/C Ratio(X)	2.32	0.86	0.86	1.59	0.86	0.88	0.96	0.90	0.35	0.89	0.85	0.85
Avail Cap(c_a), veh/h	277	670	684	135	584	533	135	955	427	284	647	638
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.43	0.43	0.43	1.00	1.00	1.00	0.47	0.47	0.47	0.75	0.75	0.75
Uniform Delay (d), s/veh	49.7	39.6	39.6	55.0	45.5	45.7	58.1	53.1	44.8	48.3	34.2	34.2
Incr Delay (d2), s/veh	600.8	4.2	4.1	299.1	4.1	5.7	40.9	7.5	1.1	20.7	10.2	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	55.5	14.5	14.8	15.7	10.4	9.8	5.8	14.7	4.7	9.8	18.5	18.3
LnGrp Delay(d),s/veh	650.5	43.8	43.7	354.1	49.5	51.3	99.1	60.6	45.9	69.0	44.4	44.6
LnGrp LOS	F	D	D	F	D	D	F	E	D	E	D	D
Approach Vol, veh/h		1543			818			1107			1344	
Approach Delay, s/veh		297.4			130.2			63.2			49.1	
Approach LOS		F			F			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.1	38.3	14.0	40.6	14.0	51.4	24.6	30.0
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	20.2	31.0	12.0	31.5	11.5	37.4	22.6	23.6
Green Ext Time (p_c), s	0.0	1.3	0.0	4.7	0.0	0.0	0.0	1.9

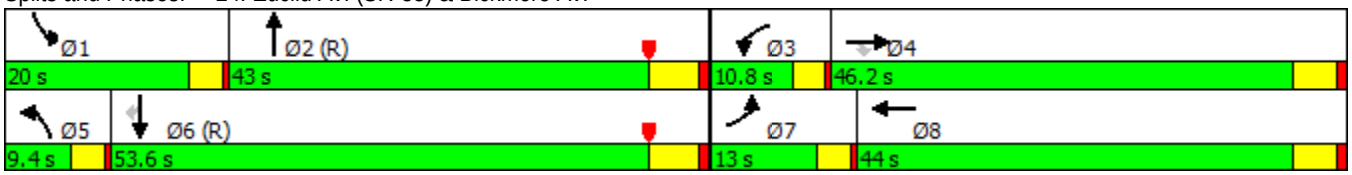
Intersection Summary	
HCM 2010 Ctrl Delay	145.7
HCM 2010 LOS	F

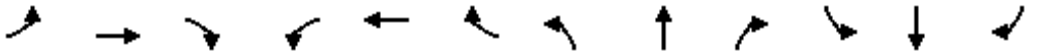
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	115	118	118	89	42	47	853	214	827	77
Future Volume (vph)	115	118	118	89	42	47	853	214	827	77
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.5	17.7	17.7	7.3	15.5	7.4	53.0	24.4	71.8	71.8
Actuated g/C Ratio	0.08	0.15	0.15	0.06	0.13	0.06	0.44	0.20	0.60	0.60
v/c Ratio	1.01	0.49	0.39	1.01	0.56	0.53	0.80	0.73	0.45	0.09
Control Delay	137.2	50.6	9.0	149.9	21.6	80.9	14.0	58.3	5.1	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.2	50.6	9.0	149.9	21.6	80.9	14.0	58.3	5.1	0.8
LOS	F	D	A	F	C	F	B	E	A	A
Approach Delay		65.1			68.0		16.8		15.0	
Approach LOS		E			E		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 26.6	Intersection LOS: C
Intersection Capacity Utilization 77.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	118	118	89	42	115	47	853	203	214	827	77
Future Volume (veh/h)	115	118	118	89	42	115	47	853	203	214	827	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	128	131	112	99	47	116	52	948	216	238	919	86
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	128	259	220	98	58	143	65	1411	321	223	2084	913
Arrive On Green	0.08	0.14	0.14	0.06	0.13	0.13	0.05	0.68	0.68	0.28	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	461	1138	1619	2757	627	1619	3420	1498
Grp Volume(v), veh/h	128	131	112	99	0	163	52	587	577	238	919	86
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1599	1619	1710	1674	1619	1710	1498
Q Serve(g_s), s	9.5	8.1	8.1	7.3	0.0	11.9	3.8	24.2	24.4	16.5	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.1	8.1	7.3	0.0	11.9	3.8	24.2	24.4	16.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.71	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	128	259	220	98	0	201	65	875	857	223	2084	913
V/C Ratio(X)	1.00	0.51	0.51	1.01	0.00	0.81	0.81	0.67	0.67	1.07	0.44	0.09
Avail Cap(c_a), veh/h	128	618	525	98	0	520	80	875	857	223	2084	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.2	47.4	47.4	56.3	0.0	51.1	56.4	13.2	13.2	43.5	0.0	0.0
Incr Delay (d2), s/veh	79.0	0.6	0.7	92.1	0.0	3.0	3.6	0.4	0.4	39.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	4.0	3.5	5.8	0.0	5.4	1.8	11.4	11.2	9.8	0.0	0.0
LnGrp Delay(d),s/veh	134.3	48.0	48.1	148.4	0.0	54.0	60.0	13.6	13.6	83.4	0.1	0.0
LnGrp LOS	F	D	D	F		D	E	B	B	F	A	A
Approach Vol, veh/h		371			262			1216			1243	
Approach Delay, s/veh		77.8			89.7			15.6			16.0	
Approach LOS		E			F			B			B	

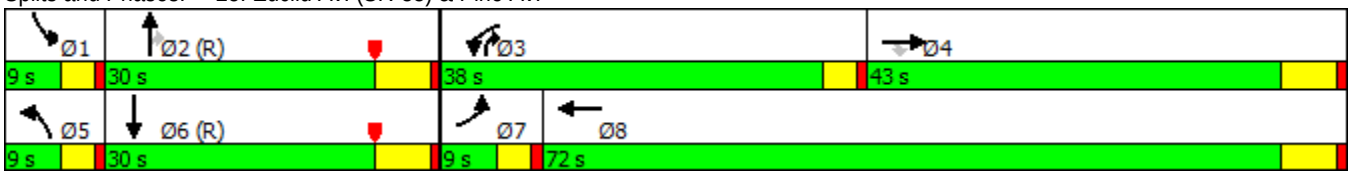
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	66.9	10.8	22.3	8.3	78.6	13.0	20.1
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	18.5	26.4	9.3	10.1	5.8	2.0	11.5	13.9
Green Ext Time (p_c), s	0.0	6.3	0.0	1.2	0.0	10.7	0.0	1.2

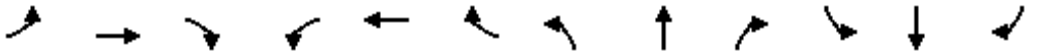
Intersection Summary	
HCM 2010 Ctrl Delay	29.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	339	29	475	77	34	978	1074	104	880
Future Volume (vph)	15	339	29	475	77	34	978	1074	104	880
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	29.2	29.2	34.0	63.6	6.3	24.0	64.0	12.8	34.3
Actuated g/C Ratio	0.04	0.24	0.24	0.28	0.53	0.05	0.20	0.53	0.11	0.29
v/c Ratio	0.22	0.80	0.06	0.59	0.15	0.41	1.47	1.20	0.62	0.95
Control Delay	63.7	56.0	0.2	40.4	9.1	67.3	247.7	113.2	53.6	54.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	56.0	0.2	40.4	9.1	67.3	247.7	113.2	53.6	54.7
LOS	E	E	A	D	A	E	F	F	D	D
Approach Delay		52.0			33.4		175.5			54.5
Approach LOS		D			C		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.47	
Intersection Signal Delay: 113.0	Intersection LOS: F
Intersection Capacity Utilization 107.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	339	29	475	77	59	34	978	1074	104	880	15
Future Volume (veh/h)	15	339	29	475	77	59	34	978	1074	104	880	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	349	0	490	79	55	35	1008	674	107	907	11
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	408	347	547	391	273	46	1299	864	67	1358	16
Arrive On Green	0.02	0.23	0.00	0.19	0.40	0.40	0.03	0.38	0.38	0.01	0.13	0.13
Sat Flow, veh/h	1619	1800	1530	2956	990	689	1619	3420	1530	1619	3460	42
Grp Volume(v), veh/h	15	349	0	490	0	134	35	1008	674	107	448	470
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1678	1619	1710	1530	1619	1710	1791
Q Serve(g_s), s	1.1	22.3	0.0	19.4	0.0	6.3	2.6	31.1	41.1	5.0	30.0	30.0
Cycle Q Clear(g_c), s	1.1	22.3	0.0	19.4	0.0	6.3	2.6	31.1	41.1	5.0	30.0	30.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	27	408	347	547	0	664	46	1299	864	67	671	703
V/C Ratio(X)	0.57	0.85	0.00	0.90	0.00	0.20	0.75	0.78	0.78	1.59	0.67	0.67
Avail Cap(c_a), veh/h	67	555	472	838	0	923	67	1299	864	67	671	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.86	0.86	0.86
Uniform Delay (d), s/veh	58.6	44.5	0.0	47.8	0.0	23.8	57.9	32.7	20.3	59.2	44.8	44.8
Incr Delay (d2), s/veh	6.8	10.8	0.0	5.9	0.0	0.2	1.2	0.4	0.7	315.9	4.5	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.3	0.0	8.4	0.0	2.9	1.2	14.8	17.4	8.2	15.1	15.7
LnGrp Delay(d),s/veh	65.4	55.3	0.0	53.7	0.0	24.0	59.1	33.2	21.0	375.1	49.3	49.1
LnGrp LOS	E	E		D		C	E	C	C	F	D	D
Approach Vol, veh/h		364			624			1717			1025	
Approach Delay, s/veh		55.7			47.3			28.9			83.2	
Approach LOS		E			D			C			F	

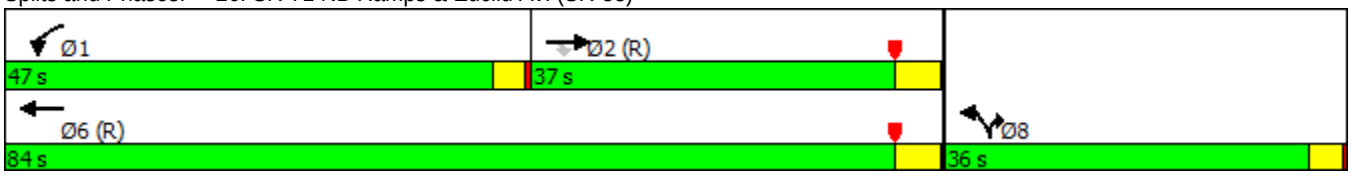
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	51.6	26.2	33.2	7.4	53.1	6.0	53.5
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	43.1	21.4	24.3	4.6	32.0	3.1	8.3
Green Ext Time (p_c), s	0.0	0.0	0.8	2.9	0.0	0.0	0.0	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	49.5
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	827	177	310	1122	152	1350
Future Volume (vph)	827	177	310	1122	152	1350
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	37.0	37.0	47.0	84.0	36.0	36.0
Total Split (%)	30.8%	30.8%	39.2%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	47.0	47.0	29.0	79.5	32.5	32.5
Actuated g/C Ratio	0.39	0.39	0.24	0.66	0.27	0.27
v/c Ratio	0.69	0.28	0.83	0.55	0.19	1.72
Control Delay	37.0	10.9	60.9	3.3	34.3	346.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	10.9	60.9	3.3	34.3	346.8
LOS	D	B	E	A	C	F
Approach Delay	32.4			15.7	315.1	
Approach LOS	C			B	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.72	
Intersection Signal Delay: 134.2	Intersection LOS: F
Intersection Capacity Utilization 119.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	827	177	310	1122	152	1350
Future Volume (veh/h)	827	177	310	1122	152	1350
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	919	0	344	1247	169	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2109	943	372	2950	235	108
Arrive On Green	1.00	0.00	0.22	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	919	0	344	1247	169	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	23.6	9.5	6.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	23.6	9.5	6.0	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2109	943	372	2950	235	108
V/C Ratio(X)	0.44	0.00	0.93	0.42	0.72	0.00
Avail Cap(c_a), veh/h	2109	943	621	2950	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.49	0.49	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	46.0	1.8	54.6	0.0
Incr Delay (d2), s/veh	0.7	0.0	4.6	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	11.7	4.4	2.9	0.0
LnGrp Delay(d),s/veh	0.7	0.0	50.7	2.0	58.7	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	919			1591	169	
Approach Delay, s/veh	0.7			12.5	58.7	
Approach LOS	A			B	E	

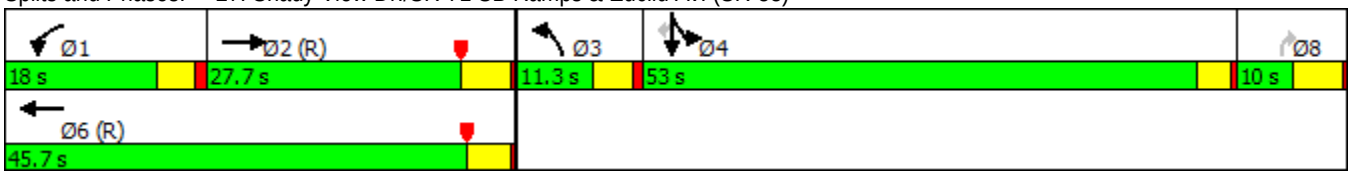
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	29.5	78.5				108.0		12.0
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	43.5	32.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	25.6	2.0				11.5		8.0
Green Ext Time (p_c), s	0.4	15.7				20.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	317	101	235	30	16	741	144	156
Future Volume (vph)	317	101	235	30	16	741	144	156
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	27.7	18.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.1%	15.0%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	36.2	12.0	53.1	6.5	5.0	42.1	42.1	42.1
Actuated g/C Ratio	0.30	0.10	0.44	0.05	0.04	0.35	0.35	0.35
v/c Ratio	0.37	0.65	0.16	0.36	0.08	0.84	0.79	0.25
Control Delay	36.9	64.4	11.5	66.2	0.9	49.8	45.2	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	64.4	11.5	66.2	0.9	49.8	45.2	4.4
LOS	D	E	B	E	A	D	D	A
Approach Delay	36.9		27.4				41.0	
Approach LOS	D		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 37.7	Intersection LOS: D
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	317	44	101	235	0	30	0	16	741	144	156
Future Volume (veh/h)	0	317	44	101	235	0	30	0	16	741	144	156
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	327	45	104	242	0	31	0	16	870	0	161
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1547	211	125	2142	0	0	0	0	981	0	464
Arrive On Green	0.00	0.51	0.51	0.15	1.00	0.00	0.00	0.00	0.00	0.30	0.00	0.30
Sat Flow, veh/h	0	3115	413	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	184	188	104	242	0		0.0		870	0	161
Grp Sat Flow(s),veh/h/ln	0	1710	1727	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	7.1	7.2	7.5	0.0	0.0				30.7	0.0	9.8
Cycle Q Clear(g_c), s	0.0	7.1	7.2	7.5	0.0	0.0				30.7	0.0	9.8
Prop In Lane	0.00		0.24	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	875	884	125	2142	0				981	0	464
V/C Ratio(X)	0.00	0.21	0.21	0.83	0.11	0.00				0.89	0.00	0.35
Avail Cap(c_a), veh/h	0	875	884	182	2142	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.0	16.1	50.0	0.0	0.0				39.9	0.0	32.6
Incr Delay (d2), s/veh	0.0	0.5	0.6	18.8	0.1	0.0				5.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.4	3.5	4.0	0.0	0.0				14.6	0.0	4.2
LnGrp Delay(d),s/veh	0.0	16.6	16.6	68.8	0.1	0.0				45.7	0.0	33.0
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		372			346						1031	
Approach Delay, s/veh		16.6			20.8						43.7	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.8	66.4		39.9		80.1		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	13.5	22.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.5	9.2		32.7		2.0		
Green Ext Time (p_c), s	0.1	2.0		3.6		2.4		

Intersection Summary	
HCM 2010 Ctrl Delay	33.4
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1187	0	0	876	0	0	0	0	0	0	0
Future Vol, veh/h	0	1187	0	0	876	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1249	0	0	922	0	0	0	0	0	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	922	0	-	-	-	0				1547	2171	461
Stage 1	-	-	-	-	-	-				922	922	-
Stage 2	-	-	-	-	-	-				625	1249	-
Critical Hdwy	4.1	-	-	-	-	-				6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-				5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.8	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	749	-	0	0	-	-				107	47	553
Stage 1	-	-	0	0	-	-				353	352	-
Stage 2	-	-	0	0	-	-				501	247	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	749	-	-	-	-	-				107	0	553
Mov Cap-2 Maneuver	-	-	-	-	-	-				236	0	-
Stage 1	-	-	-	-	-	-				353	0	-
Stage 2	-	-	-	-	-	-				501	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	749	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1112	85	27	824	37	20
Future Vol, veh/h	1112	85	27	824	37	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1196	91	29	886	40	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1287	0	2185	644
Stage 1	-	-	-	-	1241	-
Stage 2	-	-	-	-	944	-
Critical Hdwy	-	-	4.1	-	7.3	6.9
Critical Hdwy Stg 1	-	-	-	-	6.5	-
Critical Hdwy Stg 2	-	-	-	-	6.1	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	546	-	~ 30	420
Stage 1	-	-	-	-	188	-
Stage 2	-	-	-	-	317	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	546	-	~ 29	420
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	188	-
Stage 2	-	-	-	-	300	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	28.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	152	420	-	-	546	-
HCM Lane V/C Ratio	0.262	0.051	-	-	0.053	-
HCM Control Delay (s)	36.9	14	-	-	12	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	1	0.2	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1003	38	771	79	22
Future Volume (vph)	1003	38	771	79	22
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.2	5.2	27.4	10.5	10.5
Actuated g/C Ratio	0.49	0.10	0.55	0.21	0.21
v/c Ratio	0.72	0.24	0.82	0.24	0.07
Control Delay	13.2	28.1	16.1	22.3	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	28.1	16.1	22.3	11.0
LOS	B	C	B	C	B
Approach Delay	13.2		16.6	19.8	
Approach LOS	B		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 49.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1003	129	38	771	79	22
Future Volume (veh/h)	1003	129	38	771	79	22
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1056	136	40	812	83	21
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1444	186	68	1085	304	287
Arrive On Green	0.48	0.48	0.04	0.60	0.19	0.19
Sat Flow, veh/h	3127	391	1619	1800	1619	1530
Grp Volume(v), veh/h	594	598	40	812	83	21
Grp Sat Flow(s),veh/h/ln	1710	1718	1619	1800	1619	1530
Q Serve(g_s), s	15.0	15.1	1.3	17.6	2.4	0.6
Cycle Q Clear(g_c), s	15.0	15.1	1.3	17.6	2.4	0.6
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	813	817	68	1085	304	287
V/C Ratio(X)	0.73	0.73	0.59	0.75	0.27	0.07
Avail Cap(c_a), veh/h	918	922	153	1290	304	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.4	11.4	25.4	7.7	18.7	18.0
Incr Delay (d2), s/veh	2.6	2.7	3.0	2.0	2.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	7.6	0.6	9.2	1.2	0.3
LnGrp Delay(d),s/veh	14.0	14.0	28.4	9.8	21.0	18.5
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1192			852	104	
Approach Delay, s/veh	14.0			10.7	20.5	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.9	31.8				38.7		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	3.3	17.1				19.6		4.4
Green Ext Time (p_c), s	0.0	8.5				12.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	942	46	734	76	31
Future Volume (vph)	942	46	734	76	31
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	23.8	5.7	29.2	10.5	10.5
Actuated g/C Ratio	0.47	0.11	0.57	0.21	0.21
v/c Ratio	0.73	0.27	0.77	0.25	0.10
Control Delay	14.8	28.8	13.3	23.3	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	28.8	13.3	23.3	15.9
LOS	B	C	B	C	B
Approach Delay	14.8		14.2	21.2	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	942	120	46	734	76	31
Future Volume (veh/h)	942	120	46	734	76	31
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1013	129	49	789	82	27
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1428	182	79	1089	307	291
Arrive On Green	0.47	0.47	0.05	0.61	0.19	0.19
Sat Flow, veh/h	3133	387	1619	1800	1619	1530
Grp Volume(v), veh/h	569	573	49	789	82	27
Grp Sat Flow(s),veh/h/ln	1710	1721	1619	1800	1619	1530
Q Serve(g_s), s	13.9	14.0	1.6	16.2	2.3	0.8
Cycle Q Clear(g_c), s	13.9	14.0	1.6	16.2	2.3	0.8
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	802	807	79	1089	307	291
V/C Ratio(X)	0.71	0.71	0.62	0.72	0.27	0.09
Avail Cap(c_a), veh/h	932	938	181	1340	307	291
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	11.1	24.6	7.3	18.2	17.6
Incr Delay (d2), s/veh	2.1	2.1	3.0	1.5	2.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	7.0	0.8	8.4	1.2	0.4
LnGrp Delay(d),s/veh	13.2	13.2	27.6	8.8	20.3	18.2
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1142			838	109	
Approach Delay, s/veh	13.2			9.9	19.8	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.2	30.9				38.1		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.6	16.0				18.2		4.3
Green Ext Time (p_c), s	0.0	8.7				12.3		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	44.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	266	662	46	14	410	89	25	6	9	74	17	346
Future Vol, veh/h	266	662	46	14	410	89	25	6	9	74	17	346
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	283	704	49	15	436	95	27	6	10	79	18	368

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	531	0	0	757	0	0	2005	1860	381	1434	1836	484
Stage 1	-	-	-	-	-	-	1299	1299	-	513	513	-
Stage 2	-	-	-	-	-	-	706	561	-	921	1323	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1047	-	-	863	-	-	40	74	623	104	77	587
Stage 1	-	-	-	-	-	-	174	234	-	548	539	-
Stage 2	-	-	-	-	-	-	430	513	-	295	228	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1047	-	-	863	-	-	~ 10	53	621	~ 77	55	587
Mov Cap-2 Maneuver	-	-	-	-	-	-	606	111	-	146	123	-
Stage 1	-	-	-	-	-	-	126	170	-	400	530	-
Stage 2	-	-	-	-	-	-	152	504	-	204	166	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.7	0.3	16.2	190.4
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	364	1047	-	-	863	-	-	354
HCM Lane V/C Ratio	0.117	0.27	-	-	0.017	-	-	1.313
HCM Control Delay (s)	16.2	9.7	-	-	9.2	-	-	190.4
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.4	1.1	-	-	0.1	-	-	21.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	678	37	18	419	2	23	0	12	11	0	71
Future Vol, veh/h	30	678	37	18	419	2	23	0	12	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	770	42	20	476	2	26	0	14	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	478	0	0	813	0	0	1414	1376	406	968	1396	477
Stage 1	-	-	-	-	-	-	857	857	-	518	518	-
Stage 2	-	-	-	-	-	-	557	519	-	450	878	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1095	-	-	823	-	-	108	146	600	223	142	592
Stage 1	-	-	-	-	-	-	323	377	-	544	536	-
Stage 2	-	-	-	-	-	-	518	536	-	564	368	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1095	-	-	823	-	-	90	138	600	209	134	592
Mov Cap-2 Maneuver	-	-	-	-	-	-	249	303	-	209	134	-
Stage 1	-	-	-	-	-	-	313	366	-	528	523	-
Stage 2	-	-	-	-	-	-	440	523	-	535	357	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	18.3	14.3
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	311	1095	-	-	823	-	-	475
HCM Lane V/C Ratio	0.128	0.03	-	-	0.025	-	-	0.188
HCM Control Delay (s)	18.3	8.4	-	-	9.5	-	-	14.3
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	0.7

Intersection	
Intersection Delay, s/veh	23.7
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	339	0	361	0	0	0	0	0	190	154	0
Future Vol, veh/h	0	339	0	361	0	0	0	0	0	190	154	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	365	0	388	0	0	0	0	0	204	166	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	28.2	16.6
HCM LOS	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	154	339	361	322	201
LT Vol	190	0	339	0	0	0
Through Vol	0	154	0	0	322	0
RT Vol	0	0	0	361	0	201
Lane Flow Rate	204	166	365	388	346	216
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.469	0.357	0.785	0.704	0.721	0.407
Departure Headway (Hd)	8.267	7.751	7.756	6.532	7.492	6.772
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	437	465	470	555	485	532
Service Time	6.007	5.491	5.456	4.232	5.227	4.507
HCM Lane V/C Ratio	0.467	0.357	0.777	0.699	0.713	0.406
HCM Control Delay	18.1	14.8	33.4	23.3	27.3	14.1
HCM Lane LOS	C	B	D	C	D	B
HCM 95th-tile Q	2.4	1.6	7	5.6	5.8	2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	322	201
Future Vol, veh/h	0	0	322	201
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	346	216
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	22.2
HCM LOS	C

APPENDIX 6.2:

OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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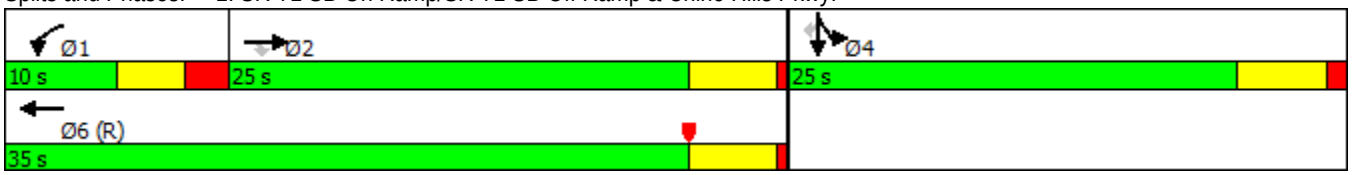
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1221	317	6	964	522	85	399
Future Volume (vph)	1221	317	6	964	522	85	399
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.43	0.37	0.04	0.57	0.61	0.57	0.70
Control Delay	11.6	3.2	27.5	9.5	22.9	21.4	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	3.2	27.5	9.5	22.9	21.4	20.0
LOS	B	A	C	A	C	C	B
Approach Delay	9.9			9.6		21.3	
Approach LOS	A			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1221	317	6	964	0	0	0	0	522	85	399
Future Volume (veh/h)	0	1221	317	6	964	0	0	0	0	522	85	399
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1259	257	6	994	0				601	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1259	257	6	994	0				601	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	8.9	7.1	0.2	9.2	0.0				9.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.9	7.1	0.2	9.2	0.0				9.1	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.49	0.40	0.47	0.57	0.00				0.56	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.76	0.76	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.8	12.3	29.6	6.3	0.0				16.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.4	7.3	1.0	0.0				2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	3.0	0.1	4.5	0.0				4.3	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.9	12.7	36.9	7.3	0.0				18.4	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1516			1000						601	
Approach Delay, s/veh		12.9			7.5						18.4	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	10.9		11.1		11.2		
Green Ext Time (p_c), s	0.0	8.2		1.2		15.0		

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	559	1184	595	341	376	200
Future Volume (vph)	559	1184	595	341	376	200
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	15.0	46.0	31.0	31.0	14.0	14.0
Total Split (%)	25.0%	76.7%	51.7%	51.7%	23.3%	23.3%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.0	39.5	24.5	24.5	8.0	8.0
Actuated g/C Ratio	0.17	0.66	0.41	0.41	0.13	0.13
v/c Ratio	1.20	0.55	0.45	0.51	1.03	0.97
Control Delay	134.4	6.4	14.1	10.7	104.5	65.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	134.4	6.4	14.1	10.7	104.5	65.7
LOS	F	A	B	B	F	E
Approach Delay		47.5	12.9			78.4
Approach LOS		D	B			E

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 43.1	Intersection LOS: D
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	559	1184	0	0	595	341	376	200	9	0	0	0
Future Volume (veh/h)	559	1184	0	0	595	341	376	200	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	588	1246	0	0	626	358	412	189	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	493	2252	0	0	1396	615	432	231	7			
Arrive On Green	0.17	0.66	0.00	0.00	0.41	0.41	0.13	0.13	0.13			
Sat Flow, veh/h	2956	3510	0	0	3510	1506	3238	1735	55			
Grp Volume(v), veh/h	588	1246	0	0	626	358	412	0	195			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1506	1619	0	1790			
Q Serve(g_s), s	10.0	11.7	0.0	0.0	8.0	11.1	7.6	0.0	6.4			
Cycle Q Clear(g_c), s	10.0	11.7	0.0	0.0	8.0	11.1	7.6	0.0	6.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	493	2252	0	0	1397	615	432	0	239			
V/C Ratio(X)	1.19	0.55	0.00	0.00	0.45	0.58	0.95	0.00	0.82			
Avail Cap(c_a), veh/h	493	2252	0	0	1397	615	432	0	239			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.88	0.88	0.00	0.00	0.66	0.66	1.00	0.00	1.00			
Uniform Delay (d), s/veh	25.0	5.5	0.0	0.0	12.9	13.8	25.8	0.0	25.3			
Incr Delay (d2), s/veh	103.8	0.9	0.0	0.0	0.7	2.7	33.3	0.0	25.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.1	5.6	0.0	0.0	3.9	5.0	5.4	0.0	4.8			
LnGrp Delay(d),s/veh	128.8	6.4	0.0	0.0	13.5	16.4	59.1	0.0	50.9			
LnGrp LOS	F	A			B	B	E		D			
Approach Vol, veh/h		1834			984			607				
Approach Delay, s/veh		45.6			14.6			56.5				
Approach LOS		D			B			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		46.0			15.0	31.0		14.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		39.5			10.0	24.5		8.0
Max Q Clear Time (g_c+I1), s		13.7			12.0	13.1		9.6
Green Ext Time (p_c), s		16.6			0.0	9.0		0.0

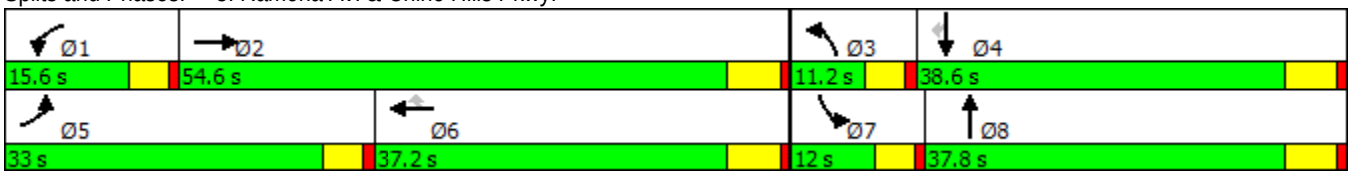
Intersection Summary	
HCM 2010 Ctrl Delay	38.6
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	354	835	67	658	98	27	399	86	181	250
Future Volume (vph)	354	835	67	658	98	27	399	86	181	250
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	28.3	50.7	8.9	29.1	29.1	6.0	32.0	7.4	37.5	37.5
Actuated g/C Ratio	0.24	0.43	0.08	0.25	0.25	0.05	0.27	0.06	0.32	0.32
v/c Ratio	0.96	0.42	0.58	0.82	0.21	0.34	0.63	0.90	0.18	0.40
Control Delay	82.0	24.7	72.0	50.7	2.5	66.2	38.5	121.3	31.6	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.0	24.7	72.0	50.7	2.5	66.2	38.5	121.3	31.6	6.0
LOS	F	C	E	D	A	E	D	F	C	A
Approach Delay		41.7		46.7			39.8		34.2	
Approach LOS		D		D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.7	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 41.4	Intersection LOS: D
Intersection Capacity Utilization 90.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	354	835	4	67	658	98	27	399	150	86	181	250
Future Volume (veh/h)	354	835	4	67	658	98	27	399	150	86	181	250
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	373	879	3	71	693	86	28	420	90	91	191	167
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	393	2176	7	88	828	365	41	766	163	102	1065	468
Arrive On Green	0.24	0.43	0.43	0.05	0.24	0.24	0.03	0.27	0.27	0.06	0.31	0.31
Sat Flow, veh/h	1619	5055	17	1619	3420	1507	1619	2800	595	1619	3420	1504
Grp Volume(v), veh/h	373	570	312	71	693	86	28	255	255	91	191	167
Grp Sat Flow(s),veh/h/ln	1619	1638	1797	1619	1710	1507	1619	1710	1684	1619	1710	1504
Q Serve(g_s), s	26.5	14.0	14.0	5.1	22.5	5.4	2.0	14.9	15.1	6.5	4.8	10.1
Cycle Q Clear(g_c), s	26.5	14.0	14.0	5.1	22.5	5.4	2.0	14.9	15.1	6.5	4.8	10.1
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	393	1410	773	88	828	365	41	468	461	102	1065	468
V/C Ratio(X)	0.95	0.40	0.40	0.80	0.84	0.24	0.68	0.54	0.55	0.89	0.18	0.36
Avail Cap(c_a), veh/h	393	1410	773	152	919	405	91	468	461	102	1065	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	23.0	23.0	54.6	42.1	35.6	56.5	36.2	36.3	54.3	29.3	31.2
Incr Delay (d2), s/veh	32.0	0.3	0.5	6.2	6.7	0.5	7.0	4.5	4.7	53.6	0.4	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	6.4	7.0	2.4	11.4	2.3	1.0	7.6	7.6	4.5	2.3	4.4
LnGrp Delay(d),s/veh	75.5	23.2	23.4	60.9	48.8	36.1	63.5	40.7	41.1	107.9	29.7	33.3
LnGrp LOS	E	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1255			850			538			449	
Approach Delay, s/veh		38.8			48.6			42.1			46.9	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	56.1	7.6	42.2	33.0	34.1	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	7.1	16.0	4.0	12.1	28.5	24.5	8.5	17.1
Green Ext Time (p_c), s	0.0	17.9	0.0	4.5	0.0	3.8	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	854	97	28	702	109	32
Future Vol, veh/h	854	97	28	702	109	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	938	107	31	771	120	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	938	0	1385	469
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	739	-	137	546
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	739	-	131	546
Mov Cap-2 Maneuver	-	-	-	-	302	-
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	591	-

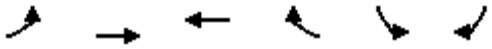
Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	24.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	336	-	-	739	-
HCM Lane V/C Ratio	0.461	-	-	0.042	-
HCM Control Delay (s)	24.6	-	-	10.1	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	2.3	-	-	0.1	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	221	665	632	66	98
Future Volume (vph)	221	665	632	66	98
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	91.0	49.0	29.0	42.0
Total Split (%)	35.0%	75.8%	40.8%	24.2%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	17.2	47.4	25.5	23.7	42.1
Actuated g/C Ratio	0.21	0.57	0.31	0.29	0.51
v/c Ratio	0.72	0.37	0.69	0.09	0.13
Control Delay	44.0	9.7	29.2	26.4	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	9.7	29.2	26.4	3.9
LOS	D	A	C	C	A
Approach Delay		18.3	29.2	12.9	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 82.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 55.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	221	665	632	31	66	98
Future Volume (veh/h)	221	665	632	31	66	98
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	240	723	687	34	72	32
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	277	1999	1190	59	819	685
Arrive On Green	0.17	0.58	0.36	0.36	0.28	0.28
Sat Flow, veh/h	1619	3510	3407	164	2956	1530
Grp Volume(v), veh/h	240	723	354	367	72	32
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1771	1478	1530
Q Serve(g_s), s	12.1	9.3	14.0	14.0	1.5	1.0
Cycle Q Clear(g_c), s	12.1	9.3	14.0	14.0	1.5	1.0
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	277	1999	613	635	819	685
V/C Ratio(X)	0.87	0.36	0.58	0.58	0.09	0.05
Avail Cap(c_a), veh/h	723	3478	882	913	819	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	9.2	21.7	21.7	22.4	13.0
Incr Delay (d2), s/veh	3.2	0.2	1.2	1.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	4.4	6.8	7.0	0.6	1.2
LnGrp Delay(d),s/veh	37.0	9.3	23.0	22.9	22.7	13.2
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		963	721		104	
Approach Delay, s/veh		16.2	22.9		19.7	
Approach LOS		B	C		B	

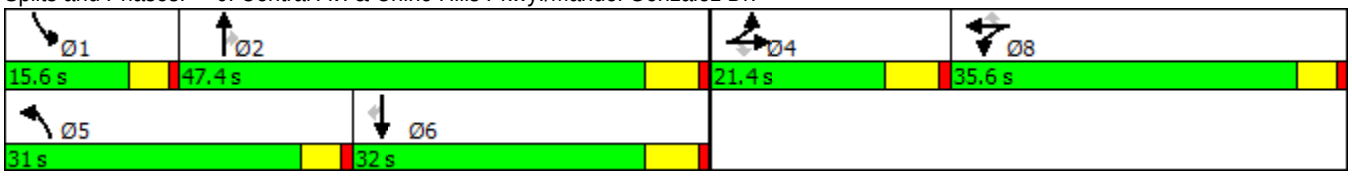
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		54.8		29.0	18.9	35.8		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	37.4	43.2		
Max Q Clear Time (g_c+I1), s		11.3		3.5	14.1	16.0		
Green Ext Time (p_c), s		19.8		0.3	0.3	14.0		

Intersection Summary	
HCM 2010 Ctrl Delay	19.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	306	52	272	2	3	7	373	828	45	65	684	254
Future Volume (vph)	306	52	272	2	3	7	373	828	45	65	684	254
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	15.9	13.5	13.5	13.5	26.9	47.7	47.7	8.1	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.51	0.51	0.09	0.28	0.28
v/c Ratio	0.75	0.71	0.59	0.01	0.01	0.02	0.88	0.52	0.06	0.51	0.77	0.49
Control Delay	59.0	55.0	10.5	35.5	35.3	0.1	56.3	21.1	0.1	57.7	39.3	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	55.0	10.5	35.5	35.3	0.1	56.3	21.1	0.1	57.7	39.3	14.4
LOS	E	D	B	D	D	A	E	C	A	E	D	B
Approach Delay		36.9			13.7			30.9			34.2	
Approach LOS		D			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 33.3	Intersection LOS: C
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	52	272	2	3	7	373	828	45	65	684	254
Future Volume (veh/h)	306	52	272	2	3	7	373	828	45	65	684	254
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	374	0	200	2	3	3	405	900	37	71	743	221
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	510	0	241	33	36	31	437	1789	784	88	1053	465
Arrive On Green	0.16	0.00	0.16	0.02	0.02	0.02	0.27	0.52	0.52	0.05	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	374	0	200	2	3	3	405	900	37	71	743	221
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	9.4	0.0	10.8	0.1	0.1	0.2	20.7	14.5	1.0	3.7	16.4	10.1
Cycle Q Clear(g_c), s	9.4	0.0	10.8	0.1	0.1	0.2	20.7	14.5	1.0	3.7	16.4	10.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	510	0	241	33	36	31	437	1789	784	88	1053	465
V/C Ratio(X)	0.73	0.00	0.83	0.06	0.08	0.10	0.93	0.50	0.05	0.80	0.71	0.48
Avail Cap(c_a), veh/h	593	0	280	590	655	557	502	1789	784	209	1053	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	0.0	34.7	40.9	40.9	40.9	30.2	13.1	9.9	39.8	26.1	23.9
Incr Delay (d2), s/veh	3.9	0.0	16.4	0.8	1.0	1.3	20.6	1.0	0.1	6.2	4.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	5.6	0.1	0.1	0.1	11.7	7.0	0.4	1.8	8.3	4.6
LnGrp Delay(d),s/veh	38.1	0.0	51.2	41.7	41.9	42.3	50.8	14.1	10.0	46.0	30.0	27.3
LnGrp LOS	D		D	D	D	D	D	B	B	D	C	C
Approach Vol, veh/h		574			8			1342			1035	
Approach Delay, s/veh		42.6			42.0			25.1			30.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.2	50.3		19.2	27.6	32.0		6.3
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.7	16.5		12.8	22.7	18.4		2.2
Green Ext Time (p_c), s	0.0	17.3		0.6	0.3	6.6		0.0

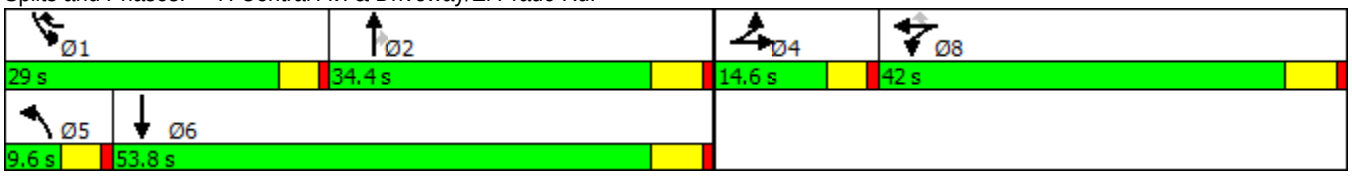
Intersection Summary	
HCM 2010 Ctrl Delay	30.5
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1034	3	506	2	767	707	411	627
Future Volume (vph)	1	1	1034	3	506	2	767	707	411	627
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	1.12	1.06	0.54	0.03	0.94	0.82	1.26	0.28
Control Delay	48.0	41.0	111.3	91.3	8.0	53.0	58.4	11.7	172.0	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	111.3	91.3	8.0	53.0	58.4	11.7	172.0	16.3
LOS	D	D	F	F	A	D	E	B	F	B
Approach Delay		43.3		70.7			36.0			77.4
Approach LOS		D		E			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 59.8	Intersection LOS: E
Intersection Capacity Utilization 100.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1034	3	506	2	767	707	411	627	9
Future Volume (veh/h)	1	1	1	1034	3	506	2	767	707	411	627	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1151	0	419	2	852	617	457	697	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1057	0	836	4	882	390	356	2380	27
Arrive On Green	0.01	0.01	0.01	0.33	0.00	0.33	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5008	57
Grp Volume(v), veh/h	1	0	2	1151	0	419	2	852	617	457	456	249
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1790
Q Serve(g_s), s	0.1	0.0	0.1	36.2	0.0	19.0	0.1	27.3	28.6	24.4	9.4	9.4
Cycle Q Clear(g_c), s	0.1	0.0	0.1	36.2	0.0	19.0	0.1	27.3	28.6	24.4	9.4	9.4
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1057	0	836	4	882	390	356	1557	851
V/C Ratio(X)	0.08	0.00	0.15	1.09	0.00	0.50	0.46	0.97	1.58	1.28	0.29	0.29
Avail Cap(c_a), veh/h	146	0	149	1057	0	836	73	882	390	356	1557	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	37.3	0.0	15.7	55.2	40.7	41.1	43.2	17.7	17.7
Incr Delay (d2), s/veh	0.9	0.0	2.0	55.1	0.0	0.5	25.4	23.1	274.7	147.1	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	24.1	0.0	8.1	0.1	15.7	41.5	25.3	4.3	4.8
LnGrp Delay(d),s/veh	55.5	0.0	56.6	92.4	0.0	16.2	80.6	63.7	315.9	190.3	18.2	18.6
LnGrp LOS	E		E	F		B	F	E	F	F	B	B
Approach Vol, veh/h		3			1570			1471			1162	
Approach Delay, s/veh		56.2			72.1			169.5			86.0	
Approach LOS		E			E			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		42.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	11.4		38.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	24.3		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		110.0
HCM 2010 LOS		F

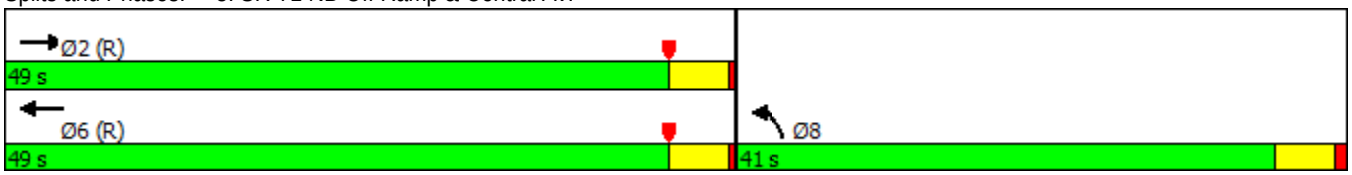
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1195	878	101
Future Volume (vph)	1195	878	101
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	49.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	58.1	58.1	22.4
Actuated g/C Ratio	0.65	0.65	0.25
v/c Ratio	0.87dr	0.33	1.20dr
Control Delay	8.7	8.1	38.4
Queue Delay	0.0	0.0	0.0
Total Delay	8.7	8.1	38.4
LOS	A	A	D
Approach Delay	8.7	8.1	38.4
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 67.7%	ICU Level of Service C
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1195	794	0	878	101	378
Future Volume (veh/h)	1195	794	0	878	101	378
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1440	957	0	1058	122	262
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2292	1071	0	3438	315	298
Arrive On Green	1.00	1.00	0.00	0.70	0.19	0.19
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1440	957	0	1058	122	262
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	7.4	5.9	15.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.4	5.9	15.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2292	1071	0	3438	315	298
V/C Ratio(X)	0.63	0.89	0.00	0.31	0.39	0.88
Avail Cap(c_a), veh/h	2292	1071	0	3438	648	612
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.2	31.6	35.2
Incr Delay (d2), s/veh	1.3	11.4	0.0	0.2	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.4	0.0	3.4	2.7	6.6
LnGrp Delay(d),s/veh	1.3	11.4	0.0	5.4	31.8	38.5
LnGrp LOS	A	B		A	C	D
Approach Vol, veh/h	2397			1058	384	
Approach Delay, s/veh	5.4			5.4	36.4	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		67.5				67.5		22.5
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		36.0
Max Q Clear Time (g_c+I1), s		2.0				9.4		17.0
Green Ext Time (p_c), s		28.9				25.3		0.6

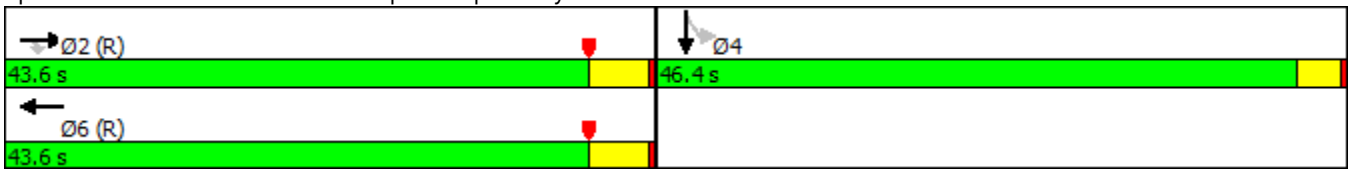
Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1386	72	778	603	0
Future Volume (vph)	1386	72	778	603	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	41.6	41.6	41.6	40.4	40.4
Actuated g/C Ratio	0.46	0.46	0.46	0.45	0.45
v/c Ratio	0.77	0.12	0.55	0.92	0.83
Control Delay	23.8	4.0	13.0	43.3	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	4.0	13.0	43.3	31.2
LOS	C	A	B	D	C
Approach Delay	22.8		13.0		37.5
Approach LOS	C		B		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1386	72	0	778	200	0	0	0	603	0	357
Future Volume (veh/h)	0	1386	72	0	778	200	0	0	0	603	0	357
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1754	0	0	985	253				537	316	311
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2465	767	0	1956	501				663	342	336
Arrive On Green	0.00	0.50	0.00	0.00	1.00	1.00				0.41	0.41	0.41
Sat Flow, veh/h	0	5076	1530	0	4062	1000				1619	834	821
Grp Volume(v), veh/h	0	1754	0	0	827	411				537	0	627
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1624				1619	0	1655
Q Serve(g_s), s	0.0	24.9	0.0	0.0	0.0	0.0				26.4	0.0	32.4
Cycle Q Clear(g_c), s	0.0	24.9	0.0	0.0	0.0	0.0				26.4	0.0	32.4
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.50
Lane Grp Cap(c), veh/h	0	2465	767	0	1643	814				663	0	678
V/C Ratio(X)	0.00	0.71	0.00	0.00	0.50	0.50				0.81	0.00	0.93
Avail Cap(c_a), veh/h	0	2465	767	0	1643	814				772	0	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.4	0.0	0.0	0.0	0.0				23.5	0.0	25.3
Incr Delay (d2), s/veh	0.0	1.8	0.0	0.0	1.1	2.2				4.8	0.0	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.6	0.0	0.0	0.3	0.5				12.7	0.0	17.5
LnGrp Delay(d),s/veh	0.0	19.2	0.0	0.0	1.1	2.2				28.3	0.0	39.6
LnGrp LOS		B			A	A				C		D
Approach Vol, veh/h		1754			1238						1164	
Approach Delay, s/veh		19.2			1.5						34.4	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		49.6		40.4		49.6		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		26.9		34.4		2.0		
Green Ext Time (p_c), s		10.5		2.4		25.5		

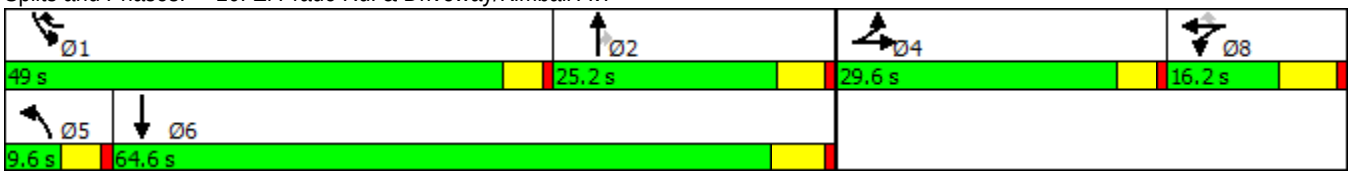
Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	1	26	1263	5	282	32	771	205
Future Volume (vph)	11	1	26	1263	5	282	32	771	205
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	58.1	5.2	19.7	19.7	45.8	59.7
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.21	0.21	0.48	0.63
v/c Ratio	0.05	0.01	0.29	1.10	0.06	0.77	0.08	1.01	0.12
Control Delay	40.1	30.3	49.7	69.4	52.6	54.2	0.3	65.0	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.3	49.7	69.4	52.6	54.2	0.3	65.0	9.3
LOS	D	C	D	E	D	D	A	E	A
Approach Delay		38.0	68.6			48.8			51.4
Approach LOS		D	E			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 59.5	Intersection LOS: E
Intersection Capacity Utilization 118.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	2	28	26	1263	5	282	32	771	205	43
Future Volume (veh/h)	11	1	2	28	26	1263	5	282	32	771	205	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	1	1	29	27	428	5	288	33	787	209	44
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	49	25	25	94	88	863	84	334	284	746	1677	346
Arrive On Green	0.03	0.03	0.03	0.10	0.10	0.10	0.05	0.19	0.19	0.46	0.59	0.59
Sat Flow, veh/h	1619	827	827	909	846	1530	1619	1800	1530	1619	2823	583
Grp Volume(v), veh/h	11	0	2	56	0	428	5	288	33	787	125	128
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1697
Q Serve(g_s), s	0.6	0.0	0.1	2.8	0.0	10.0	0.3	15.0	1.7	44.4	3.1	3.2
Cycle Q Clear(g_c), s	0.6	0.0	0.1	2.8	0.0	10.0	0.3	15.0	1.7	44.4	3.1	3.2
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	49	0	50	182	0	863	84	334	284	746	1016	1008
V/C Ratio(X)	0.22	0.00	0.04	0.31	0.00	0.50	0.06	0.86	0.12	1.06	0.12	0.13
Avail Cap(c_a), veh/h	420	0	429	182	0	863	84	373	317	746	1043	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	0.0	45.4	40.0	0.0	12.7	43.5	38.1	32.7	26.0	8.6	8.6
Incr Delay (d2), s/veh	2.2	0.0	0.3	0.9	0.0	0.4	0.1	17.0	0.2	48.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	1.4	0.0	6.9	0.1	9.0	0.7	29.7	1.5	1.5
LnGrp Delay(d),s/veh	47.9	0.0	45.7	41.0	0.0	13.2	43.6	55.1	32.9	74.6	8.6	8.6
LnGrp LOS	D		D	D		B	D	E	C	F	A	A
Approach Vol, veh/h		13			484			326			1040	
Approach Delay, s/veh		47.5			16.4			52.7			58.6	
Approach LOS		D			B			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	49.0	23.7		7.5	9.6	63.1		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	46.4	17.0		2.6	2.3	5.2		12.0
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	3.3		0.0

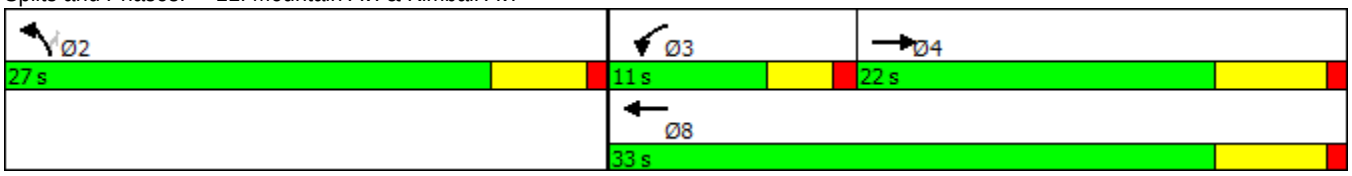
Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	693	132	1090	272	50
Future Volume (vph)	693	132	1090	272	50
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	15.1	7.4	23.2	12.7	12.7
Actuated g/C Ratio	0.32	0.15	0.48	0.27	0.27
v/c Ratio	0.79	0.55	0.69	0.66	0.12
Control Delay	23.6	34.6	12.4	24.8	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	34.6	12.4	24.8	5.6
LOS	C	C	B	C	A
Approach Delay	23.6		14.8	21.8	
Approach LOS	C		B	C	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 47.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 18.8		Intersection LOS: B	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	693	127	132	1090	272	50
Future Volume (veh/h)	693	127	132	1090	272	50
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	722	127	138	1135	283	47
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	931	164	206	1832	349	330
Arrive On Green	0.32	0.32	0.13	0.54	0.22	0.22
Sat Flow, veh/h	2998	511	1619	3510	1619	1530
Grp Volume(v), veh/h	424	425	138	1135	283	47
Grp Sat Flow(s),veh/h/ln	1710	1710	1619	1710	1619	1530
Q Serve(g_s), s	10.2	10.2	3.7	10.5	7.5	1.1
Cycle Q Clear(g_c), s	10.2	10.2	3.7	10.5	7.5	1.1
Prop In Lane		0.30	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	548	548	206	1832	349	330
V/C Ratio(X)	0.77	0.78	0.67	0.62	0.81	0.14
Avail Cap(c_a), veh/h	603	603	250	2035	774	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	13.9	18.9	7.3	16.9	14.4
Incr Delay (d2), s/veh	4.9	4.9	3.1	0.3	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	5.5	1.8	5.0	3.5	0.5
LnGrp Delay(d),s/veh	18.9	18.9	22.0	7.6	18.7	14.5
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	849			1273	330	
Approach Delay, s/veh	18.9			9.2	18.1	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		15.1	9.8	20.5				30.3
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		9.5	5.7	12.2				12.5
Green Ext Time (p_c), s		0.2	0.0	2.3				5.5

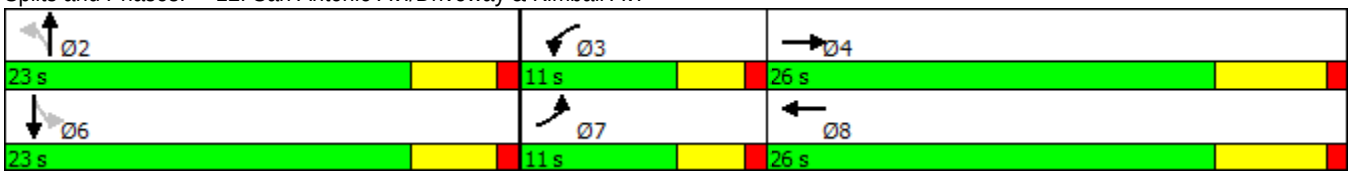
Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	625	36	1225	63	0	46	0
Future Volume (vph)	38	625	36	1225	63	0	46	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	26.0	11.0	26.0	23.0	23.0	23.0	23.0
Total Split (%)	18.3%	43.3%	18.3%	43.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	20.7	7.2	20.7	9.0	9.0	9.0	9.0
Actuated g/C Ratio	0.16	0.46	0.16	0.46	0.20	0.20	0.20	0.20
v/c Ratio	0.15	0.47	0.15	0.83	0.26	0.03	0.19	0.01
Control Delay	21.7	11.3	21.6	21.2	18.9	0.1	17.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	11.3	21.6	21.2	18.9	0.1	17.9	0.0
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.8		21.2		15.2		16.2
Approach LOS		B		C		B		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 44.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 17.7 — Intersection LOS: B
Intersection Capacity Utilization 56.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	625	64	36	1225	18	63	0	15	46	0	5
Future Volume (veh/h)	38	625	64	36	1225	18	63	0	15	46	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	40	665	68	38	1303	19	67	0	13	49	0	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1364	139	96	1497	22	380	0	247	373	0	247
Arrive On Green	0.06	0.44	0.44	0.06	0.43	0.43	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	1619	3126	319	1619	3451	50	1354	0	1530	1344	0	1530
Grp Volume(v), veh/h	40	363	370	38	645	677	67	0	13	49	0	5
Grp Sat Flow(s),veh/h/ln	1619	1710	1736	1619	1710	1791	1354	0	1530	1344	0	1530
Q Serve(g_s), s	1.0	6.6	6.6	1.0	14.9	14.9	1.9	0.0	0.3	1.4	0.0	0.1
Cycle Q Clear(g_c), s	1.0	6.6	6.6	1.0	14.9	14.9	2.0	0.0	0.3	1.7	0.0	0.1
Prop In Lane	1.00		0.18	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	746	757	96	742	777	380	0	247	373	0	247
V/C Ratio(X)	0.40	0.49	0.49	0.40	0.87	0.87	0.18	0.00	0.05	0.13	0.00	0.02
Avail Cap(c_a), veh/h	261	788	800	261	788	825	727	0	638	717	0	638
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.6	8.8	8.8	19.7	11.2	11.2	16.2	0.0	15.4	16.1	0.0	15.3
Incr Delay (d2), s/veh	1.0	0.2	0.2	1.0	9.4	9.0	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.1	3.1	0.5	8.7	9.1	0.7	0.0	0.1	0.5	0.0	0.1
LnGrp Delay(d),s/veh	20.6	8.9	8.9	20.6	20.5	20.2	16.2	0.0	15.4	16.2	0.0	15.3
LnGrp LOS	C	A	A	C	C	C	B		B	B		B
Approach Vol, veh/h		773			1360			80			54	
Approach Delay, s/veh		9.5			20.4			16.1			16.1	
Approach LOS		A			C			B			B	

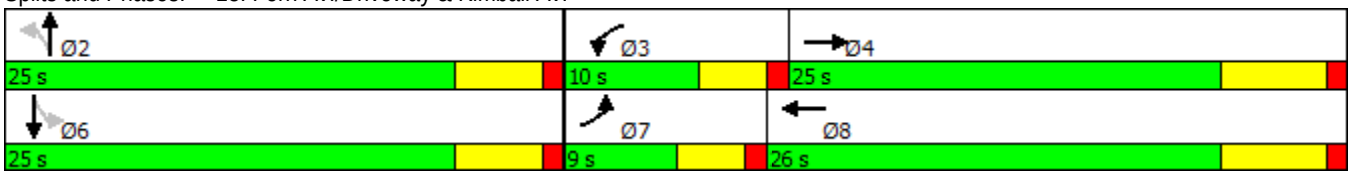
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.6	24.9		11.9	6.7	24.8
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		4.0	3.0	8.6		3.7	3.0	16.9
Green Ext Time (p_c), s		0.1	0.0	4.7		0.1	0.0	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	573	38	1274	45	0	65	1
Future Volume (vph)	36	573	38	1274	45	0	65	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	20.9	5.5	21.2	8.1	8.1	8.1	8.1
Actuated g/C Ratio	0.12	0.48	0.13	0.49	0.19	0.19	0.19	0.19
v/c Ratio	0.21	0.44	0.20	0.86	0.21	0.05	0.31	0.03
Control Delay	24.3	10.7	23.4	21.9	17.3	0.2	19.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	10.7	23.4	21.9	17.3	0.2	19.0	9.6
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.4		22.0		11.2		17.8
Approach LOS		B		C		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	573	66	38	1274	20	45	0	25	65	1	8
Future Volume (veh/h)	36	573	66	38	1274	20	45	0	25	65	1	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	40	637	66	42	1416	22	50	0	18	72	1	8
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	72	1465	152	75	1624	25	338	0	189	329	21	171
Arrive On Green	0.04	0.47	0.47	0.05	0.47	0.47	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1619	3122	323	1619	3447	54	1349	0	1530	1338	173	1383
Grp Volume(v), veh/h	40	348	355	42	702	736	50	0	18	72	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1735	1619	1710	1790	1349	0	1530	1338	0	1556
Q Serve(g_s), s	1.0	5.5	5.5	1.0	14.9	14.9	1.4	0.0	0.4	2.0	0.0	0.2
Cycle Q Clear(g_c), s	1.0	5.5	5.5	1.0	14.9	14.9	1.6	0.0	0.4	2.5	0.0	0.2
Prop In Lane	1.00		0.19	1.00		0.03	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	72	803	814	75	806	844	338	0	189	329	0	192
V/C Ratio(X)	0.55	0.43	0.44	0.56	0.87	0.87	0.15	0.00	0.10	0.22	0.00	0.05
Avail Cap(c_a), veh/h	200	815	827	240	857	898	841	0	760	828	0	773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.9	7.2	7.2	18.9	9.6	9.6	16.3	0.0	15.7	16.8	0.0	15.6
Incr Delay (d2), s/veh	2.4	0.1	0.1	2.4	8.8	8.5	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.5	2.6	0.5	8.8	9.1	0.5	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	21.4	7.3	7.3	21.3	18.4	18.1	16.4	0.0	15.8	17.0	0.0	15.7
LnGrp LOS	C	A	A	C	B	B	B		B	B		B
Approach Vol, veh/h		743			1480			68			81	
Approach Delay, s/veh		8.1			18.3			16.3			16.8	
Approach LOS		A			B			B			B	

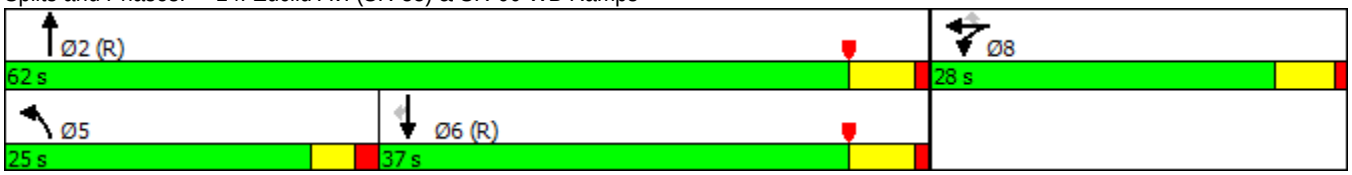
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	5.9	24.7		9.9	5.8	24.8
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.6	3.0	7.5		4.5	3.0	16.9
Green Ext Time (p_c), s		0.1	0.0	5.0		0.1	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	752	2	378	457	964	1037	480
Future Volume (vph)	752	2	378	457	964	1037	480
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.0	23.0	23.0	20.5	56.5	31.5	31.5
Actuated g/C Ratio	0.26	0.26	0.26	0.23	0.63	0.35	0.35
v/c Ratio	1.09	1.06	0.80	1.34	0.48	0.93	0.61
Control Delay	107.3	96.0	35.5	184.4	21.8	43.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	2.4	0.9	0.0
Total Delay	107.3	96.0	35.5	184.4	24.2	44.1	5.6
LOS	F	F	D	F	C	D	A
Approach Delay		81.8			75.7	31.9	
Approach LOS		F			E	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 61.1	Intersection LOS: E
Intersection Capacity Utilization 135.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	752	2	378	457	964	0	0	1037	480
Future Volume (veh/h)	0	0	0	752	2	378	457	964	0	0	1037	480
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				888	0	168	491	1037	0	0	1115	516
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				828	0	391	369	2147	0	0	1197	515
Arrive On Green				0.26	0.00	0.26	0.46	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1473
Grp Volume(v), veh/h				888	0	168	491	1037	0	0	1115	516
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1473
Q Serve(g_s), s				23.0	0.0	8.3	20.5	0.0	0.0	0.0	28.3	31.5
Cycle Q Clear(g_c), s				23.0	0.0	8.3	20.5	0.0	0.0	0.0	28.3	31.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				828	0	391	369	2147	0	0	1197	515
V/C Ratio(X)				1.07	0.00	0.43	1.33	0.48	0.00	0.00	0.93	1.00
Avail Cap(c_a), veh/h				828	0	391	369	2147	0	0	1197	515
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.27	0.27	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.5	0.0	28.0	24.5	0.0	0.0	0.0	28.2	29.3
Incr Delay (d2), s/veh				52.8	0.0	0.3	154.3	0.2	0.0	0.0	14.0	39.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.3	0.0	3.5	24.8	0.1	0.0	0.0	15.7	18.5
LnGrp Delay(d),s/veh				86.3	0.0	28.3	178.8	0.2	0.0	0.0	42.3	69.2
LnGrp LOS				F		C	F	A			D	F
Approach Vol, veh/h					1056			1528			1631	
Approach Delay, s/veh					77.1			57.6			50.8	
Approach LOS					E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			25.0	37.0		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			22.5	33.5		25.0
Green Ext Time (p_c), s		42.5			0.0	0.0		0.0

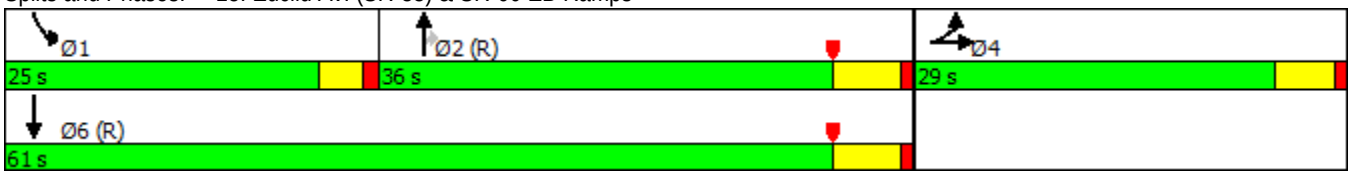
Intersection Summary	
HCM 2010 Ctrl Delay	59.8
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	337	0	1084	643	299	1490
Future Volume (vph)	337	0	1084	643	299	1490
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	31.7	31.7	19.8	55.5
Actuated g/C Ratio	0.27	0.27	0.35	0.35	0.22	0.62
v/c Ratio	0.79	1.56	0.96	0.72	0.90	0.75
Control Delay	46.5	289.7	47.4	7.2	48.2	6.0
Queue Delay	4.5	0.9	0.0	0.0	0.0	3.2
Total Delay	51.0	290.6	47.4	7.2	48.2	9.2
LOS	D	F	D	A	D	A
Approach Delay		215.0	32.4			15.8
Approach LOS		F	C			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.56	
Intersection Signal Delay: 65.0	Intersection LOS: E
Intersection Capacity Utilization 135.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	337	0	625	0	0	0	0	1084	643	299	1490	0
Future Volume (veh/h)	337	0	625	0	0	0	0	1084	643	299	1490	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	359	0	582				0	1153	684	318	1585	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	432	0	408				0	1226	546	346	2109	0
Arrive On Green	0.27	0.00	0.27				0.00	0.36	0.36	0.28	0.82	0.00
Sat Flow, veh/h	1619	0	1530				0	3510	1521	1619	3510	0
Grp Volume(v), veh/h	359	0	582				0	1153	684	318	1585	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1521	1619	1710	0
Q Serve(g_s), s	18.8	0.0	24.0				0.0	29.4	32.3	17.1	19.6	0.0
Cycle Q Clear(g_c), s	18.8	0.0	24.0				0.0	29.4	32.3	17.1	19.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	408				0	1226	546	346	2109	0
V/C Ratio(X)	0.83	0.00	1.43				0.00	0.94	1.25	0.92	0.75	0.00
Avail Cap(c_a), veh/h	432	0	408				0	1226	546	378	2109	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.73	0.73	0.15	0.15	0.00
Uniform Delay (d), s/veh	31.1	0.0	33.0				0.0	27.9	28.9	31.5	4.9	0.0
Incr Delay (d2), s/veh	12.2	0.0	205.7				0.0	11.7	125.0	5.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	0.0	33.4				0.0	15.8	32.4	8.1	8.8	0.0
LnGrp Delay(d),s/veh	43.3	0.0	238.7				0.0	39.6	153.9	36.8	5.2	0.0
LnGrp LOS	D		F					D	F	D	A	
Approach Vol, veh/h		941						1837			1903	
Approach Delay, s/veh		164.1						82.2			10.5	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.2	37.8		29.0		61.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	19.1	34.3		26.0		21.6		
Green Ext Time (p_c), s	0.1	0.0		0.0		32.3		

Intersection Summary	
HCM 2010 Ctrl Delay	69.5
HCM 2010 LOS	E

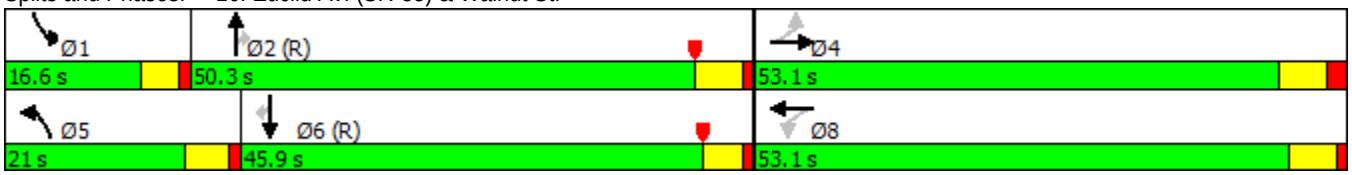
Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	152	339	90	313	115	1378	54	160	1674	58
Future Volume (vph)	152	339	90	313	115	1378	54	160	1674	58
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	34.3	34.3	35.3	35.3	13.5	59.0	59.0	10.6	56.6	56.6
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.11	0.49	0.49	0.09	0.47	0.47
v/c Ratio	0.99	0.49	0.50	0.50	0.67	0.60	0.07	0.64	0.76	0.08
Control Delay	110.9	32.6	41.6	27.7	56.3	23.8	5.9	64.2	31.4	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.9	32.6	41.6	27.7	56.3	23.8	5.9	64.2	31.4	5.0
LOS	F	C	D	C	E	C	A	E	C	A
Approach Delay		52.4		29.9		25.6			33.4	
Approach LOS		D		C		C			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 32.8 — Intersection LOS: C
Intersection Capacity Utilization 84.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	339	108	90	313	175	115	1378	54	160	1674	58
Future Volume (veh/h)	152	339	108	90	313	175	115	1378	54	160	1674	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	160	357	92	95	329	151	121	1451	38	168	1762	32
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	261	925	235	277	782	351	146	2213	689	216	2112	657
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.03	0.15	0.15	0.07	0.43	0.43
Sat Flow, veh/h	877	2701	687	903	2283	1025	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	160	224	225	95	245	235	121	1451	38	168	1762	32
Grp Sat Flow(s),veh/h/ln	877	1710	1678	903	1710	1598	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	20.7	11.9	12.2	10.7	13.2	13.6	8.9	33.4	2.6	6.7	38.3	1.5
Cycle Q Clear(g_c), s	34.3	11.9	12.2	22.9	13.2	13.6	8.9	33.4	2.6	6.7	38.3	1.5
Prop In Lane	1.00		0.41	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	586	575	277	586	547	146	2213	689	216	2112	657
V/C Ratio(X)	0.61	0.38	0.39	0.34	0.42	0.43	0.83	0.66	0.06	0.78	0.83	0.05
Avail Cap(c_a), veh/h	302	667	654	328	681	637	217	2213	689	298	2112	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.45	0.45	0.45	0.58	0.58	0.58
Uniform Delay (d), s/veh	43.6	29.9	30.0	38.6	30.3	30.4	57.3	42.3	29.2	54.7	30.4	19.9
Incr Delay (d2), s/veh	2.8	0.4	0.4	0.7	0.5	0.5	7.3	0.7	0.1	3.2	2.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.7	5.7	2.7	6.3	6.1	4.3	15.3	1.1	2.8	17.8	0.6
LnGrp Delay(d),s/veh	46.5	30.3	30.4	39.4	30.7	31.0	64.6	43.0	29.2	57.9	32.8	20.0
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	C	C
Approach Vol, veh/h		609			575			1610			1962	
Approach Delay, s/veh		34.6			32.3			44.3			34.8	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.3	59.3		47.4	15.7	56.9		47.4
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	8.7	35.4		36.3	10.9	40.3		24.9
Green Ext Time (p_c), s	0.1	8.7		4.8	0.1	1.1		7.0

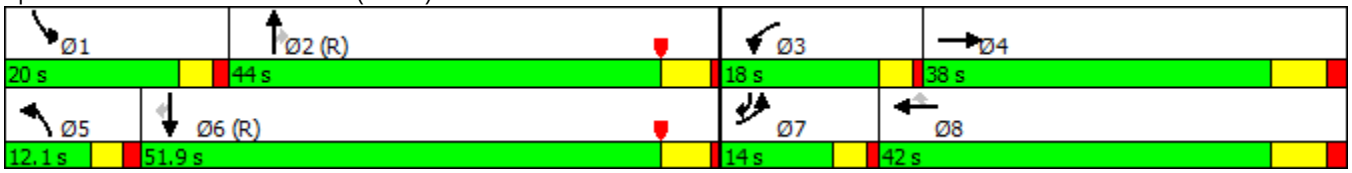
Intersection Summary			
HCM 2010 Ctrl Delay		37.7	
HCM 2010 LOS		D	

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	330	177	388	51	63	974	172	182	1086	150
Future Volume (vph)	145	330	177	388	51	63	974	172	182	1086	150
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	38.0	18.0	42.0	42.0	12.1	44.0	44.0	20.0	51.9	14.0
Total Split (%)	11.7%	31.7%	15.0%	35.0%	35.0%	10.1%	36.7%	36.7%	16.7%	43.3%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.4	21.1	14.7	24.4	24.4	9.6	43.5	43.5	19.6	55.7	72.7
Actuated g/C Ratio	0.10	0.18	0.12	0.20	0.20	0.08	0.36	0.36	0.16	0.46	0.61
v/c Ratio	1.00	0.67	0.94	0.59	0.13	0.51	0.83	0.28	0.73	0.72	0.16
Control Delay	127.6	49.7	103.4	45.9	0.6	87.3	27.6	3.4	82.3	10.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.6	49.7	103.4	45.9	0.6	87.3	27.6	3.4	82.3	10.8	0.3
LOS	F	D	F	D	A	F	C	A	F	B	A
Approach Delay		71.1		58.6			27.2			18.9	
Approach LOS		E		E			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	330	54	177	388	51	63	974	172	182	1086	150
Future Volume (veh/h)	145	330	54	177	388	51	63	974	172	182	1086	150
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	153	347	34	186	408	49	66	1025	100	192	1143	92
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	538	52	189	700	312	82	1395	624	209	1664	872
Arrive On Green	0.08	0.17	0.17	0.12	0.20	0.20	0.07	0.54	0.54	0.26	0.97	0.97
Sat Flow, veh/h	1619	3144	306	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	153	188	193	186	408	49	66	1025	100	192	1143	92
Grp Sat Flow(s),veh/h/ln	1619	1710	1741	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	10.0	12.3	12.4	13.8	12.9	3.2	4.8	27.4	3.9	13.8	3.3	0.2
Cycle Q Clear(g_c), s	10.0	12.3	12.4	13.8	12.9	3.2	4.8	27.4	3.9	13.8	3.3	0.2
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	293	298	189	700	312	82	1395	624	209	1664	872
V/C Ratio(X)	1.13	0.64	0.65	0.98	0.58	0.16	0.81	0.73	0.16	0.92	0.69	0.11
Avail Cap(c_a), veh/h	135	442	450	189	998	446	103	1395	624	209	1664	872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.69	0.69	0.69	0.58	0.58	0.58
Uniform Delay (d), s/veh	55.0	46.3	46.4	52.9	43.1	39.2	55.4	22.5	17.1	43.9	0.9	0.6
Incr Delay (d2), s/veh	118.0	3.3	3.4	60.7	1.1	0.3	22.1	2.4	0.4	27.9	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	6.1	6.2	9.3	6.2	1.4	2.7	13.2	1.7	7.8	0.9	0.1
LnGrp Delay(d),s/veh	173.0	49.6	49.7	113.6	44.2	39.6	77.5	24.9	17.5	71.8	2.2	0.7
LnGrp LOS	F	D	D	F	D	D	E	C	B	E	A	A
Approach Vol, veh/h		534			643			1191			1427	
Approach Delay, s/veh		85.0			63.9			27.2			11.5	
Approach LOS		F			E			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.5	18.0	27.5	10.6	63.9	14.0	31.5
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	38.5	14.0	31.0	7.6	46.4	10.0	35.0
Max Q Clear Time (g_c+I1), s	15.8	29.4	15.8	14.4	6.8	5.3	12.0	14.9
Green Ext Time (p_c), s	0.0	7.6	0.0	5.9	0.0	22.8	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	35.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	101	123	66	63	161	70	1344	137	29	1681	98
Future Volume (vph)	101	123	66	63	161	70	1344	137	29	1681	98
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	25.9	25.9	25.9		25.9	9.9	74.2	74.2	6.9	69.6	69.6
Actuated g/C Ratio	0.22	0.22	0.22		0.22	0.08	0.62	0.62	0.06	0.58	0.58
v/c Ratio	0.68	0.33	0.17		0.81	0.56	0.67	0.15	0.33	0.89	0.11
Control Delay	62.8	40.5	4.4		61.7	66.7	18.3	4.2	48.6	44.7	13.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	40.5	4.4		61.7	66.7	18.3	4.2	48.6	44.7	13.1
LOS	E	D	A		E	E	B	A	D	D	B
Approach Delay		40.1			61.7		19.3			43.0	
Approach LOS		D			E		B			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 34.6	Intersection LOS: C
Intersection Capacity Utilization 95.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	123	66	63	161	36	70	1344	137	29	1681	98
Future Volume (veh/h)	101	123	66	63	161	36	70	1344	137	29	1681	98
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	106	129	45	66	169	34	74	1415	108	31	1769	74
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	202	403	338	101	222	41	91	2092	936	43	1991	890
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.11	1.00	1.00	0.02	0.39	0.39
Sat Flow, veh/h	1131	1800	1510	285	989	184	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	106	129	45	269	0	0	74	1415	108	31	1769	74
Grp Sat Flow(s),veh/h/ln	1131	1800	1510	1458	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	1.1	7.2	2.9	14.4	0.0	0.0	5.4	0.0	0.0	2.3	57.9	3.7
Cycle Q Clear(g_c), s	22.7	7.2	2.9	21.6	0.0	0.0	5.4	0.0	0.0	2.3	57.9	3.7
Prop In Lane	1.00		1.00	0.25		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	202	403	338	364	0	0	91	2092	936	43	1991	890
V/C Ratio(X)	0.53	0.32	0.13	0.74	0.00	0.00	0.81	0.68	0.12	0.71	0.89	0.08
Avail Cap(c_a), veh/h	297	555	466	498	0	0	169	2092	936	101	1991	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.55	0.55	0.55	0.56	0.56	0.56
Uniform Delay (d), s/veh	45.5	38.9	37.2	45.0	0.0	0.0	52.6	0.0	0.0	58.5	33.0	16.4
Incr Delay (d2), s/veh	2.1	0.5	0.2	3.8	0.0	0.0	3.6	1.0	0.1	4.5	3.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	3.6	1.2	8.9	0.0	0.0	2.5	0.3	0.0	1.1	28.4	1.6
LnGrp Delay(d),s/veh	47.6	39.4	37.4	48.8	0.0	0.0	56.2	1.0	0.1	63.0	36.7	16.5
LnGrp LOS	D	D	D	D			E	A	A	E	D	B
Approach Vol, veh/h		280			269			1597			1874	
Approach Delay, s/veh		42.2			48.8			3.5			36.4	
Approach LOS		D			D			A			D	

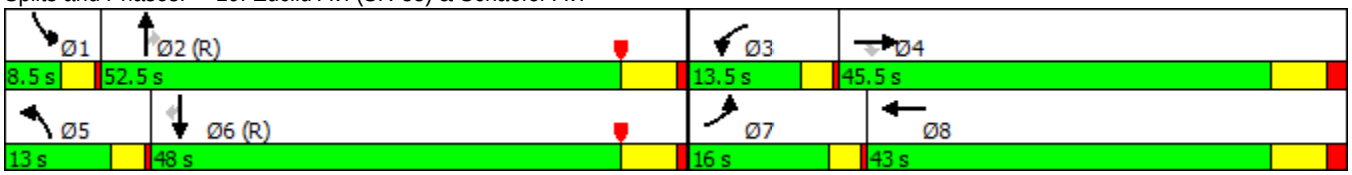
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	79.4		33.9	10.3	75.9		33.9
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.3	2.0		24.7	7.4	59.9		23.6
Green Ext Time (p_c), s	0.0	44.5		2.2	0.0	0.0		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	24.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	61	117	57	119	119	1421	21	15	1634	132
Future Volume (vph)	139	61	117	57	119	119	1421	21	15	1634	132
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.3	22.5	22.5	10.0	17.6	14.5	70.0	70.0	5.4	55.7	55.7
Actuated g/C Ratio	0.10	0.19	0.19	0.08	0.15	0.12	0.58	0.58	0.04	0.46	0.46
v/c Ratio	0.90	0.19	0.32	0.46	0.55	0.65	0.76	0.02	0.22	1.10	0.18
Control Delay	101.1	40.7	8.1	63.9	51.3	43.3	31.9	1.2	61.7	82.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.1	40.7	8.1	63.9	51.3	43.3	31.9	1.2	61.7	82.7	8.4
LOS	F	D	A	E	D	D	C	A	E	F	A
Approach Delay		55.2			55.1		32.4			77.0	
Approach LOS		E			E		C			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 56.0	Intersection LOS: E
Intersection Capacity Utilization 88.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	61	117	57	119	17	119	1421	21	15	1634	132
Future Volume (veh/h)	139	61	117	57	119	17	119	1421	21	15	1634	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	148	65	72	61	127	16	127	1512	17	16	1738	92
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	169	244	207	117	163	20	128	2080	931	28	1868	816
Arrive On Green	0.10	0.14	0.14	0.07	0.10	0.10	0.03	0.20	0.20	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1568	197	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	148	65	72	61	0	143	127	1512	17	16	1738	92
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1765	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	10.8	3.9	5.1	4.4	0.0	9.5	9.4	49.6	1.1	1.2	60.1	6.2
Cycle Q Clear(g_c), s	10.8	3.9	5.1	4.4	0.0	9.5	9.4	49.6	1.1	1.2	60.1	6.2
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	244	207	117	0	183	128	2080	931	28	1868	816
V/C Ratio(X)	0.88	0.27	0.35	0.52	0.00	0.78	0.99	0.73	0.02	0.57	0.93	0.11
Avail Cap(c_a), veh/h	169	578	491	135	0	530	128	2080	931	67	1868	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.29	0.29	0.29	0.38	0.38	0.38
Uniform Delay (d), s/veh	53.0	46.5	47.1	53.6	0.0	52.5	58.4	38.6	19.2	59.2	46.9	24.8
Incr Delay (d2), s/veh	35.9	0.4	0.7	1.3	0.0	5.3	40.2	0.7	0.0	2.6	4.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	2.0	2.2	2.0	0.0	4.9	5.7	23.8	0.5	0.6	29.6	2.6
LnGrp Delay(d),s/veh	88.9	47.0	47.8	55.0	0.0	57.8	98.6	39.3	19.2	61.8	51.2	25.0
LnGrp LOS	F	D	D	D		E	F	D	B	E	D	C
Approach Vol, veh/h		285			204			1656			1846	
Approach Delay, s/veh		68.9			57.0			43.6			50.0	
Approach LOS		E			E			D			D	

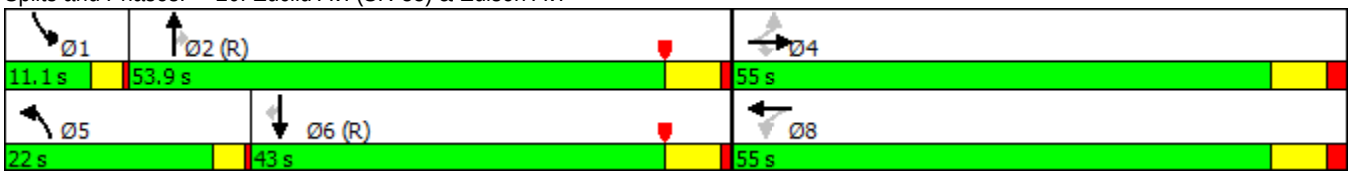
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	79.0	12.2	23.2	13.0	71.6	16.0	19.4
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	51.6	6.4	7.1	11.4	62.1	12.8	11.5
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	214	166	227	67	342	247	1273	36	41	1479	247
Future Volume (vph)	214	166	227	67	342	247	1273	36	41	1479	247
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	45.5	45.5	45.5	45.5	45.5	20.6	52.9	52.9	6.8	37.4	37.4
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.17	0.44	0.44	0.06	0.31	0.31
v/c Ratio	1.00	0.26	0.33	0.18	0.60	0.95	0.90	0.05	0.48	1.47	0.48
Control Delay	96.0	26.1	4.2	25.0	33.3	82.1	44.6	4.9	83.0	234.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.0	26.1	4.2	25.0	33.3	82.1	44.6	4.9	83.0	234.7	3.0
LOS	F	C	A	C	C	F	D	A	F	F	A
Approach Delay		42.6			32.0		49.6			198.7	
Approach LOS		D			C		D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.47	
Intersection Signal Delay: 107.0	Intersection LOS: F
Intersection Capacity Utilization 113.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	214	166	227	67	342	39	247	1273	36	41	1479	247
Future Volume (veh/h)	214	166	227	67	342	39	247	1273	36	41	1479	247
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	228	177	174	71	364	39	263	1354	23	44	1573	232
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	270	720	612	391	639	69	250	1467	656	54	1054	471
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.21	0.57	0.57	0.07	0.62	0.62
Sat Flow, veh/h	942	1800	1530	988	1598	171	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	228	177	174	71	0	403	263	1354	23	44	1573	232
Grp Sat Flow(s),veh/h/ln	942	1800	1530	988	0	1770	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	26.8	7.9	9.2	6.2	0.0	21.2	18.5	43.1	0.8	3.2	37.0	10.0
Cycle Q Clear(g_c), s	48.0	7.9	9.2	14.0	0.0	21.2	18.5	43.1	0.8	3.2	37.0	10.0
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	720	612	391	0	708	250	1467	656	54	1055	471
V/C Ratio(X)	0.84	0.25	0.28	0.18	0.00	0.57	1.05	0.92	0.04	0.81	1.49	0.49
Avail Cap(c_a), veh/h	270	720	612	391	0	708	250	1467	656	103	1055	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	0.09	0.09	0.09
Uniform Delay (d), s/veh	47.7	24.0	24.4	28.6	0.0	28.0	47.7	24.0	14.9	55.6	23.0	17.8
Incr Delay (d2), s/veh	21.0	0.2	0.3	0.2	0.0	1.1	64.5	8.9	0.1	1.0	221.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	3.9	4.0	1.7	0.0	10.5	12.7	21.9	0.3	1.5	49.5	4.2
LnGrp Delay(d),s/veh	68.7	24.1	24.6	28.8	0.0	29.1	112.2	32.8	15.0	56.6	244.7	18.2
LnGrp LOS	E	C	C	C		C	F	C	B	E	F	B
Approach Vol, veh/h		579			474			1640			1849	
Approach Delay, s/veh		41.8			29.0			45.3			211.8	
Approach LOS		D			C			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	57.5		55.0	22.0	43.0		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.2	45.1		50.0	20.5	39.0		23.2
Green Ext Time (p_c), s	0.0	2.7		0.0	0.0	0.0		5.7

Intersection Summary		
HCM 2010 Ctrl Delay		111.0
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	54	7	206	21	44	176	1478	7	21	1718	27
Future Volume (vph)	54	7	206	21	44	176	1478	7	21	1718	27
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	50.3	50.3	50.3	50.3	50.3	21.0	60.0	60.0	9.7	48.7	48.7
Total Split (%)	41.9%	41.9%	41.9%	41.9%	41.9%	17.5%	50.0%	50.0%	8.1%	40.6%	40.6%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.8	15.8	15.8	15.8	15.8	18.0	87.0	87.0	6.7	72.2	72.2
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.15	0.72	0.72	0.06	0.60	0.60
v/c Ratio	0.35	0.03	0.56	0.13	0.31	0.76	0.62	0.01	0.24	0.87	0.03
Control Delay	48.8	36.6	10.2	41.0	28.8	61.4	9.6	0.0	72.6	16.3	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	36.6	10.2	41.0	28.8	61.4	9.6	0.0	72.6	16.3	1.6
LOS	D	D	B	D	C	E	A	A	E	B	A
Approach Delay		18.7			31.5		15.0			16.8	
Approach LOS		B			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 83.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	7	206	21	44	31	176	1478	7	21	1718	27
Future Volume (veh/h)	54	7	206	21	44	31	176	1478	7	21	1718	27
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	56	7	129	22	46	25	183	1540	7	22	1790	24
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	145	190	162	183	116	63	207	2585	1157	35	2222	972
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.13	0.76	0.76	0.01	0.21	0.21
Sat Flow, veh/h	1275	1800	1530	1202	1098	597	1619	3420	1530	1619	3420	1497
Grp Volume(v), veh/h	56	7	129	22	0	71	183	1540	7	22	1790	24
Grp Sat Flow(s),veh/h/ln	1275	1800	1530	1202	0	1695	1619	1710	1530	1619	1710	1497
Q Serve(g_s), s	5.1	0.4	9.9	2.0	0.0	4.7	13.3	24.0	0.1	1.6	59.6	1.5
Cycle Q Clear(g_c), s	9.8	0.4	9.9	2.4	0.0	4.7	13.3	24.0	0.1	1.6	59.6	1.5
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	190	162	183	0	179	207	2585	1157	35	2222	972
V/C Ratio(X)	0.39	0.04	0.80	0.12	0.00	0.40	0.88	0.60	0.01	0.63	0.81	0.02
Avail Cap(c_a), veh/h	494	683	580	512	0	643	236	2585	1157	84	2222	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.7	48.2	52.4	49.3	0.0	50.1	51.4	6.5	3.6	59.1	39.9	17.1
Incr Delay (d2), s/veh	1.2	0.1	6.6	0.2	0.0	1.1	26.9	1.0	0.0	1.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	4.5	0.7	0.0	2.3	7.5	11.5	0.1	0.7	28.4	0.6
LnGrp Delay(d),s/veh	55.9	48.2	59.0	49.5	0.0	51.1	78.3	7.5	3.6	60.3	40.3	17.1
LnGrp LOS	E	D	E	D		D	E	A	A	E	D	B
Approach Vol, veh/h		192			93			1730			1836	
Approach Delay, s/veh		57.7			50.7			15.0			40.2	
Approach LOS		E			D			B			D	

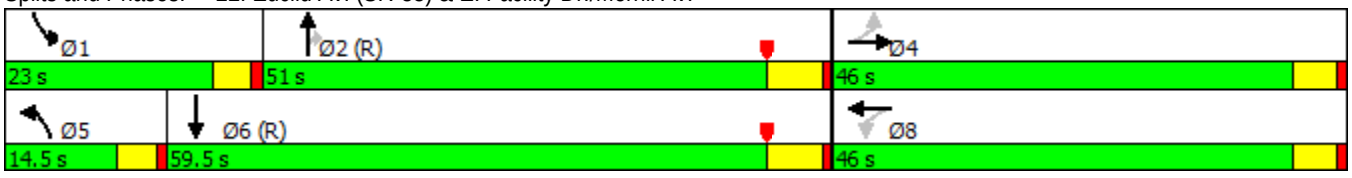
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	96.4		17.5	18.9	83.6		17.5
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	54.3		45.5	17.5	43.0		45.5
Max Q Clear Time (g_c+I1), s	3.6	26.0		11.9	15.3	61.6		6.7
Green Ext Time (p_c), s	0.0	25.1		0.8	0.1	0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	30.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	379	47	19	1046	179	475	1463
Future Volume (vph)	8	6	379	47	19	1046	179	475	1463
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	51.0	51.0	23.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	42.5%	42.5%	19.2%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	10.0	45.0	45.0	18.5	62.2
Actuated g/C Ratio		0.34		0.34	0.08	0.38	0.38	0.15	0.52
v/c Ratio		0.04		2.02	0.15	0.85	0.29	2.00	0.89
Control Delay		22.6		489.4	60.8	26.8	9.3	483.4	26.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.6		489.4	60.8	26.8	9.3	483.4	26.5
LOS		C		F	E	C	A	F	C
Approach Delay		22.6		489.4		24.8			136.1
Approach LOS		C		F		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.02	
Intersection Signal Delay: 188.5	Intersection LOS: F
Intersection Capacity Utilization 143.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	379	47	606	19	1046	179	475	1463	43
Future Volume (veh/h)	8	6	4	379	47	606	19	1046	179	475	1463	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	395	49	585	20	1090	160	495	1524	42
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	201	144	64	237	24	290	66	1282	574	250	1661	46
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.04	0.38	0.38	0.15	0.49	0.49
Sat Flow, veh/h	458	422	189	573	71	849	1619	3420	1530	1619	3400	94
Grp Volume(v), veh/h	17	0	0	1029	0	0	20	1090	160	495	765	801
Grp Sat Flow(s),veh/h/ln	1069	0	0	1494	0	0	1619	1710	1530	1619	1710	1783
Q Serve(g_s), s	0.0	0.0	0.0	40.2	0.0	0.0	1.4	35.1	8.8	18.5	49.7	50.0
Cycle Q Clear(g_c), s	0.8	0.0	0.0	41.0	0.0	0.0	1.4	35.1	8.8	18.5	49.7	50.0
Prop In Lane	0.47		0.18	0.38		0.57	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	409	0	0	552	0	0	66	1283	574	250	836	871
V/C Ratio(X)	0.04	0.00	0.00	1.86	0.00	0.00	0.30	0.85	0.28	1.98	0.92	0.92
Avail Cap(c_a), veh/h	409	0	0	552	0	0	135	1283	574	250	836	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.3	0.0	0.0	41.0	0.0	0.0	55.9	34.4	26.2	50.8	28.4	28.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	396.0	0.0	0.0	0.1	0.7	0.1	456.5	16.4	16.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	78.9	0.0	0.0	0.6	16.6	3.7	39.9	27.2	28.4
LnGrp Delay(d),s/veh	26.3	0.0	0.0	437.0	0.0	0.0	56.0	35.1	26.3	507.3	44.8	44.7
LnGrp LOS	C			F			E	D	C	F	D	D
Approach Vol, veh/h		17			1029			1270			2061	
Approach Delay, s/veh		26.3			437.0			34.3			155.8	
Approach LOS		C			F			C			F	

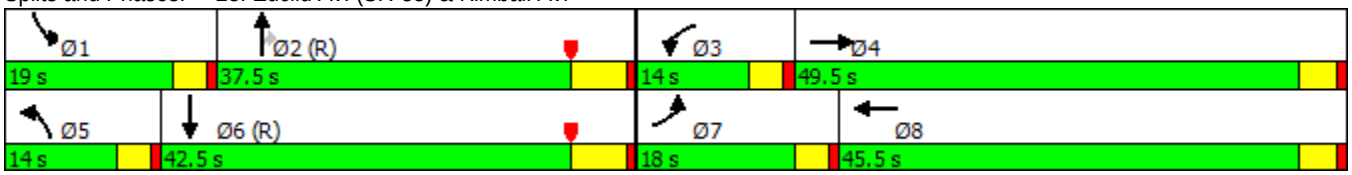
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	51.0		46.0	9.4	64.6		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	45.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	20.5	37.1		2.8	3.4	52.0		43.0
Green Ext Time (p_c), s	0.0	7.1		6.1	0.0	1.4		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		186.2
HCM 2010 LOS		F

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	274	358	130	588	172	771	198	393	716
Future Volume (vph)	274	358	130	588	172	771	198	393	716
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	14.0	35.9	10.0	31.9	19.1	31.5	31.5	24.1	36.5
Actuated g/C Ratio	0.12	0.30	0.08	0.27	0.16	0.26	0.26	0.20	0.30
v/c Ratio	1.49	0.40	0.99	0.83	0.69	0.88	0.37	1.24	1.24
Control Delay	283.4	32.8	131.2	48.0	45.2	43.2	10.9	156.8	133.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	283.4	32.8	131.2	48.0	45.2	43.2	10.9	156.8	133.0
LOS	F	C	F	D	D	D	B	F	F
Approach Delay		134.3		60.5		37.9			138.4
Approach LOS		F		E		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.49	
Intersection Signal Delay: 96.5	Intersection LOS: F
Intersection Capacity Utilization 106.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	358	45	130	588	144	172	771	198	393	716	614
Future Volume (veh/h)	274	358	45	130	588	144	172	771	198	393	716	614
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	280	365	44	133	600	125	176	787	194	401	731	589
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	189	883	106	135	716	149	135	1198	536	202	709	560
Arrive On Green	0.12	0.29	0.29	0.08	0.25	0.25	0.03	0.12	0.12	0.13	0.39	0.39
Sat Flow, veh/h	1619	3077	368	1619	2820	586	1619	3420	1530	1619	1807	1429
Grp Volume(v), veh/h	280	202	207	133	363	362	176	787	194	401	691	629
Grp Sat Flow(s),veh/h/ln	1619	1710	1735	1619	1710	1697	1619	1710	1530	1619	1710	1526
Q Serve(g_s), s	14.0	11.4	11.6	9.8	24.2	24.3	10.0	26.4	14.0	15.0	47.1	47.1
Cycle Q Clear(g_c), s	14.0	11.4	11.6	9.8	24.2	24.3	10.0	26.4	14.0	15.0	47.1	47.1
Prop In Lane	1.00		0.21	1.00		0.35	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	189	491	498	135	434	430	135	1198	536	202	670	598
V/C Ratio(X)	1.48	0.41	0.42	0.99	0.84	0.84	1.30	0.66	0.36	1.98	1.03	1.05
Avail Cap(c_a), veh/h	189	641	651	135	584	580	135	1198	536	202	670	598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	0.32	0.32	0.32	0.31	0.31	0.31
Uniform Delay (d), s/veh	53.0	34.6	34.6	54.9	42.4	42.5	58.4	46.2	40.7	52.5	36.5	36.5
Incr Delay (d2), s/veh	241.0	0.5	0.5	72.8	6.0	6.2	153.5	0.9	0.6	447.1	27.7	35.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.9	5.4	5.7	7.1	12.1	12.1	10.2	12.7	6.1	31.8	27.3	25.7
LnGrp Delay(d),s/veh	294.0	35.1	35.1	127.7	48.4	48.7	211.8	47.1	41.3	499.6	64.1	71.8
LnGrp LOS	F	D	D	F	D	D	F	D	D	F	F	F
Approach Vol, veh/h		689			858			1157			1721	
Approach Delay, s/veh		140.3			60.8			71.2			168.4	
Approach LOS		F			E			E			F	

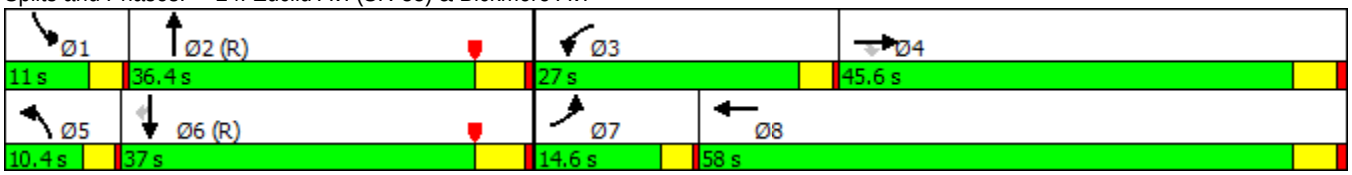
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	48.1	14.0	38.9	14.0	53.1	18.0	34.9
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	28.4	11.8	13.6	12.0	49.1	16.0	26.3
Green Ext Time (p_c), s	0.0	2.7	0.0	5.0	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	117.8
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	85	28	51	282	403	79	773	74	676	110
Future Volume (vph)	85	28	51	282	403	79	773	74	676	110
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.8	32.6	32.6	29.7	50.5	8.0	34.4	7.8	34.2	34.2
Actuated g/C Ratio	0.08	0.27	0.27	0.25	0.42	0.07	0.29	0.06	0.28	0.28
v/c Ratio	0.69	0.06	0.11	0.75	0.95	0.78	0.92	0.76	0.74	0.23
Control Delay	79.3	27.5	0.5	57.7	55.6	41.0	36.8	60.8	21.9	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	27.5	0.5	57.7	55.6	41.0	36.8	60.8	21.9	4.8
LOS	E	C	A	E	E	D	D	E	C	A
Approach Delay		45.9			56.2		37.1		23.1	
Approach LOS		D			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 39.7	Intersection LOS: D
Intersection Capacity Utilization 88.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	28	51	282	403	254	79	773	67	74	676	110
Future Volume (veh/h)	85	28	51	282	403	254	79	773	67	74	676	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	90	30	52	300	429	257	84	822	70	79	719	108
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	110	530	450	317	446	267	93	968	82	98	1048	469
Arrive On Green	0.07	0.29	0.29	0.20	0.42	0.42	0.02	0.10	0.10	0.02	0.10	0.10
Sat Flow, veh/h	1619	1800	1528	1619	1056	633	1619	3190	272	1619	3420	1530
Grp Volume(v), veh/h	90	30	52	300	0	686	84	441	451	79	719	108
Grp Sat Flow(s),veh/h/ln	1619	1800	1528	1619	0	1688	1619	1710	1752	1619	1710	1530
Q Serve(g_s), s	6.6	1.4	3.0	21.9	0.0	47.5	6.2	30.4	30.4	5.8	24.4	7.8
Cycle Q Clear(g_c), s	6.6	1.4	3.0	21.9	0.0	47.5	6.2	30.4	30.4	5.8	24.4	7.8
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	110	530	450	317	0	713	93	519	532	98	1048	469
V/C Ratio(X)	0.82	0.06	0.12	0.95	0.00	0.96	0.90	0.85	0.85	0.81	0.69	0.23
Avail Cap(c_a), veh/h	150	609	517	317	0	746	93	519	532	101	1048	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.2	30.4	30.9	47.6	0.0	33.8	58.5	51.3	51.3	58.1	48.4	40.9
Incr Delay (d2), s/veh	16.1	0.0	0.0	36.1	0.0	23.3	10.6	1.7	1.7	3.9	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.7	1.3	13.0	0.0	26.7	3.1	14.6	15.0	2.7	11.6	3.3
LnGrp Delay(d),s/veh	71.3	30.4	31.0	83.7	0.0	57.0	69.1	53.0	53.0	62.0	48.7	41.0
LnGrp LOS	E	C	C	F		E	E	D	D	E	D	D
Approach Vol, veh/h		172			986			976			906	
Approach Delay, s/veh		52.0			65.1			54.4			48.9	
Approach LOS		D			E			D			D	

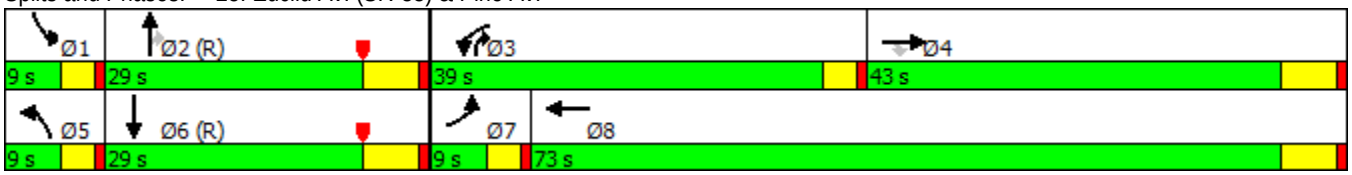
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	41.9	27.0	40.3	10.4	42.3	11.7	55.7
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	7.8	32.4	23.9	5.0	8.2	26.4	8.6	49.5
Green Ext Time (p_c), s	0.0	0.0	0.0	3.3	0.0	2.9	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	56.1
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	218	33	879	166	58	892	496	84	904
Future Volume (vph)	5	218	33	879	166	58	892	496	84	904
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	22.8	22.8	35.0	60.0	8.4	29.6	66.6	12.6	33.8
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.25	0.56	0.10	0.28
v/c Ratio	0.07	0.65	0.08	1.03	0.31	0.52	1.07	0.49	0.50	0.97
Control Delay	57.8	52.5	0.4	81.2	15.2	61.8	96.5	3.1	65.9	47.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.5	0.4	81.2	15.2	61.8	96.5	3.1	65.9	47.4
LOS	E	D	A	F	B	E	F	A	E	D
Approach Delay		45.9			65.9		63.1			49.0
Approach LOS		D			E		E			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 59.1	Intersection LOS: E
Intersection Capacity Utilization 89.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	218	33	879	166	100	58	892	496	84	904	15
Future Volume (veh/h)	5	218	33	879	166	100	58	892	496	84	904	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	220	0	888	168	86	59	901	323	85	913	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	293	249	862	501	257	67	1153	950	67	1168	13
Arrive On Green	0.01	0.16	0.00	0.29	0.45	0.45	0.04	0.34	0.34	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1118	572	1619	3420	1496	1619	3464	38
Grp Volume(v), veh/h	5	220	0	888	0	254	59	901	323	85	451	472
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1690	1619	1710	1496	1619	1710	1792
Q Serve(g_s), s	0.4	14.0	0.0	35.0	0.0	11.7	4.3	28.5	12.3	5.0	30.8	30.8
Cycle Q Clear(g_c), s	0.4	14.0	0.0	35.0	0.0	11.7	4.3	28.5	12.3	5.0	30.8	30.8
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	10	293	249	862	0	758	67	1153	950	67	576	604
V/C Ratio(X)	0.48	0.75	0.00	1.03	0.00	0.34	0.87	0.78	0.34	1.26	0.78	0.78
Avail Cap(c_a), veh/h	67	555	472	862	0	944	67	1153	950	67	576	604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.30	0.30	0.30	0.64	0.64	0.64
Uniform Delay (d), s/veh	59.4	47.9	0.0	42.5	0.0	21.5	57.2	35.8	10.6	59.2	49.0	49.0
Incr Delay (d2), s/veh	12.4	5.4	0.0	38.6	0.0	0.4	28.4	1.6	0.3	172.7	6.7	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.4	0.0	18.9	0.0	5.5	2.5	13.7	5.1	5.5	15.7	16.4
LnGrp Delay(d),s/veh	71.8	53.3	0.0	81.1	0.0	21.9	85.6	37.4	10.8	231.9	55.7	55.4
LnGrp LOS	E	D		F		C	F	D	B	F	E	E
Approach Vol, veh/h		225			1142			1283			1008	
Approach Delay, s/veh		53.7			67.9			33.0			70.4	
Approach LOS		D			E			C			E	

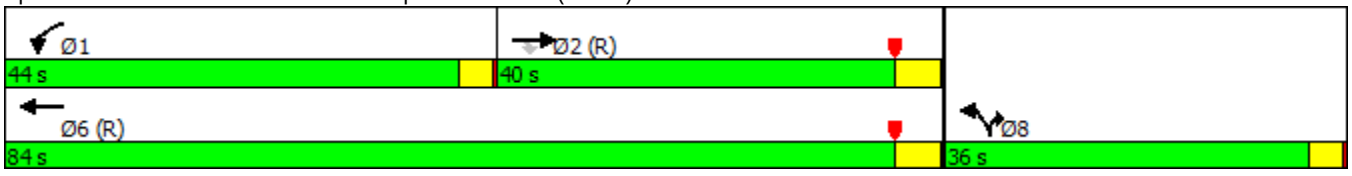
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	46.4	39.0	25.6	9.0	46.4	4.8	59.8
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	7.0	30.5	37.0	16.0	6.3	32.8	2.4	13.7
Green Ext Time (p_c), s	0.0	0.0	0.0	3.6	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	55.5
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	540	300	590	1218	72	942
Future Volume (vph)	540	300	590	1218	72	942
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	40.0	40.0	44.0	84.0	36.0	36.0
Total Split (%)	33.3%	33.3%	36.7%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	35.5	35.5	40.5	79.5	32.5	32.5
Actuated g/C Ratio	0.30	0.30	0.34	0.66	0.27	0.27
v/c Ratio	0.56	0.47	1.07	0.56	0.08	1.13
Control Delay	59.5	25.6	79.4	1.0	33.1	89.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	25.6	79.4	1.0	33.1	89.5
LOS	E	C	E	A	C	F
Approach Delay	47.4			26.6	85.5	
Approach LOS	D			C	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 47.7	Intersection LOS: D
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	540	300	590	1218	72	942
Future Volume (veh/h)	540	300	590	1218	72	942
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	562	0	615	1269	75	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1796	803	579	3050	139	64
Arrive On Green	1.00	0.00	0.34	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	562	0	615	1269	75	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	40.5	7.7	2.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	40.5	7.7	2.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1796	803	579	3050	139	64
V/C Ratio(X)	0.31	0.00	1.06	0.42	0.54	0.00
Avail Cap(c_a), veh/h	1796	803	579	3050	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.13	0.13	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	39.8	1.1	56.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	34.1	0.1	3.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	24.6	3.5	1.3	0.0
LnGrp Delay(d),s/veh	0.5	0.0	73.9	1.2	59.6	0.0
LnGrp LOS	A		F	A	E	
Approach Vol, veh/h	562			1884	75	
Approach Delay, s/veh	0.5			24.9	59.6	
Approach LOS	A			C	E	

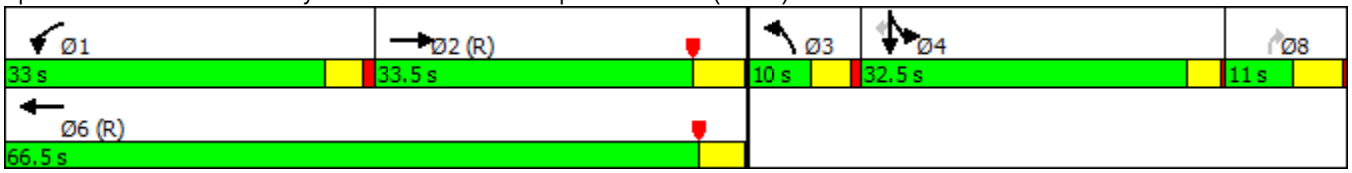
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	44.0	67.5				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	40.5	35.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	42.5	2.0				9.7		4.7
Green Ext Time (p_c), s	0.0	13.1				15.3		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.5
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	804	396	243	62	300	271	21	36
Future Volume (vph)	804	396	243	62	300	271	21	36
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	33.5	33.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	27.9%	27.5%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	28.5	37.5	71.0	5.5	7.3	18.7	18.7	18.7
Actuated g/C Ratio	0.24	0.31	0.59	0.05	0.06	0.16	0.16	0.16
v/c Ratio	1.11	0.86	0.13	0.92	0.82	0.67	0.62	0.11
Control Delay	109.9	58.8	3.6	141.2	22.9	60.6	57.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.9	58.8	3.6	141.2	22.9	60.6	57.0	0.6
LOS	F	E	A	F	C	E	E	A
Approach Delay	109.9		37.8				52.4	
Approach LOS	F		D				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 68.4	Intersection LOS: E
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	804	17	396	243	0	62	0	300	271	21	36
Future Volume (veh/h)	0	804	17	396	243	0	62	0	300	271	21	36
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	884	19	435	267	0	68	0	330	314	0	40
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1829	39	385	2768	0	0	0	0	388	0	183
Arrive On Green	0.00	0.53	0.53	0.40	1.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Sat Flow, veh/h	0	3513	74	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	442	461	435	267	0		0.0		314	0	40
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	19.5	19.5	28.5	0.0	0.0				11.3	0.0	2.8
Cycle Q Clear(g_c), s	0.0	19.5	19.5	28.5	0.0	0.0				11.3	0.0	2.8
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	914	955	385	2768	0				388	0	183
V/C Ratio(X)	0.00	0.48	0.48	1.13	0.10	0.00				0.81	0.00	0.22
Avail Cap(c_a), veh/h	0	914	955	385	2768	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.5	17.5	36.2	0.0	0.0				51.5	0.0	47.7
Incr Delay (d2), s/veh	0.0	1.8	1.7	86.6	0.1	0.0				4.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.7	10.1	21.9	0.0	0.0				5.3	0.0	1.2
LnGrp Delay(d),s/veh	0.0	19.4	19.3	122.8	0.1	0.0				55.5	0.0	48.3
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		903			702						354	
Approach Delay, s/veh		19.3			76.1						54.7	
Approach LOS		B			E						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	33.0	69.1		17.9		102.1		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	28.5	28.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	30.5	21.5		13.3		2.0		
Green Ext Time (p_c), s	0.0	2.8		1.0		5.0		

Intersection Summary	
HCM 2010 Ctrl Delay	46.1
HCM 2010 LOS	D

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	848	108	18	953	27	5
Future Volume (vph)	848	108	18	953	27	5
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.2	24.2	9.6	24.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	46.2	46.2	5.5	49.1	13.2	13.2
Actuated g/C Ratio	0.62	0.62	0.07	0.66	0.18	0.18
v/c Ratio	0.83	0.12	0.17	0.88	0.10	0.02
Control Delay	20.4	2.1	48.1	20.2	33.6	21.8
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	20.4	2.1	48.1	20.3	33.6	21.8
LOS	C	A	D	C	C	C
Approach Delay	18.3			20.8	31.9	
Approach LOS	B			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 74.8	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 70.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	848	108	18	953	27	5
Future Volume (veh/h)	848	108	18	953	27	5
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	922	117	20	1036	29	5
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1055	897	38	1222	244	231
Arrive On Green	0.59	0.59	0.02	0.68	0.15	0.15
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	922	117	20	1036	29	5
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	28.8	2.3	0.8	28.9	1.0	0.2
Cycle Q Clear(g_c), s	28.8	2.3	0.8	28.9	1.0	0.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1055	897	38	1222	244	231
V/C Ratio(X)	0.87	0.13	0.53	0.85	0.12	0.02
Avail Cap(c_a), veh/h	1956	1663	122	2217	659	623
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	6.1	32.0	8.1	24.4	24.0
Incr Delay (d2), s/veh	2.4	0.1	4.3	1.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	1.0	0.4	14.7	0.5	0.1
LnGrp Delay(d),s/veh	14.1	6.2	36.3	9.8	24.6	24.0
LnGrp LOS	B	A	D	A	C	C
Approach Vol, veh/h	1039			1056	34	
Approach Delay, s/veh	13.2			10.3	24.5	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.1	45.1				51.2		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.8	30.8				30.9		3.0
Green Ext Time (p_c), s	0.0	8.1				9.9		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	6	0	32	117	9
Future Vol, veh/h	0	6	0	32	117	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	7	0	35	127	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	132	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	923	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	923	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	923	-	-
HCM Lane V/C Ratio	-	0.007	-	-
HCM Control Delay (s)	-	8.9	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	4	29	114	9
Future Vol, veh/h	3	0	4	29	114	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	0	4	32	124	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	169	129	134	0	-	0
Stage 1	129	-	-	-	-	-
Stage 2	40	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	826	926	1463	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	824	926	1463	-	-	-
Mov Cap-2 Maneuver	800	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1463	-	800	-	-
HCM Lane V/C Ratio	0.003	-	0.004	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	0	20	23	79	35
Future Vol, veh/h	9	0	20	23	79	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	10	0	22	25	86	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	173	105	124	0	-	0
Stage 1	105	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	822	955	1475	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	810	955	1475	-	-	-
Mov Cap-2 Maneuver	796	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	946	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	3.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1475	-	796	-	-
HCM Lane V/C Ratio	0.015	-	0.012	-	-
HCM Control Delay (s)	7.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	1	5	35	50	28
Future Vol, veh/h	8	1	5	35	50	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	1	5	38	54	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	119	70	85	0	-	0
Stage 1	70	-	-	-	-	-
Stage 2	49	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	882	998	1524	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	879	998	1524	-	-	-
Mov Cap-2 Maneuver	842	-	-	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	976	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1524	-	857	-	-
HCM Lane V/C Ratio	0.004	-	0.011	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	1	5	32	21	30
Future Vol, veh/h	8	1	5	32	21	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	1	5	35	23	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	85	39	55	0	-	0
Stage 1	39	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	921	1038	1563	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	918	1038	1563	-	-	-
Mov Cap-2 Maneuver	868	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1563	-	884	-	-
HCM Lane V/C Ratio	0.003	-	0.011	-	-
HCM Control Delay (s)	7.3	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	1	2	34	9	14
Future Vol, veh/h	4	1	2	34	9	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	1	2	37	10	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	58	17	25	0	-	0
Stage 1	17	-	-	-	-	-
Stage 2	41	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	954	1068	1603	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	953	1068	1603	-	-	-
Mov Cap-2 Maneuver	889	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	986	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1603	-	920	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	7.2	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	140	793	6	2	8
Future Vol, veh/h	30	140	793	6	2	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	152	862	7	2	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	862	0	-	0	1079	862
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	789	-	-	-	244	358
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	824	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	789	-	-	-	234	358
Mov Cap-2 Maneuver	-	-	-	-	383	-
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	789	-	-	-	383	358
HCM Lane V/C Ratio	0.041	-	-	-	0.006	0.024
HCM Control Delay (s)	9.8	-	-	-	14.5	15.3
HCM Lane LOS	A	-	-	-	B	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	958	0	0	1371	0	0	0	0	1	0	0
Future Vol, veh/h	3	958	0	0	1371	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	1053	0	0	1507	0	0	0	0	1	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	1507	0	-	-	-	0				2040	2566	1507
Stage 1	-	-	-	-	-	-				1507	1507	-
Stage 2	-	-	-	-	-	-				533	1059	-
Critical Hdwy	4.1	-	-	-	-	-				6.6	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.8	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	450	-	0	0	-	-				56	26	150
Stage 1	-	-	0	0	-	-				204	185	-
Stage 2	-	-	0	0	-	-				558	304	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	450	-	-	-	-	-				56	0	150
Mov Cap-2 Maneuver	-	-	-	-	-	-				185	0	-
Stage 1	-	-	-	-	-	-				204	0	-
Stage 2	-	-	-	-	-	-				554	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	450	-	-	-	185
HCM Lane V/C Ratio	0.007	-	-	-	0.006
HCM Control Delay (s)	13.1	-	-	-	24.6
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	827	34	21	945	59	47
Future Vol, veh/h	827	34	21	945	59	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	861	35	22	984	61	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	897	0	1907	448
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	1028	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	765	-	69	564
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	348	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	765	-	67	564
Mov Cap-2 Maneuver	-	-	-	-	245	-
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	338	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	19
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	245	564	-	-	765	-
HCM Lane V/C Ratio	0.251	0.087	-	-	0.029	-
HCM Control Delay (s)	24.5	12	-	-	9.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.1	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	810	32	804	162	39
Future Volume (vph)	810	32	804	162	39
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	26.2	5.1	29.5	10.3	10.3
Actuated g/C Ratio	0.51	0.10	0.57	0.20	0.20
v/c Ratio	0.55	0.22	0.85	0.55	0.13
Control Delay	10.4	28.4	18.3	30.3	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	28.4	18.3	30.3	9.3
LOS	B	C	B	C	A
Approach Delay	10.4		18.7	26.2	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	810	63	32	804	162	39
Future Volume (veh/h)	810	63	32	804	162	39
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	890	69	35	884	178	40
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1547	120	61	1089	300	284
Arrive On Green	0.48	0.48	0.04	0.60	0.19	0.19
Sat Flow, veh/h	3301	249	1619	1800	1619	1530
Grp Volume(v), veh/h	474	485	35	884	178	40
Grp Sat Flow(s),veh/h/ln	1710	1750	1619	1800	1619	1530
Q Serve(g_s), s	10.7	10.7	1.1	20.6	5.4	1.2
Cycle Q Clear(g_c), s	10.7	10.7	1.1	20.6	5.4	1.2
Prop In Lane		0.14	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	824	843	61	1089	300	284
V/C Ratio(X)	0.58	0.58	0.57	0.81	0.59	0.14
Avail Cap(c_a), veh/h	923	944	150	1292	300	284
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.0	10.0	25.5	8.3	20.1	18.4
Incr Delay (d2), s/veh	0.7	0.7	3.1	3.5	8.3	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.3	0.6	10.9	3.1	0.6
LnGrp Delay(d),s/veh	10.7	10.7	28.6	11.7	28.4	19.4
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	959			919	218	
Approach Delay, s/veh	10.7			12.4	26.8	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.6	32.2				38.8		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	3.1	12.7				22.6		7.4
Green Ext Time (p_c), s	0.0	10.2				10.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	738	69	611	225	80
Future Volume (vph)	738	69	611	225	80
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	21.7	5.5	27.0	13.9	13.9
Actuated g/C Ratio	0.42	0.11	0.52	0.27	0.27
v/c Ratio	0.71	0.46	0.74	0.59	0.21
Control Delay	16.3	36.2	14.5	27.4	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	36.2	14.5	27.4	17.4
LOS	B	D	B	C	B
Approach Delay	16.3		16.7	24.8	
Approach LOS	B		B	C	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 52.1			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	738	137	69	611	225	80
Future Volume (veh/h)	738	137	69	611	225	80
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	829	154	78	687	253	72
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1160	215	103	996	400	378
Arrive On Green	0.40	0.40	0.06	0.55	0.25	0.25
Sat Flow, veh/h	2956	532	1619	1800	1619	1530
Grp Volume(v), veh/h	495	488	78	687	253	72
Grp Sat Flow(s),veh/h/ln	1710	1689	1619	1800	1619	1530
Q Serve(g_s), s	13.1	13.1	2.6	14.9	7.6	2.0
Cycle Q Clear(g_c), s	13.1	13.1	2.6	14.9	7.6	2.0
Prop In Lane		0.32	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	692	683	103	996	400	378
V/C Ratio(X)	0.71	0.71	0.76	0.69	0.63	0.19
Avail Cap(c_a), veh/h	814	804	161	1189	400	378
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	13.5	24.9	8.7	18.2	16.1
Incr Delay (d2), s/veh	2.5	2.5	4.2	1.3	7.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.6	1.3	7.6	4.2	1.0
LnGrp Delay(d),s/veh	16.0	16.0	29.1	10.1	25.6	17.2
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	983			765	325	
Approach Delay, s/veh	16.0			12.0	23.7	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.1	28.1				36.2		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.6	15.1				16.9		9.6
Green Ext Time (p_c), s	0.0	6.7				9.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	70.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	398	409	11	5	463	122	19	19	18	95	12	200
Future Vol, veh/h	398	409	11	5	463	122	19	19	18	95	12	200
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	419	431	12	5	487	128	20	20	19	100	13	211

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	617	0	0	444	0	0	1950	1903	224	1627	1845	553
Stage 1	-	-	-	-	-	-	1276	1276	-	563	563	-
Stage 2	-	-	-	-	-	-	674	627	-	1064	1282	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	973	-	-	1127	-	-	44	70	786	~ 76	76	537
Stage 1	-	-	-	-	-	-	179	240	-	514	512	-
Stage 2	-	-	-	-	-	-	448	479	-	242	238	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	973	-	-	1126	-	-	~ 16	40	784	~ 35	43	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	173	50	-	~ 85	106	-
Stage 1	-	-	-	-	-	-	102	136	-	292	509	-
Stage 2	-	-	-	-	-	-	264	476	-	115	135	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.6	0.1	71.5	$ 376
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	109	973	-	-	1126	-	-	191
HCM Lane V/C Ratio	0.541	0.431	-	-	0.005	-	-	1.692
HCM Control Delay (s)	71.5	11.5	-	-	8.2	-	-	$ 376
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	2.5	2.2	-	-	0	-	-	22

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	397	15	25	515	8	58	0	21	2	0	16
Future Vol, veh/h	109	397	15	25	515	8	58	0	21	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	436	16	27	566	9	64	0	23	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	575	0	0	454	0	0	1020	1312	227	1080	1316	287
Stage 1	-	-	-	-	-	-	682	682	-	625	625	-
Stage 2	-	-	-	-	-	-	338	630	-	455	691	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1008	-	-	1117	-	-	194	160	782	175	159	716
Stage 1	-	-	-	-	-	-	411	453	-	444	480	-
Stage 2	-	-	-	-	-	-	656	478	-	560	449	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1008	-	-	1117	-	-	169	138	781	152	137	716
Mov Cap-2 Maneuver	-	-	-	-	-	-	313	278	-	152	137	-
Stage 1	-	-	-	-	-	-	363	400	-	392	468	-
Stage 2	-	-	-	-	-	-	625	466	-	480	396	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.4	17.6	12.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	372	1008	-	-	1117	-	-	507
HCM Lane V/C Ratio	0.233	0.118	-	-	0.025	-	-	0.039
HCM Control Delay (s)	17.6	9	-	-	8.3	-	-	12.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.9	0.4	-	-	0.1	-	-	0.1

Intersection	
Intersection Delay, s/veh	25.9
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	228	0	193	0	0	0	0	0	294	456	0
Future Vol, veh/h	0	228	0	193	0	0	0	0	0	294	456	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	245	0	208	0	0	0	0	0	316	490	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	17	36.4
HCM LOS	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	294	456	228	193	118	251
LT Vol	294	0	228	0	0	0
Through Vol	0	456	0	0	118	0
RT Vol	0	0	0	193	0	251
Lane Flow Rate	316	490	245	208	127	270
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.64	0.91	0.541	0.388	0.261	0.501
Departure Headway (Hd)	7.288	6.678	8.055	6.829	7.403	6.683
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	499	539	451	531	487	542
Service Time	4.988	4.477	5.755	4.529	5.109	4.39
HCM Lane V/C Ratio	0.633	0.909	0.543	0.392	0.261	0.498
HCM Control Delay	22	45.7	19.8	13.8	12.7	15.9
HCM Lane LOS	C	E	C	B	B	C
HCM 95th-tile Q	4.4	10.8	3.1	1.8	1	2.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

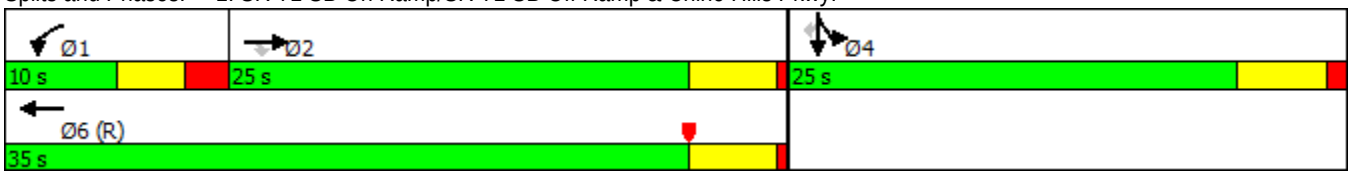
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↑	↱
Traffic Vol, veh/h	0	0	118	251
Future Vol, veh/h	0	0	118	251
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	127	270
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	14.9
HCM LOS	B

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1160	688	18	958	422	235	693
Future Volume (vph)	1160	688	18	958	422	235	693
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.42	0.74	0.14	0.58	0.66	0.63	1.24
Control Delay	11.5	11.2	37.7	9.4	24.6	22.9	142.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	11.2	37.7	9.4	24.6	22.9	142.6
LOS	B	B	D	A	C	C	F
Approach Delay	11.4			9.9		84.8	
Approach LOS	B			A		F	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 81.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1160	688	18	958	0	0	0	0	422	235	693
Future Volume (veh/h)	0	1160	688	18	958	0	0	0	0	422	235	693
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1221	598	19	1008	0				346	385	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2492	607	37	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.05	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1221	598	19	1008	0				346	385	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	8.8	23.6	0.7	0.0	0.0				10.9	10.9	0.0
Cycle Q Clear(g_c), s	0.0	8.8	23.6	0.7	0.0	0.0				10.9	10.9	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2492	607	37	1739	0				540	600	510
V/C Ratio(X)	0.00	0.49	0.99	0.52	0.58	0.00				0.64	0.64	0.00
Avail Cap(c_a), veh/h	0	2492	607	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.77	0.77	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.3	17.8	28.3	0.0	0.0				17.0	17.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	32.8	3.2	1.1	0.0				5.8	5.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	15.2	0.3	0.3	0.0				5.7	6.2	0.0
LnGrp Delay(d),s/veh	0.0	13.5	50.6	31.6	1.1	0.0				22.7	22.2	0.0
LnGrp LOS		B	D	C	A					C	C	
Approach Vol, veh/h		1819			1027						731	
Approach Delay, s/veh		25.7			1.7						22.4	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.4	28.6		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	25.6		12.9		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.6		21.6		

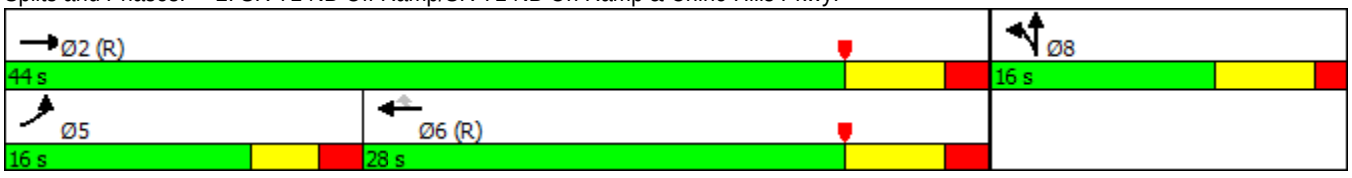
Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	410	1170	624	590	352	106
Future Volume (vph)	410	1170	624	590	352	106
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.9	37.5	21.6	21.6	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.82	0.59	0.55	0.91	0.77	0.58
Control Delay	38.0	9.4	17.4	33.0	47.9	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	9.4	17.4	33.0	47.9	27.9
LOS	D	A	B	C	D	C
Approach Delay		16.8	25.0			35.5
Approach LOS		B	C			D

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 81.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	410	1170	0	0	624	590	352	106	5	0	0	0
Future Volume (veh/h)	410	1170	0	0	624	590	352	106	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	441	1258	0	0	671	631	378	114	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	528	2138	0	0	1242	548	540	297	3			
Arrive On Green	0.18	0.63	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1782	16			
Grp Volume(v), veh/h	441	1258	0	0	671	631	378	0	115			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	8.6	13.1	0.0	0.0	9.3	21.8	6.6	0.0	3.4			
Cycle Q Clear(g_c), s	8.6	13.1	0.0	0.0	9.3	21.8	6.6	0.0	3.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	528	2138	0	0	1242	548	540	0	300			
V/C Ratio(X)	0.84	0.59	0.00	0.00	0.54	1.15	0.70	0.00	0.38			
Avail Cap(c_a), veh/h	542	2138	0	0	1242	548	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.88	0.88	0.00	0.00	0.52	0.52	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.8	6.7	0.0	0.0	15.1	19.1	23.6	0.0	22.3			
Incr Delay (d2), s/veh	9.6	1.1	0.0	0.0	0.9	79.5	7.4	0.0	3.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.2	6.4	0.0	0.0	4.5	21.1	3.5	0.0	2.0			
LnGrp Delay(d),s/veh	33.4	7.7	0.0	0.0	16.0	98.6	31.0	0.0	26.0			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1699			1302			493				
Approach Delay, s/veh		14.4			56.0			29.8				
Approach LOS		B			E			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			15.7	28.3		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		15.1			10.6	23.8		8.6
Green Ext Time (p_c), s		16.6			0.1	0.0		0.3

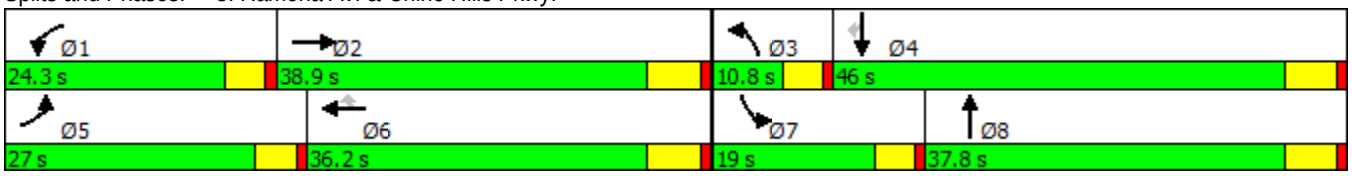
Intersection Summary	
HCM 2010 Ctrl Delay	32.1
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	256	917	143	775	135	22	295	161	463	416
Future Volume (vph)	256	917	143	775	135	22	295	161	463	416
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	21.5	36.9	15.0	30.4	30.4	5.7	32.0	14.0	44.2	44.2
Actuated g/C Ratio	0.18	0.31	0.13	0.26	0.26	0.05	0.27	0.12	0.37	0.37
v/c Ratio	0.93	0.64	0.75	0.94	0.29	0.30	0.50	0.90	0.39	0.53
Control Delay	86.0	38.2	71.6	62.9	6.6	65.0	33.7	96.7	29.6	5.2
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.0	38.6	71.6	62.9	6.6	65.0	33.7	96.7	29.6	5.2
LOS	F	D	E	E	A	E	C	F	C	A
Approach Delay		48.9		56.8			35.2		30.2	
Approach LOS		D		E			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.7	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 44.2	Intersection LOS: D
Intersection Capacity Utilization 92.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	917	2	143	775	135	22	295	139	161	463	416
Future Volume (veh/h)	256	917	2	143	775	135	22	295	139	161	463	416
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	272	976	2	152	824	99	23	314	93	171	493	333
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	295	1657	3	177	870	384	36	700	203	195	1254	552
Arrive On Green	0.18	0.33	0.33	0.11	0.25	0.25	0.02	0.27	0.27	0.12	0.37	0.37
Sat Flow, veh/h	1619	5064	10	1619	3420	1509	1619	2605	757	1619	3420	1507
Grp Volume(v), veh/h	272	631	347	152	824	99	23	204	203	171	493	333
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1652	1619	1710	1507
Q Serve(g_s), s	19.7	19.1	19.1	11.0	28.2	6.2	1.7	11.8	12.2	12.4	12.7	21.4
Cycle Q Clear(g_c), s	19.7	19.1	19.1	11.0	28.2	6.2	1.7	11.8	12.2	12.4	12.7	21.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	295	1072	588	177	870	384	36	459	444	195	1254	552
V/C Ratio(X)	0.92	0.59	0.59	0.86	0.95	0.26	0.64	0.44	0.46	0.88	0.39	0.60
Avail Cap(c_a), veh/h	304	1072	588	268	873	385	84	459	444	196	1254	552
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	33.4	33.4	52.2	43.6	35.4	57.7	36.2	36.3	51.5	27.9	30.7
Incr Delay (d2), s/veh	30.9	1.0	1.9	10.9	19.1	0.5	6.7	3.1	3.4	32.2	0.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	8.8	9.8	5.5	15.6	2.7	0.8	6.0	6.0	7.3	6.2	9.7
LnGrp Delay(d),s/veh	78.7	34.4	35.3	63.1	62.7	35.9	64.4	39.3	39.7	83.8	28.9	35.5
LnGrp LOS	E	C	D	E	E	D	E	D	D	F	C	D
Approach Vol, veh/h		1250			1075			430			997	
Approach Delay, s/veh		44.3			60.3			40.8			40.5	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	44.8	7.3	49.5	26.3	36.1	18.9	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	13.0	21.1	3.7	23.4	21.7	30.2	14.4	14.2
Green Ext Time (p_c), s	0.1	9.6	0.0	6.0	0.0	0.1	0.0	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	47.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	908	124	46	882	90	28
Future Vol, veh/h	908	124	46	882	90	28
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1009	138	51	980	100	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1012	0	1604	507
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	592	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	693	-	~ 98	516
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	521	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	693	-	~ 91	515
Mov Cap-2 Maneuver	-	-	-	-	263	-
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	26.2
HCM LOS			D

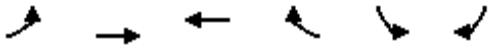
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	298	-	-	693	-
HCM Lane V/C Ratio	0.44	-	-	0.074	-
HCM Control Delay (s)	26.2	-	-	10.6	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.1	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	124	812	687	60	241
Future Volume (vph)	124	812	687	60	241
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	11.3	43.0	27.1	23.6	36.1
Actuated g/C Ratio	0.14	0.55	0.35	0.30	0.46
v/c Ratio	0.58	0.47	0.69	0.07	0.35
Control Delay	43.2	11.2	25.3	23.6	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	11.2	25.3	23.6	8.3
LOS	D	B	C	C	A
Approach Delay		15.5	25.3	11.3	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 78.4	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 60.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	124	812	687	62	60	241
Future Volume (veh/h)	124	812	687	62	60	241
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	135	883	747	65	65	76
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	166	2011	1370	119	812	577
Arrive On Green	0.10	0.59	0.43	0.43	0.27	0.27
Sat Flow, veh/h	1619	3510	3268	276	2956	1530
Grp Volume(v), veh/h	135	883	402	410	65	76
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1744	1478	1530
Q Serve(g_s), s	6.9	12.1	14.8	14.8	1.4	2.8
Cycle Q Clear(g_c), s	6.9	12.1	14.8	14.8	1.4	2.8
Prop In Lane	1.00			0.16	1.00	1.00
Lane Grp Cap(c), veh/h	166	2011	737	752	812	577
V/C Ratio(X)	0.81	0.44	0.55	0.55	0.08	0.13
Avail Cap(c_a), veh/h	544	3449	1056	1077	812	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	9.7	17.9	17.9	22.7	17.2
Incr Delay (d2), s/veh	3.6	0.2	0.9	0.9	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	5.7	7.1	7.2	0.6	3.0
LnGrp Delay(d),s/veh	40.8	9.9	18.8	18.8	22.9	17.7
LnGrp LOS	D	A	B	B	C	B
Approach Vol, veh/h		1018	812		141	
Approach Delay, s/veh		14.0	18.8		20.1	
Approach LOS		B	B		C	

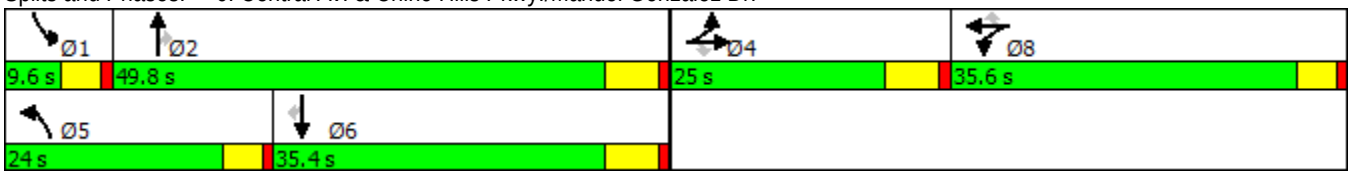
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		55.5		29.0	13.3	42.2		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		14.1		4.8	8.9	16.8		
Green Ext Time (p_c), s		26.4		0.4	0.1	19.7		

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	494	2	417	11	42	33	330	750	1	10	844	231
Future Volume (vph)	494	2	417	11	42	33	330	750	1	10	844	231
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	24.0	49.8	49.8	9.6	35.4	35.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	20.0%	41.5%	41.5%	8.0%	29.5%	29.5%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	19.6	52.7	52.7	5.1	30.0	30.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.20	0.53	0.53	0.05	0.30	0.30
v/c Ratio	0.90	0.86	0.69	0.05	0.19	0.10	1.14	0.45	0.00	0.14	0.90	0.45
Control Delay	74.9	66.9	10.0	37.5	40.3	0.6	131.6	18.7	0.0	54.2	47.8	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.9	66.9	10.0	37.5	40.3	0.6	131.6	18.7	0.0	54.2	47.8	16.0
LOS	E	E	A	D	D	A	F	B	A	D	D	B
Approach Delay		43.1			24.8			53.2			41.1	
Approach LOS		D			C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 45.3	Intersection LOS: D
Intersection Capacity Utilization 80.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	494	2	417	11	42	33	330	750	1	10	844	231
Future Volume (veh/h)	494	2	417	11	42	33	330	750	1	10	844	231
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	538	0	325	12	46	19	359	815	1	11	917	181
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	632	0	299	155	172	145	319	1658	741	21	1029	454
Arrive On Green	0.20	0.00	0.20	0.10	0.10	0.10	0.20	0.48	0.48	0.01	0.30	0.30
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	538	0	325	12	46	19	359	815	1	11	917	181
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	15.8	0.0	19.2	0.7	2.3	1.1	19.4	15.9	0.0	0.7	25.2	9.4
Cycle Q Clear(g_c), s	15.8	0.0	19.2	0.7	2.3	1.1	19.4	15.9	0.0	0.7	25.2	9.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	632	0	299	155	172	145	319	1658	741	21	1029	454
V/C Ratio(X)	0.85	0.00	1.09	0.08	0.27	0.13	1.12	0.49	0.00	0.51	0.89	0.40
Avail Cap(c_a), veh/h	632	0	299	510	567	479	319	1658	741	82	1029	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	0.0	39.6	40.6	41.3	40.8	39.5	17.1	13.1	48.2	32.9	27.3
Incr Delay (d2), s/veh	10.8	0.0	77.8	0.2	0.8	0.4	88.4	1.0	0.0	7.0	11.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.0	14.5	0.3	1.2	0.5	16.4	7.7	0.0	0.3	13.5	4.2
LnGrp Delay(d),s/veh	49.0	0.0	117.4	40.8	42.1	41.2	127.9	18.2	13.1	55.2	44.5	29.9
LnGrp LOS	D		F	D	D	D	F	B	B	E	D	C
Approach Vol, veh/h		863			77			1175			1109	
Approach Delay, s/veh		74.8			41.7			51.7			42.2	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	53.5		25.0	24.0	35.4		14.0
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	19.4	29.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	17.9		21.2	21.4	27.2		4.3
Green Ext Time (p_c), s	0.0	18.2		0.0	0.0	2.2		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	54.4
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	26	5	748	4	475	9	572	826	573	709
Future Volume (vph)	26	5	748	4	475	9	572	826	573	709
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	28.1	28.1	71.5	5.0	23.8	23.8	37.6	64.1
Actuated g/C Ratio	0.09	0.09	0.24	0.24	0.61	0.04	0.20	0.20	0.32	0.55
v/c Ratio	0.20	0.17	1.06	1.01	0.48	0.13	0.86	1.08	1.15	0.28
Control Delay	55.0	26.6	107.5	93.2	8.5	59.8	59.2	70.7	126.2	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	26.6	107.5	93.2	8.5	59.8	59.2	70.7	126.2	15.4
LOS	E	C	F	F	A	E	E	E	F	B
Approach Delay		41.1		64.7			65.9			64.2
Approach LOS		D		E			E			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.1	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 64.7	Intersection LOS: E
Intersection Capacity Utilization 110.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	5	20	748	4	475	9	572	826	573	709	18
Future Volume (veh/h)	26	5	20	748	4	475	9	572	826	573	709	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	27	5	12	782	0	344	9	596	684	597	739	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	105	31	73	771	0	852	18	689	304	516	2525	51
Arrive On Green	0.06	0.06	0.06	0.24	0.00	0.24	0.01	0.20	0.20	0.32	0.51	0.51
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	1619	4955	100
Grp Volume(v), veh/h	27	0	17	782	0	344	9	596	684	597	488	266
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.9	0.0	1.2	28.0	0.0	15.1	0.7	19.8	23.7	37.5	10.1	10.1
Cycle Q Clear(g_c), s	1.9	0.0	1.2	28.0	0.0	15.1	0.7	19.8	23.7	37.5	10.1	10.1
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	105	0	104	771	0	852	18	689	304	516	1669	907
V/C Ratio(X)	0.26	0.00	0.16	1.01	0.00	0.40	0.51	0.86	2.25	1.16	0.29	0.29
Avail Cap(c_a), veh/h	138	0	136	771	0	852	69	689	304	516	1669	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	0.0	52.0	44.8	0.0	14.9	57.9	45.4	47.0	40.1	16.6	16.6
Incr Delay (d2), s/veh	0.5	0.0	0.3	36.1	0.0	0.3	8.4	13.7	573.7	90.5	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	16.3	0.0	6.4	0.3	10.7	58.2	29.6	4.6	5.2
LnGrp Delay(d),s/veh	52.8	0.0	52.3	80.9	0.0	15.2	66.2	59.1	620.6	130.6	17.1	17.5
LnGrp LOS	D		D	F		B	E	E	F	F	B	B
Approach Vol, veh/h		44			1126			1289			1351	
Approach Delay, s/veh		52.6			60.8			357.1			67.3	
Approach LOS		D			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.2	5.9	65.7		33.8
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.5	25.7		3.9	2.7	12.1		30.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	24.9		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		163.3
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1292	895	158
Future Volume (vph)	1292	895	158
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	85.8	85.8	24.7
Actuated g/C Ratio	0.72	0.72	0.21
v/c Ratio	0.51	0.27	1.05dr
Control Delay	5.3	6.7	52.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.3	6.7	52.2
LOS	A	A	D
Approach Delay	5.3	6.7	52.2
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1292	382	0	895	158	341
Future Volume (veh/h)	1292	382	0	895	158	341
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1360	402	0	942	166	198
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2915	858	0	3799	239	226
Arrive On Green	1.00	1.00	0.00	0.77	0.15	0.15
Sat Flow, veh/h	3932	1110	0	5238	1619	1530
Grp Volume(v), veh/h	1181	581	0	942	166	198
Grp Sat Flow(s),veh/h/ln	1638	1604	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	6.5	11.7	15.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.5	11.7	15.2
Prop In Lane		0.69	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2533	1240	0	3799	239	226
V/C Ratio(X)	0.47	0.47	0.00	0.25	0.69	0.88
Avail Cap(c_a), veh/h	2533	1240	0	3799	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	3.8	48.6	50.1
Incr Delay (d2), s/veh	0.6	1.3	0.0	0.2	1.4	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.0	2.9	5.3	6.7
LnGrp Delay(d),s/veh	0.6	1.3	0.0	4.0	49.9	54.3
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1762			942	364	
Approach Delay, s/veh	0.8			4.0	52.3	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		97.3				97.3		22.7
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				8.5		17.2
Green Ext Time (p_c), s		21.7				21.3		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	7.9
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	717	88	704	957	0
Future Volume (vph)	717	88	704	957	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	31.8	31.8	31.8	80.2	80.2
Actuated g/C Ratio	0.26	0.26	0.26	0.67	0.67
v/c Ratio	0.56	0.19	0.81	0.85	0.89
Control Delay	40.3	8.2	42.6	24.9	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	8.2	42.6	24.9	29.0
LOS	D	A	D	C	C
Approach Delay	36.8		42.6		27.0
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 33.7	Intersection LOS: C
Intersection Capacity Utilization 82.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	✥	
Traffic Volume (veh/h)	0	717	88	0	704	349	0	0	0	957	0	781
Future Volume (veh/h)	0	717	88	0	704	349	0	0	0	957	0	781
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	724	0	0	711	353				815	213	663
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1737	541	0	1158	541				939	224	697
Arrive On Green	0.00	0.35	0.00	0.00	0.12	0.12				0.58	0.58	0.58
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	386	1202
Grp Volume(v), veh/h	0	724	0	0	711	353				815	0	876
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1588
Q Serve(g_s), s	0.0	13.4	0.0	0.0	24.8	26.5				51.1	0.0	62.1
Cycle Q Clear(g_c), s	0.0	13.4	0.0	0.0	24.8	26.5				51.1	0.0	62.1
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.76
Lane Grp Cap(c), veh/h	0	1737	541	0	1158	541				939	0	921
V/C Ratio(X)	0.00	0.42	0.00	0.00	0.61	0.65				0.87	0.00	0.95
Avail Cap(c_a), veh/h	0	1737	541	0	1158	541				1100	0	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.4	0.0	0.0	45.2	46.0				21.3	0.0	23.6
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	2.4	6.0				6.0	0.0	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.2	0.0	0.0	11.7	12.1				24.2	0.0	30.8
LnGrp Delay(d),s/veh	0.0	30.1	0.0	0.0	47.6	52.0				27.3	0.0	38.6
LnGrp LOS		C			D	D				C		D
Approach Vol, veh/h		724			1064						1691	
Approach Delay, s/veh		30.1			49.1						33.2	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		46.9		73.1		46.9		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		15.4		64.1		28.5		
Green Ext Time (p_c), s		8.3		5.5		1.6		

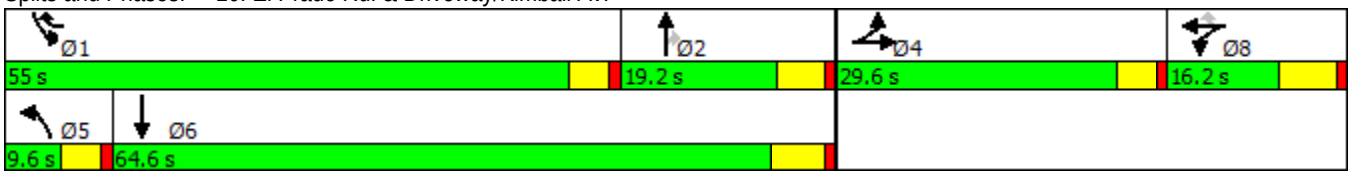
Intersection Summary	
HCM 2010 Ctrl Delay	37.4
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	35	8	3	871	4	202	24	991	352
Future Volume (vph)	35	8	3	871	4	202	24	991	352
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.17	0.07	0.14	0.77	0.05	0.78	0.07	1.18	0.18
Control Delay	42.7	29.8	48.4	10.2	53.2	63.5	0.4	117.9	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	29.8	48.4	10.2	53.2	63.5	0.4	117.9	10.8
LOS	D	C	D	B	D	E	A	F	B
Approach Delay		38.8	11.3			56.8			89.0
Approach LOS		D	B			E			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 57.6	Intersection LOS: E
Intersection Capacity Utilization 94.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	8	8	23	3	871	4	202	24	991	352	14
Future Volume (veh/h)	35	8	8	23	3	871	4	202	24	991	352	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	37	8	6	24	3	466	4	213	24	1043	371	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	71	53	148	19	895	78	244	207	790	1933	73
Arrive On Green	0.07	0.07	0.07	0.10	0.10	0.10	0.05	0.14	0.14	0.49	0.58	0.58
Sat Flow, veh/h	1619	956	717	1532	191	1530	1619	1800	1530	1619	3361	127
Grp Volume(v), veh/h	37	0	14	27	0	466	4	213	24	1043	188	197
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1723	0	1530	1619	1800	1530	1619	1710	1777
Q Serve(g_s), s	2.2	0.0	0.8	1.5	0.0	10.0	0.2	12.0	1.4	50.4	5.4	5.5
Cycle Q Clear(g_c), s	2.2	0.0	0.8	1.5	0.0	10.0	0.2	12.0	1.4	50.4	5.4	5.5
Prop In Lane	1.00		0.43	0.89		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	125	167	0	895	78	244	207	790	983	1022
V/C Ratio(X)	0.31	0.00	0.11	0.16	0.00	0.52	0.05	0.87	0.12	1.32	0.19	0.19
Avail Cap(c_a), veh/h	392	0	405	167	0	895	78	244	207	790	983	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	44.6	42.8	0.0	12.8	46.9	43.8	39.2	26.4	10.5	10.5
Incr Delay (d2), s/veh	1.4	0.0	0.4	0.4	0.0	0.5	0.1	27.6	0.2	152.8	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.4	0.7	0.0	8.0	0.1	7.8	0.6	55.9	2.6	2.7
LnGrp Delay(d),s/veh	46.7	0.0	45.0	43.2	0.0	13.3	47.0	71.3	39.5	179.3	10.6	10.6
LnGrp LOS	D		D	D		B	D	E	D	F	B	B
Approach Vol, veh/h		51			493			241			1428	
Approach Delay, s/veh		46.2			15.0			67.8			133.8	
Approach LOS		D			B			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.8		12.3	9.6	65.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	14.0		4.2	2.2	7.5		12.0
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	3.5		0.0

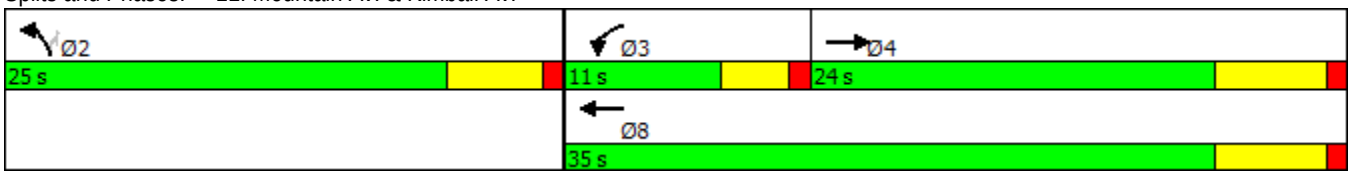
Intersection Summary	
HCM 2010 Ctrl Delay	98.1
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1025	50	747	146	142
Future Volume (vph)	1025	50	747	146	142
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	18.7	7.3	22.3	9.9	9.9
Actuated g/C Ratio	0.43	0.17	0.51	0.23	0.23
v/c Ratio	0.85	0.21	0.47	0.44	0.34
Control Delay	23.5	21.9	8.4	19.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	21.9	8.4	19.7	5.7
LOS	C	C	A	B	A
Approach Delay	23.5		9.3	12.8	
Approach LOS	C		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1025	91	50	747	146	142
Future Volume (veh/h)	1025	91	50	747	146	142
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1126	98	55	821	160	133
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1286	112	127	1966	263	249
Arrive On Green	0.40	0.40	0.08	0.57	0.16	0.16
Sat Flow, veh/h	3274	277	1619	3510	1619	1530
Grp Volume(v), veh/h	604	620	55	821	160	133
Grp Sat Flow(s),veh/h/ln	1710	1751	1619	1710	1619	1530
Q Serve(g_s), s	14.0	14.1	1.4	5.8	4.0	3.4
Cycle Q Clear(g_c), s	14.0	14.1	1.4	5.8	4.0	3.4
Prop In Lane		0.16	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	690	707	127	1966	263	249
V/C Ratio(X)	0.88	0.88	0.43	0.42	0.61	0.53
Avail Cap(c_a), veh/h	715	732	263	2304	741	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	11.8	18.9	5.1	16.8	16.5
Incr Delay (d2), s/veh	10.9	10.9	0.9	0.1	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	8.8	0.7	2.6	1.8	1.5
LnGrp Delay(d),s/veh	22.8	22.7	19.8	5.2	17.6	17.2
LnGrp LOS	C	C	B	A	B	B
Approach Vol, veh/h	1224			876	293	
Approach Delay, s/veh	22.7			6.1	17.4	
Approach LOS	C			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	7.4	23.4				30.8
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		6.0	3.4	16.1				7.8
Green Ext Time (p_c), s		0.2	0.0	1.3				6.3

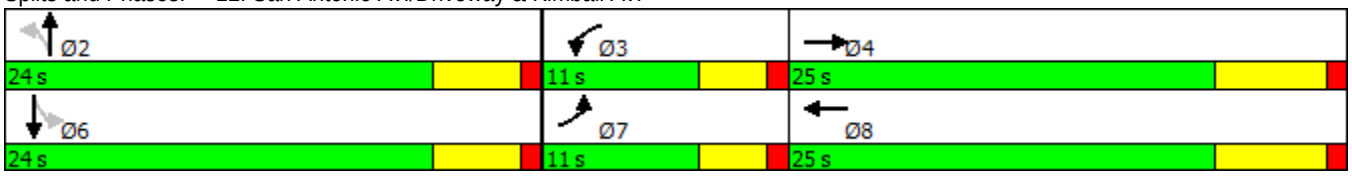
Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	25	1123	15	732	64	0	76	0
Future Volume (vph)	25	1123	15	732	64	0	76	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	25.0	11.0	25.0	24.0	24.0	24.0	24.0
Total Split (%)	18.3%	41.7%	18.3%	41.7%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	19.7	7.2	19.7	9.1	9.1	9.1	9.1
Actuated g/C Ratio	0.17	0.47	0.17	0.47	0.22	0.22	0.22	0.22
v/c Ratio	0.09	0.76	0.06	0.46	0.24	0.03	0.29	0.02
Control Delay	19.0	16.8	18.8	10.3	16.2	0.1	17.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	16.8	18.8	10.3	16.2	0.1	17.0	0.0
LOS	B	B	B	B	B	A	B	A
Approach Delay		16.9		10.5		12.6		15.2
Approach LOS		B		B		B		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 41.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.3 — Intersection LOS: B
Intersection Capacity Utilization 54.6% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1123	42	15	732	12	64	0	18	76	0	9
Future Volume (veh/h)	25	1123	42	15	732	12	64	0	18	76	0	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	1182	44	16	771	13	67	0	17	80	0	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	1428	53	46	1444	24	409	0	267	401	0	267
Arrive On Green	0.04	0.42	0.42	0.03	0.41	0.41	0.17	0.00	0.17	0.17	0.00	0.17
Sat Flow, veh/h	1619	3363	125	1619	3529	59	1349	0	1530	1339	0	1530
Grp Volume(v), veh/h	26	601	625	16	393	391	67	0	17	80	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1778	1619	1800	1788	1349	0	1530	1339	0	1530
Q Serve(g_s), s	0.6	12.5	12.5	0.4	6.6	6.6	1.7	0.0	0.4	2.1	0.0	0.2
Cycle Q Clear(g_c), s	0.6	12.5	12.5	0.4	6.6	6.6	1.9	0.0	0.4	2.5	0.0	0.2
Prop In Lane	1.00		0.07	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	726	755	46	737	732	409	0	267	401	0	267
V/C Ratio(X)	0.37	0.83	0.83	0.35	0.53	0.53	0.16	0.00	0.06	0.20	0.00	0.03
Avail Cap(c_a), veh/h	283	811	843	283	854	848	816	0	730	806	0	730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.6	10.2	10.2	19.1	8.9	8.9	14.5	0.0	13.8	14.8	0.0	13.7
Incr Delay (d2), s/veh	1.2	5.8	5.6	1.6	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.0	7.3	0.2	3.3	3.3	0.6	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	19.8	16.0	15.8	20.7	9.2	9.2	14.6	0.0	13.8	14.9	0.0	13.7
LnGrp LOS	B	B	B	C	A	A	B		B	B		B
Approach Vol, veh/h		1252			800			84			89	
Approach Delay, s/veh		16.0			9.4			14.4			14.8	
Approach LOS		B			A			B			B	

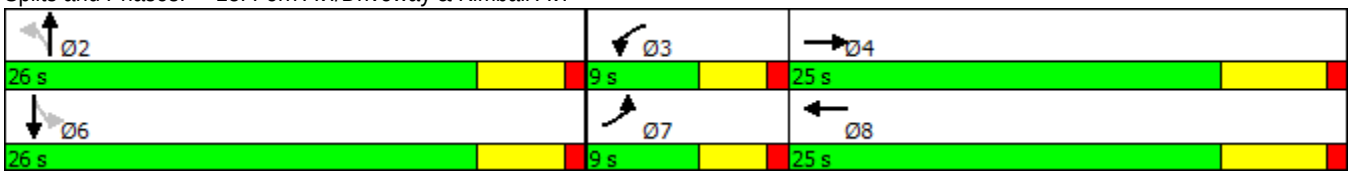
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.1	23.0		11.9	5.8	22.4
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		3.9	2.4	14.5		4.5	2.6	8.6
Green Ext Time (p_c), s		0.2	0.0	2.5		0.2	0.0	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1188	11	674	47	1	187	7
Future Volume (vph)	20	1188	11	674	47	1	187	7
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	19.9	5.2	19.9	11.3	11.3	11.3	11.3
Actuated g/C Ratio	0.12	0.46	0.12	0.46	0.26	0.26	0.26	0.26
v/c Ratio	0.12	0.88	0.07	0.50	0.17	0.10	0.66	0.11
Control Delay	22.9	23.1	22.3	11.6	13.7	5.7	25.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	23.1	22.3	11.6	13.7	5.7	25.1	6.5
LOS	C	C	C	B	B	A	C	A
Approach Delay		23.1		11.8		10.0		21.7
Approach LOS		C		B		B		C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 62.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1188	21	11	674	11	47	1	38	187	7	34
Future Volume (veh/h)	20	1188	21	11	674	11	47	1	38	187	7	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	23	1350	18	12	766	12	53	1	23	212	8	21
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	45	1495	20	25	1448	23	433	14	320	437	95	251
Arrive On Green	0.03	0.43	0.43	0.02	0.42	0.42	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1619	3455	46	1619	3445	54	1325	64	1475	1331	440	1156
Grp Volume(v), veh/h	23	668	700	12	380	398	53	0	24	212	0	29
Grp Sat Flow(s),veh/h/ln	1619	1710	1791	1619	1710	1789	1325	0	1540	1331	0	1596
Q Serve(g_s), s	0.6	15.8	15.9	0.3	7.2	7.2	1.4	0.0	0.5	6.6	0.0	0.6
Cycle Q Clear(g_c), s	0.6	15.8	15.9	0.3	7.2	7.2	2.1	0.0	0.5	7.1	0.0	0.6
Prop In Lane	1.00		0.03	1.00		0.03	1.00		0.96	1.00		0.72
Lane Grp Cap(c), veh/h	45	740	775	25	719	752	433	0	334	437	0	346
V/C Ratio(X)	0.51	0.90	0.90	0.48	0.53	0.53	0.12	0.00	0.07	0.48	0.00	0.08
Avail Cap(c_a), veh/h	186	757	793	186	757	792	787	0	745	793	0	772
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.9	11.5	11.5	21.3	9.4	9.4	14.4	0.0	13.6	16.4	0.0	13.6
Incr Delay (d2), s/veh	3.3	13.5	13.1	5.1	0.2	0.2	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	10.2	10.6	0.2	3.4	3.6	0.5	0.0	0.2	2.5	0.0	0.3
LnGrp Delay(d),s/veh	24.2	25.0	24.6	26.4	9.7	9.6	14.5	0.0	13.6	16.7	0.0	13.7
LnGrp LOS	C	C	C	C	A	A	B		B	B		B
Approach Vol, veh/h		1391			790			77			241	
Approach Delay, s/veh		24.8			9.9			14.2			16.4	
Approach LOS		C			A			B			B	

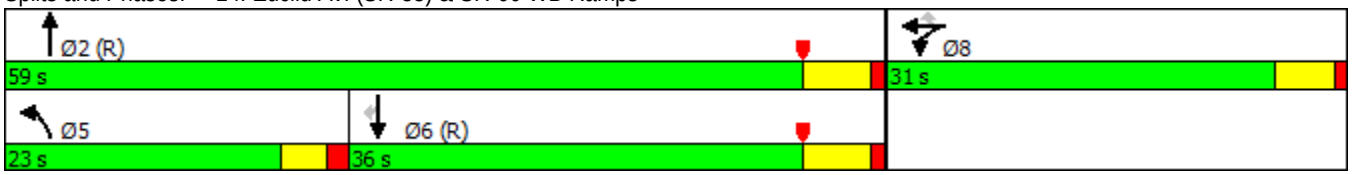
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.4	4.7	24.6		14.4	5.2	24.0
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		4.1	2.3	17.9		9.1	2.6	9.2
Green Ext Time (p_c), s		0.4	0.0	1.0		0.3	0.0	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	636	6	414	540	1056	929	538
Future Volume (vph)	636	6	414	540	1056	929	538
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.6	24.6	24.6	19.9	54.9	30.5	30.5
Actuated g/C Ratio	0.27	0.27	0.27	0.22	0.61	0.34	0.34
v/c Ratio	0.91	0.89	0.77	1.59	0.53	0.84	0.65
Control Delay	59.2	54.5	34.6	293.8	22.8	35.8	6.1
Queue Delay	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Total Delay	59.2	54.5	34.6	293.8	25.5	35.8	6.1
LOS	E	D	C	F	C	D	A
Approach Delay		49.8			116.2	24.9	
Approach LOS		D			F	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.59	
Intersection Signal Delay: 66.7	Intersection LOS: E
Intersection Capacity Utilization 110.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	636	6	414	540	1056	0	0	929	538
Future Volume (veh/h)	0	0	0	636	6	414	540	1056	0	0	929	538
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				759	0	190	568	1112	0	0	978	566
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				838	0	391	333	2136	0	0	1262	546
Arrive On Green				0.26	0.00	0.26	0.41	1.00	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1481
Grp Volume(v), veh/h				759	0	190	568	1112	0	0	978	566
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1481
Q Serve(g_s), s				20.4	0.0	9.6	18.5	0.0	0.0	0.0	22.7	33.2
Cycle Q Clear(g_c), s				20.4	0.0	9.6	18.5	0.0	0.0	0.0	22.7	33.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				838	0	391	333	2136	0	0	1262	546
V/C Ratio(X)				0.91	0.00	0.49	1.71	0.52	0.00	0.00	0.78	1.04
Avail Cap(c_a), veh/h				935	0	436	333	2136	0	0	1262	546
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.3	0.0	28.3	26.5	0.0	0.0	0.0	25.1	28.4
Incr Delay (d2), s/veh				10.7	0.0	0.3	319.2	0.1	0.0	0.0	4.7	48.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.3	0.0	4.0	37.6	0.0	0.0	0.0	11.6	20.8
LnGrp Delay(d),s/veh				43.0	0.0	28.6	345.7	0.1	0.0	0.0	29.8	76.6
LnGrp LOS				D		C	F	A			C	F
Approach Vol, veh/h					949			1680			1544	
Approach Delay, s/veh					40.1			116.9			46.9	
Approach LOS					D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.7			23.0	38.7		28.3
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			20.5	35.2		22.4
Green Ext Time (p_c), s		40.3			0.0	0.0		0.9

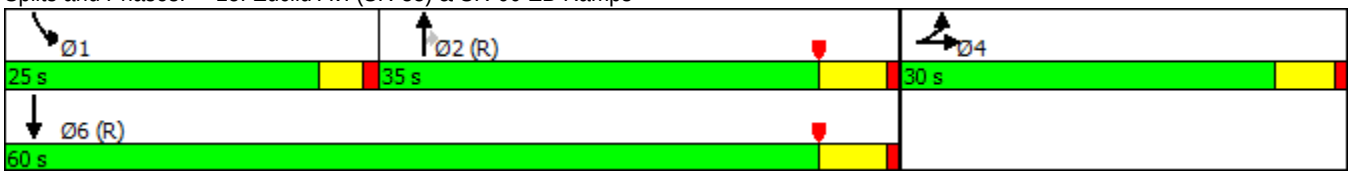
Intersection Summary	
HCM 2010 Ctrl Delay	73.6
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	384	2	1213	766	307	1259
Future Volume (vph)	384	2	1213	766	307	1259
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	25.0	25.0	30.9	30.9	19.6	54.5
Actuated g/C Ratio	0.28	0.28	0.34	0.34	0.22	0.61
v/c Ratio	0.83	1.33	1.05	0.82	0.89	0.62
Control Delay	48.8	191.1	72.5	13.4	52.3	5.2
Queue Delay	20.5	1.6	0.0	0.0	0.0	0.9
Total Delay	69.3	192.7	72.5	13.4	52.3	6.1
LOS	E	F	E	B	D	A
Approach Delay		147.1	49.6			15.1
Approach LOS		F	D			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 57.9	Intersection LOS: E
Intersection Capacity Utilization 110.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	384	2	550	0	0	0	0	1213	766	307	1259	0
Future Volume (veh/h)	384	2	550	0	0	0	0	1213	766	307	1259	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	392	2	484				0	1238	782	313	1285	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	450	2	424				0	1198	520	341	2071	0
Arrive On Green	0.28	0.28	0.28				0.00	0.35	0.35	0.28	0.81	0.00
Sat Flow, veh/h	1619	6	1525				0	3510	1484	1619	3510	0
Grp Volume(v), veh/h	392	0	486				0	1238	782	313	1285	0
Grp Sat Flow(s),veh/h/ln	1619	0	1531				0	1710	1484	1619	1710	0
Q Serve(g_s), s	20.8	0.0	25.0				0.0	31.5	31.5	16.9	13.2	0.0
Cycle Q Clear(g_c), s	20.8	0.0	25.0				0.0	31.5	31.5	16.9	13.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	450	0	425				0	1198	520	341	2071	0
V/C Ratio(X)	0.87	0.00	1.14				0.00	1.03	1.50	0.92	0.62	0.00
Avail Cap(c_a), veh/h	450	0	425				0	1198	520	378	2071	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.61	0.61	0.39	0.39	0.00
Uniform Delay (d), s/veh	31.0	0.0	32.5				0.0	29.2	29.2	31.6	4.7	0.0
Incr Delay (d2), s/veh	16.2	0.0	88.8				0.0	29.5	233.0	11.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.0	21.0				0.0	19.7	46.5	8.6	6.0	0.0
LnGrp Delay(d),s/veh	47.2	0.0	121.3				0.0	58.7	262.3	43.4	5.3	0.0
LnGrp LOS	D		F					F	F	D	A	
Approach Vol, veh/h		878						2020			1598	
Approach Delay, s/veh		88.2						137.5			12.8	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.0	37.0		30.0		60.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	18.9	33.5		27.0		15.2		
Green Ext Time (p_c), s	0.1	0.0		0.0		36.6		

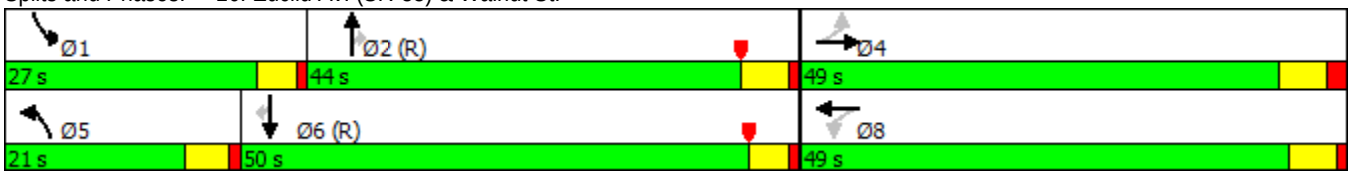
Intersection Summary	
HCM 2010 Ctrl Delay	83.5
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	123	320	99	278	131	1651	67	325	1339	137
Future Volume (vph)	123	320	99	278	131	1651	67	325	1339	137
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	49.0	49.0	49.0	49.0	21.0	44.0	44.0	27.0	50.0	50.0
Total Split (%)	40.8%	40.8%	40.8%	40.8%	17.5%	36.7%	36.7%	22.5%	41.7%	41.7%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.8	26.8	27.8	27.8	14.9	59.0	59.0	18.1	62.5	62.5
Actuated g/C Ratio	0.22	0.22	0.23	0.23	0.12	0.49	0.49	0.15	0.52	0.52
v/c Ratio	0.93	0.62	0.82	0.52	0.68	0.71	0.09	0.76	0.54	0.17
Control Delay	102.7	38.4	83.8	34.7	76.3	8.3	0.3	60.2	22.5	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	38.4	83.8	34.7	76.3	8.3	0.3	60.2	22.5	4.2
LOS	F	D	F	C	E	A	A	E	C	A
Approach Delay		51.9		44.5		12.8			27.9	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 26.7	Intersection LOS: C
Intersection Capacity Utilization 85.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	320	144	99	278	122	131	1651	67	325	1339	137
Future Volume (veh/h)	123	320	144	99	278	122	131	1651	67	325	1339	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	128	333	119	103	290	106	136	1720	47	339	1395	84
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	236	703	246	213	700	250	160	2208	678	391	2357	732
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.13	0.60	0.60	0.13	0.48	0.48
Sat Flow, veh/h	944	2473	867	900	2463	880	1619	4914	1508	2956	4914	1526
Grp Volume(v), veh/h	128	228	224	103	199	197	136	1720	47	339	1395	84
Grp Sat Flow(s),veh/h/ln	944	1710	1631	900	1710	1634	1619	1638	1508	1478	1638	1526
Q Serve(g_s), s	15.3	13.2	13.7	12.9	11.3	11.8	9.9	31.6	1.6	13.5	24.8	3.6
Cycle Q Clear(g_c), s	27.1	13.2	13.7	26.5	11.3	11.8	9.9	31.6	1.6	13.5	24.8	3.6
Prop In Lane	1.00		0.53	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	236	486	463	213	486	464	160	2208	678	391	2357	732
V/C Ratio(X)	0.54	0.47	0.48	0.48	0.41	0.42	0.85	0.78	0.07	0.87	0.59	0.11
Avail Cap(c_a), veh/h	304	608	580	285	623	595	217	2208	678	554	2357	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.75	0.75	0.75
Uniform Delay (d), s/veh	46.0	35.5	35.6	46.6	34.8	35.0	51.3	19.7	13.6	51.0	22.7	17.2
Incr Delay (d2), s/veh	1.9	0.7	0.8	1.7	0.6	0.6	2.3	0.3	0.0	5.8	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	6.4	6.3	3.3	5.4	5.4	4.5	14.1	0.6	5.8	11.3	1.6
LnGrp Delay(d),s/veh	47.9	36.2	36.4	48.3	35.4	35.6	53.6	19.9	13.6	56.8	23.5	17.4
LnGrp LOS	D	D	D	D	D	D	D	B	B	E	C	B
Approach Vol, veh/h		580			499			1903			1818	
Approach Delay, s/veh		38.9			38.1			22.2			29.4	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.4	59.2		40.4	16.7	62.9		40.4
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	22.5	38.7		42.7	16.1	* 46		* 44
Max Q Clear Time (g_c+I1), s	15.5	33.6		29.1	11.9	26.8		28.5
Green Ext Time (p_c), s	0.4	4.8		5.0	0.1	16.1		5.3

Intersection Summary	
HCM 2010 Ctrl Delay	28.6
HCM 2010 LOS	C

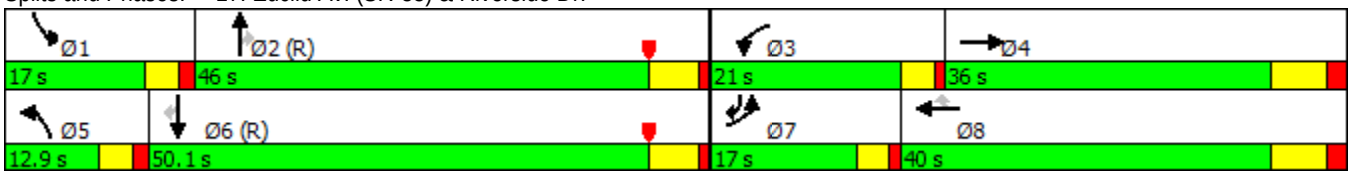
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	149	383	175	344	55	108	1535	275	130	1191	165
Future Volume (vph)	149	383	175	344	55	108	1535	275	130	1191	165
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.9	24.0	16.1	27.1	27.1	12.5	45.0	45.0	14.0	46.4	60.8
Actuated g/C Ratio	0.11	0.20	0.13	0.23	0.23	0.10	0.38	0.38	0.12	0.39	0.51
v/c Ratio	0.92	0.75	0.87	0.48	0.14	0.69	1.29	0.44	0.75	0.97	0.21
Control Delay	104.3	50.0	86.6	41.6	2.1	54.7	173.9	27.0	59.6	55.5	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.3	50.0	86.6	41.6	2.1	54.7	173.9	27.0	59.6	55.5	12.2
LOS	F	D	F	D	A	D	F	C	E	E	B
Approach Delay		63.0		51.6			146.1			51.1	
Approach LOS		E		D			F			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 92.4 — Intersection LOS: F
Intersection Capacity Utilization 95.4% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	383	90	175	344	55	108	1535	275	130	1191	165
Future Volume (veh/h)	149	383	90	175	344	55	108	1535	275	130	1191	165
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	160	412	63	188	370	59	116	1651	165	140	1281	79
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	565	86	212	726	320	113	1377	616	165	1485	821
Arrive On Green	0.11	0.19	0.19	0.13	0.21	0.21	0.02	0.13	0.13	0.03	0.14	0.14
Sat Flow, veh/h	1619	2978	452	1619	3420	1507	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	160	235	240	188	370	59	116	1651	165	140	1281	79
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	1507	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	11.7	15.5	15.7	13.7	11.5	3.9	8.4	48.3	11.6	10.3	43.9	4.4
Cycle Q Clear(g_c), s	11.7	15.5	15.7	13.7	11.5	3.9	8.4	48.3	11.6	10.3	43.9	4.4
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	325	327	212	726	320	113	1377	616	165	1485	821
V/C Ratio(X)	0.91	0.73	0.73	0.89	0.51	0.18	1.02	1.20	0.27	0.85	0.86	0.10
Avail Cap(c_a), veh/h	175	413	416	229	941	414	113	1377	616	169	1485	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.45	0.45	0.45	0.81	0.81	0.81
Uniform Delay (d), s/veh	52.9	45.7	45.8	51.3	41.7	38.7	58.6	52.0	36.1	57.1	47.9	20.5
Incr Delay (d2), s/veh	42.9	5.7	6.0	28.6	0.8	0.4	63.1	93.2	0.5	26.4	5.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	7.8	8.0	7.8	5.5	1.6	5.8	40.7	5.0	5.8	22.0	1.9
LnGrp Delay(d),s/veh	95.8	51.3	51.7	79.8	42.5	39.1	122.0	145.2	36.6	83.4	53.5	20.7
LnGrp LOS	F	D	D	E	D	D	F	F	D	F	D	C
Approach Vol, veh/h		635			617			1932			1500	
Approach Delay, s/veh		62.7			53.6			134.5			54.6	
Approach LOS		E			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	53.8	19.7	29.8	12.9	57.6	17.0	32.5
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	12.3	50.3	15.7	17.7	10.4	45.9	13.7	13.5
Green Ext Time (p_c), s	0.0	0.0	0.0	5.1	0.0	0.0	0.0	6.9

Intersection Summary	
HCM 2010 Ctrl Delay	88.5
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	69	173	50	72	96	63	1867	210	15	1331	62
Future Volume (vph)	69	173	50	72	96	63	1867	210	15	1331	62
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	9.0	69.8	69.8	9.2	70.0	70.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	34.2%	7.5%	58.2%	58.2%	7.7%	58.3%	58.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.8	22.8	22.8		22.8	9.1	80.2	80.2	5.7	71.6	71.6
Actuated g/C Ratio	0.19	0.19	0.19		0.19	0.08	0.67	0.67	0.05	0.60	0.60
v/c Ratio	0.41	0.52	0.15		0.85	0.53	0.84	0.21	0.20	0.67	0.07
Control Delay	47.3	47.8	8.5		75.3	56.4	25.2	6.9	78.2	4.8	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	47.8	8.5		75.3	56.4	25.2	6.9	78.2	4.8	0.1
LOS	D	D	A		E	E	C	A	E	A	A
Approach Delay		40.9			75.3		24.3			5.3	
Approach LOS		D			E		C			A	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 21.3 — Intersection LOS: C
Intersection Capacity Utilization 95.8% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	173	50	72	96	23	63	1867	210	15	1331	62
Future Volume (veh/h)	69	173	50	72	96	23	63	1867	210	15	1331	62
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	71	178	33	74	99	20	65	1925	160	15	1372	35
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	222	381	324	113	138	24	74	2169	971	27	2069	906
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.09	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1221	1800	1530	336	650	114	1619	3420	1530	1619	3420	1498
Grp Volume(v), veh/h	71	178	33	193	0	0	65	1925	160	15	1372	35
Grp Sat Flow(s),veh/h/ln	1221	1800	1530	1099	0	0	1619	1710	1530	1619	1710	1498
Q Serve(g_s), s	0.0	10.4	2.1	11.3	0.0	0.0	4.8	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.9	10.4	2.1	21.7	0.0	0.0	4.8	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	222	381	324	274	0	0	74	2169	971	27	2069	906
V/C Ratio(X)	0.32	0.47	0.10	0.70	0.00	0.00	0.88	0.89	0.16	0.57	0.66	0.04
Avail Cap(c_a), veh/h	310	510	433	380	0	0	74	2169	971	77	2069	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.19	0.19	0.19
Uniform Delay (d), s/veh	41.6	41.4	38.1	47.3	0.0	0.0	54.2	0.0	0.0	57.6	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.9	0.1	3.5	0.0	0.0	10.1	0.6	0.0	1.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.2	0.9	6.5	0.0	0.0	2.3	0.2	0.0	0.5	0.1	0.0
LnGrp Delay(d),s/veh	42.4	42.3	38.2	50.8	0.0	0.0	64.2	0.6	0.0	59.0	0.3	0.0
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		282			193			2150			1422	
Approach Delay, s/veh		41.8			50.8			2.5			0.9	
Approach LOS		D			D			A			A	

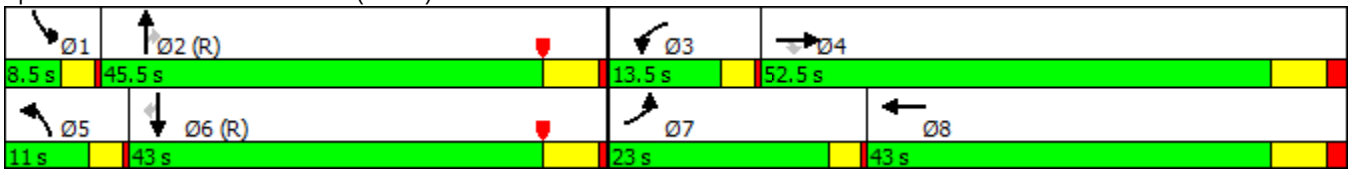
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	82.1		32.4	9.0	78.6		32.4
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	63.8		34.0	5.5	64.0		34.0
Max Q Clear Time (g_c+I1), s	3.1	2.0		12.9	6.8	2.0		23.7
Green Ext Time (p_c), s	0.0	49.4		2.3	0.0	49.5		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	7.0
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	300	225	187	27	49	120	1841	41	22	1321	132
Future Volume (vph)	300	225	187	27	49	120	1841	41	22	1321	132
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	27.1	27.1	10.0	14.6	16.2	66.0	66.0	5.7	52.0	52.0
Actuated g/C Ratio	0.16	0.23	0.23	0.08	0.12	0.14	0.55	0.55	0.05	0.43	0.43
v/c Ratio	1.18	0.57	0.39	0.21	0.30	0.57	1.01	0.05	0.30	0.92	0.19
Control Delay	157.0	45.7	6.5	55.4	38.2	43.2	42.9	2.7	73.0	34.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	157.0	45.7	6.5	55.4	38.2	43.2	42.9	2.7	73.0	34.0	5.1
LOS	F	D	A	E	D	D	D	A	E	C	A
Approach Delay		82.2			43.3		42.1			32.0	
Approach LOS		F			D		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 45.3	Intersection LOS: D
Intersection Capacity Utilization 97.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	225	187	27	49	15	120	1841	41	22	1321	132
Future Volume (veh/h)	300	225	187	27	49	15	120	1841	41	22	1321	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	309	232	117	28	51	10	124	1898	33	23	1362	83
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	315	267	82	92	18	101	2003	896	36	1866	816
Arrive On Green	0.16	0.17	0.17	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1463	287	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	309	232	117	28	0	61	124	1898	33	23	1362	83
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1749	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	14.7	8.2	2.0	0.0	4.1	7.5	65.8	2.1	1.7	45.1	5.6
Cycle Q Clear(g_c), s	19.5	14.7	8.2	2.0	0.0	4.1	7.5	65.8	2.1	1.7	45.1	5.6
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	315	267	82	0	110	101	2003	896	36	1866	816
V/C Ratio(X)	1.17	0.74	0.44	0.34	0.00	0.55	1.23	0.95	0.04	0.64	0.73	0.10
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	2003	896	67	1866	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.71	0.71	0.71
Uniform Delay (d), s/veh	50.3	46.9	44.2	55.0	0.0	54.6	58.8	46.6	20.9	59.1	40.9	24.6
Incr Delay (d2), s/veh	111.1	2.5	0.8	0.9	0.0	3.2	109.5	1.4	0.0	4.8	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.8	7.5	3.5	0.9	0.0	2.1	6.4	31.6	0.9	0.8	21.9	2.3
LnGrp Delay(d),s/veh	161.3	49.4	45.1	56.0	0.0	57.8	168.3	48.0	20.9	63.9	42.7	24.8
LnGrp LOS	F	D	D	E		E	F	D	C	E	D	C
Approach Vol, veh/h		658			89			2055			1468	
Approach Delay, s/veh		101.2			57.2			54.8			42.0	
Approach LOS		F			E			D			D	

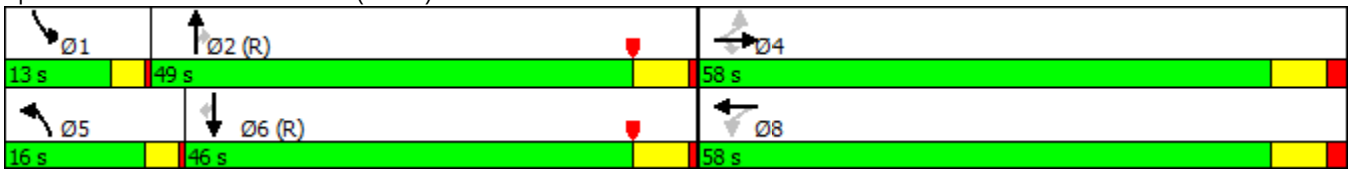
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	76.3	9.6	28.0	11.0	71.5	23.0	14.5
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.7	67.8	4.0	16.7	9.5	47.1	21.5	6.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	57.6
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	343	471	280	28	140	171	1594	77	68	1292	169
Future Volume (vph)	343	471	280	28	140	171	1594	77	68	1292	169
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.5	44.5	44.5	44.5	44.5	16.0	52.5	52.5	8.3	43.0	43.0
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.13	0.44	0.44	0.07	0.36	0.36
v/c Ratio	0.88	0.72	0.41	0.18	0.27	0.81	1.09	0.11	0.62	1.08	0.28
Control Delay	58.2	38.4	8.4	25.6	24.3	58.2	80.6	13.2	87.4	68.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	38.4	8.4	25.6	24.3	58.2	80.6	13.2	87.4	68.1	4.9
LOS	E	D	A	C	C	E	F	B	F	E	A
Approach Delay		36.9			24.5		75.7			62.0	
Approach LOS		D			C		E			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 59.9	Intersection LOS: E
Intersection Capacity Utilization 101.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	343	471	280	28	140	30	171	1594	77	68	1292	169
Future Volume (veh/h)	343	471	280	28	140	30	171	1594	77	68	1292	169
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	350	481	194	29	143	26	174	1627	59	69	1318	145
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	447	712	597	188	587	107	169	1416	634	85	1240	555
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.03	0.14	0.14	0.11	0.73	0.73
Sat Flow, veh/h	1167	1800	1509	732	1483	270	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	350	481	194	29	0	169	174	1627	59	69	1318	145
Grp Sat Flow(s),veh/h/ln	1167	1800	1509	732	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	34.4	26.4	10.7	4.1	0.0	7.7	12.5	49.7	4.0	5.0	43.5	3.9
Cycle Q Clear(g_c), s	42.1	26.4	10.7	30.5	0.0	7.7	12.5	49.7	4.0	5.0	43.5	3.9
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	712	597	188	0	693	169	1416	634	85	1240	555
V/C Ratio(X)	0.78	0.68	0.32	0.15	0.00	0.24	1.03	1.15	0.09	0.81	1.06	0.26
Avail Cap(c_a), veh/h	481	765	641	210	0	745	169	1416	634	128	1240	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.64	0.64	0.64	0.43	0.43	0.43
Uniform Delay (d), s/veh	38.3	29.9	25.1	42.5	0.0	24.2	57.9	51.8	32.1	53.1	16.5	11.0
Incr Delay (d2), s/veh	7.8	2.2	0.3	0.4	0.0	0.2	64.1	72.7	0.2	5.5	36.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	13.5	4.5	0.8	0.0	3.8	8.6	37.8	1.8	2.4	25.9	1.7
LnGrp Delay(d),s/veh	46.1	32.1	25.5	42.9	0.0	24.4	122.3	124.5	32.3	58.6	52.9	11.5
LnGrp LOS	D	C	C	D		C	F	F	C	E	F	B
Approach Vol, veh/h		1025			198			1860			1532	
Approach Delay, s/veh		35.6			27.1			121.4			49.2	
Approach LOS		D			C			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	55.7		54.5	16.0	49.5		54.5
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	7.0	51.7		44.1	14.5	45.5		32.5
Green Ext Time (p_c), s	0.0	0.0		3.4	0.0	0.0		5.8

Intersection Summary		
HCM 2010 Ctrl Delay		74.3
HCM 2010 LOS		E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	49	28	207	7	12	143	1726	13	10	1573	50
Future Volume (vph)	49	28	207	7	12	143	1726	13	10	1573	50
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.7	15.7	15.7	15.7	15.7	15.9	92.1	92.1	5.5	74.4	74.4
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.05	0.62	0.62
v/c Ratio	0.32	0.13	0.64	0.05	0.11	0.72	0.71	0.01	0.15	0.81	0.06
Control Delay	47.5	41.0	19.5	37.1	25.5	58.8	10.8	0.0	70.5	12.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	41.0	19.5	37.1	25.5	58.8	10.8	0.0	70.5	12.3	0.1
LOS	D	D	B	D	C	E	B	A	E	B	A
Approach Delay		26.4			28.4		14.4			12.3	
Approach LOS		C			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	28	207	7	12	10	143	1726	13	10	1573	50
Future Volume (veh/h)	49	28	207	7	12	10	143	1726	13	10	1573	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	53	30	120	8	13	9	155	1876	13	11	1710	54
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	177	151	159	98	68	175	2641	1181	21	2314	1012
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.77	0.77	0.03	1.00	1.00
Sat Flow, veh/h	1333	1800	1530	1187	992	687	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	53	30	120	8	0	22	155	1876	13	11	1710	54
Grp Sat Flow(s),veh/h/ln	1333	1800	1530	1187	0	1679	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.5	1.8	9.2	0.7	0.0	1.4	11.3	33.2	0.2	0.8	0.0	0.0
Cycle Q Clear(g_c), s	6.0	1.8	9.2	2.6	0.0	1.4	11.3	33.2	0.2	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	177	151	159	0	165	175	2641	1181	21	2314	1012
V/C Ratio(X)	0.30	0.17	0.80	0.05	0.00	0.13	0.88	0.71	0.01	0.53	0.74	0.05
Avail Cap(c_a), veh/h	511	630	535	457	0	588	175	2641	1181	67	2314	1012
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.22	0.22	0.22
Uniform Delay (d), s/veh	52.1	49.6	52.9	50.8	0.0	49.4	52.8	6.9	3.1	58.1	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.3	7.0	0.1	0.0	0.3	36.8	1.7	0.0	3.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.9	4.2	0.2	0.0	0.7	6.9	16.0	0.1	0.4	0.2	0.0
LnGrp Delay(d),s/veh	52.9	49.9	59.9	50.9	0.0	49.7	89.6	8.6	3.2	61.6	0.5	0.0
LnGrp LOS	D	D	E	D		D	F	A	A	E	A	A
Approach Vol, veh/h		203			30			2044			1775	
Approach Delay, s/veh		56.6			50.0			14.7			0.9	
Approach LOS		E			D			B			A	

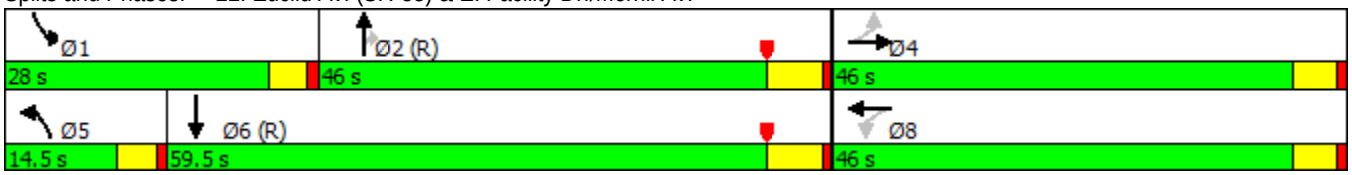
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	98.4		16.6	16.5	86.9		16.6
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.8	35.2		11.2	13.3	2.0		4.6
Green Ext Time (p_c), s	0.0	22.2		0.6	0.0	42.8		0.6

Intersection Summary		
HCM 2010 Ctrl Delay		11.0
HCM 2010 LOS		B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	21	179	0	2	1468	343	682	1088
Future Volume (vph)	5	21	179	0	2	1468	343	682	1088
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	10.0	40.0	40.0	23.5	65.1
Actuated g/C Ratio		0.34		0.34	0.08	0.33	0.33	0.20	0.54
v/c Ratio		0.07		1.19	0.01	1.38	0.65	2.32	0.63
Control Delay		20.8		132.9	72.5	198.4	12.1	620.5	26.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.8		132.9	72.5	198.4	12.1	620.5	26.0
LOS		C		F	E	F	B	F	C
Approach Delay		20.8		132.9		163.0			254.8
Approach LOS		C		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.32	
Intersection Signal Delay: 195.5	Intersection LOS: F
Intersection Capacity Utilization 144.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	11	179	0	453	2	1468	343	682	1088	1
Future Volume (veh/h)	5	21	11	179	0	453	2	1468	343	682	1088	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	23	4	192	0	459	2	1578	340	733	1170	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	88	379	62	188	2	361	9	1140	499	317	1837	2
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.33	0.33	0.20	0.52	0.52
Sat Flow, veh/h	156	1109	181	435	7	1057	1619	3420	1496	1619	3506	3
Grp Volume(v), veh/h	32	0	0	651	0	0	2	1578	340	733	571	600
Grp Sat Flow(s),veh/h/ln	1445	0	0	1499	0	0	1619	1710	1496	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	39.5	0.0	0.0	0.1	40.0	23.5	23.5	28.6	28.6
Cycle Q Clear(g_c), s	1.5	0.0	0.0	41.0	0.0	0.0	0.1	40.0	23.5	23.5	28.6	28.6
Prop In Lane	0.16		0.12	0.29		0.71	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	529	0	0	551	0	0	9	1140	499	317	896	943
V/C Ratio(X)	0.06	0.00	0.00	1.18	0.00	0.00	0.23	1.38	0.68	2.31	0.64	0.64
Avail Cap(c_a), veh/h	529	0	0	551	0	0	135	1140	499	317	896	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	40.9	0.0	0.0	59.4	40.0	34.5	48.3	20.4	20.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	99.3	0.0	0.0	0.4	173.4	0.7	600.2	3.5	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	33.4	0.0	0.0	0.1	46.3	9.8	63.3	14.3	15.0
LnGrp Delay(d),s/veh	26.5	0.0	0.0	140.1	0.0	0.0	59.9	213.4	35.2	648.4	23.9	23.7
LnGrp LOS	C			F			E	F	D	F	C	C
Approach Vol, veh/h		32			651			1920			1904	
Approach Delay, s/veh		26.5			140.1			181.7			264.3	
Approach LOS		C			F			F			F	

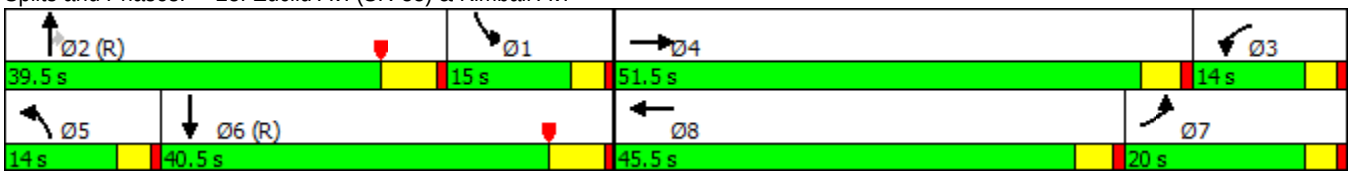
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.0	46.0		46.0	5.1	68.9		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	25.5	42.0		3.5	2.1	30.6		43.0
Green Ext Time (p_c), s	0.0	0.0		3.0	0.0	18.9		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		209.5	
HCM 2010 LOS		F	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	619	798	216	373	124	803	157	262	869
Future Volume (vph)	619	798	216	373	124	803	157	262	869
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	29.0	39.5	17.5	28.0	10.0	32.6	32.6	11.9	34.5
Actuated g/C Ratio	0.24	0.33	0.15	0.23	0.08	0.27	0.27	0.10	0.29
v/c Ratio	1.65	0.82	0.96	0.82	0.96	0.90	0.31	1.71	1.15
Control Delay	335.7	42.8	101.0	38.6	96.6	45.4	13.0	366.3	107.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	335.7	42.8	101.0	38.6	96.6	45.4	13.0	366.3	107.6
LOS	F	D	F	D	F	D	B	F	F
Approach Delay		163.9		53.2		46.5			158.6
Approach LOS		F		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.71	
Intersection Signal Delay: 115.0	Intersection LOS: F
Intersection Capacity Utilization 116.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	619	798	81	216	373	337	124	803	157	262	869	198
Future Volume (veh/h)	619	798	81	216	373	337	124	803	157	262	869	198
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	645	831	80	225	389	317	129	836	149	273	905	188
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	231	960	92	135	442	356	135	922	413	278	1054	219
Arrive On Green	0.14	0.30	0.30	0.08	0.25	0.25	0.03	0.09	0.09	0.17	0.37	0.37
Sat Flow, veh/h	1619	3153	304	1619	1801	1453	1619	3420	1530	1619	2814	584
Grp Volume(v), veh/h	645	451	460	225	369	337	129	836	149	273	550	543
Grp Sat Flow(s),veh/h/ln	1619	1710	1746	1619	1710	1544	1619	1710	1530	1619	1710	1688
Q Serve(g_s), s	17.1	29.9	29.9	10.0	24.9	25.3	9.5	29.1	11.0	20.2	35.6	35.6
Cycle Q Clear(g_c), s	17.1	29.9	29.9	10.0	24.9	25.3	9.5	29.1	11.0	20.2	35.6	35.6
Prop In Lane	1.00		0.17	1.00		0.94	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	231	521	532	135	420	379	135	922	413	278	641	632
V/C Ratio(X)	2.80	0.87	0.87	1.67	0.88	0.89	0.96	0.91	0.36	0.98	0.86	0.86
Avail Cap(c_a), veh/h	231	670	684	135	584	527	135	955	427	278	641	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.41	0.41	0.41	1.00	1.00	1.00	0.45	0.45	0.45	0.73	0.73	0.73
Uniform Delay (d), s/veh	51.4	39.4	39.4	55.0	43.6	43.7	58.1	53.2	44.9	49.5	34.6	34.6
Incr Delay (d2), s/veh	812.7	4.2	4.1	330.7	8.7	10.6	40.0	7.3	1.1	41.5	10.7	10.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	59.7	14.7	15.1	16.9	12.8	11.9	5.8	14.7	4.8	12.2	18.7	18.5
LnGrp Delay(d),s/veh	864.2	43.6	43.5	385.7	52.3	54.3	98.1	60.4	46.0	91.0	45.3	45.5
LnGrp LOS	F	D	D	F	D	D	F	E	D	F	D	D
Approach Vol, veh/h		1556			931			1114			1366	
Approach Delay, s/veh		383.7			133.6			62.9			54.5	
Approach LOS		F			F			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.6	38.4	14.0	41.0	14.0	51.0	21.1	33.9
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	22.2	31.1	12.0	31.9	11.5	37.6	19.1	27.3
Green Ext Time (p_c), s	0.0	1.3	0.0	4.7	0.0	0.0	0.0	2.2

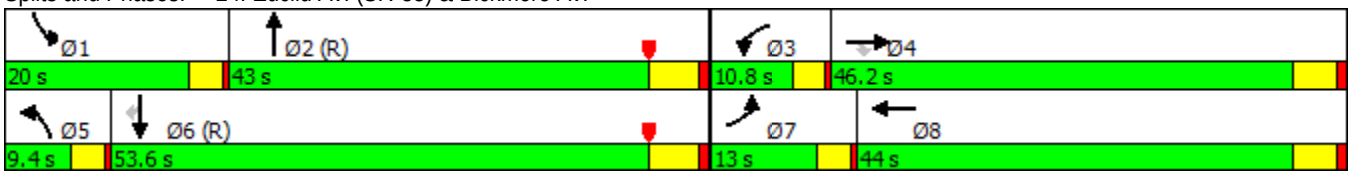
Intersection Summary		
HCM 2010 Ctrl Delay		174.3
HCM 2010 LOS		F

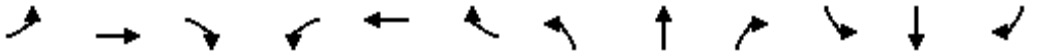
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	115	118	118	116	42	47	856	215	837	77
Future Volume (vph)	115	118	118	116	42	47	856	215	837	77
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.5	17.7	17.7	7.3	15.5	7.4	52.9	24.6	71.8	71.8
Actuated g/C Ratio	0.08	0.15	0.15	0.06	0.13	0.06	0.44	0.20	0.60	0.60
v/c Ratio	1.01	0.49	0.39	1.32	0.57	0.53	0.81	0.72	0.45	0.09
Control Delay	137.2	50.6	9.0	241.0	21.5	81.0	14.3	57.8	5.1	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.2	50.6	9.0	241.0	21.5	81.0	14.3	57.8	5.1	0.8
LOS	F	D	A	F	C	F	B	E	A	A
Approach Delay		65.1			113.7		17.1		14.9	
Approach LOS		E			F		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.32	
Intersection Signal Delay: 31.4	Intersection LOS: C
Intersection Capacity Utilization 78.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	118	118	116	42	118	47	856	212	215	837	77
Future Volume (veh/h)	115	118	118	116	42	118	47	856	212	215	837	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	128	131	112	129	47	119	52	951	226	239	930	86
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	128	263	223	98	58	146	65	1393	330	223	2077	910
Arrive On Green	0.08	0.15	0.15	0.06	0.13	0.13	0.05	0.68	0.68	0.28	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	452	1145	1619	2732	648	1619	3420	1498
Grp Volume(v), veh/h	128	131	112	129	0	166	52	595	582	239	930	86
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1598	1619	1710	1670	1619	1710	1498
Q Serve(g_s), s	9.5	8.0	8.1	7.3	0.0	12.1	3.8	25.0	25.1	16.5	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.0	8.1	7.3	0.0	12.1	3.8	25.0	25.1	16.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.72	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	128	263	223	98	0	204	65	872	851	223	2077	910
V/C Ratio(X)	1.00	0.50	0.50	1.31	0.00	0.81	0.81	0.68	0.68	1.07	0.45	0.09
Avail Cap(c_a), veh/h	128	618	525	98	0	519	80	872	851	223	2077	910
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.2	47.2	47.2	56.3	0.0	50.9	56.4	13.5	13.5	43.5	0.0	0.0
Incr Delay (d2), s/veh	79.0	0.5	0.6	194.7	0.0	3.0	3.6	0.4	0.4	41.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	4.0	3.5	8.6	0.0	5.5	1.8	11.8	11.5	9.9	0.0	0.0
LnGrp Delay(d),s/veh	134.3	47.7	47.9	251.1	0.0	53.9	60.0	13.9	13.9	85.1	0.1	0.0
LnGrp LOS	F	D	D	F		D	E	B	B	F	A	A
Approach Vol, veh/h		371			295			1229			1255	
Approach Delay, s/veh		77.6			140.1			15.9			16.2	
Approach LOS		E			F			B			B	

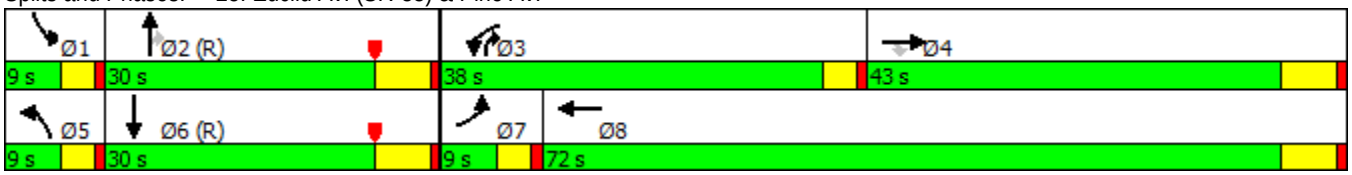
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	66.7	10.8	22.5	8.3	78.4	13.0	20.3
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	18.5	27.1	9.3	10.1	5.8	2.0	11.5	14.1
Green Ext Time (p_c), s	0.0	6.0	0.0	1.2	0.0	10.9	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	339	29	475	77	34	987	1074	112	908
Future Volume (vph)	15	339	29	475	77	34	987	1074	112	908
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	29.2	29.2	34.0	63.6	6.3	24.0	64.0	12.8	34.3
Actuated g/C Ratio	0.04	0.24	0.24	0.28	0.53	0.05	0.20	0.53	0.11	0.29
v/c Ratio	0.22	0.80	0.06	0.59	0.16	0.41	1.49	1.20	0.67	0.98
Control Delay	63.7	56.0	0.2	40.4	8.9	66.9	254.0	113.3	57.4	58.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	56.0	0.2	40.4	8.9	66.9	254.0	113.3	57.4	58.9
LOS	E	E	A	D	A	E	F	F	E	E
Approach Delay		52.0			33.3		178.8			58.7
Approach LOS		D			C		F			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.49	
Intersection Signal Delay: 115.3	Intersection LOS: F
Intersection Capacity Utilization 107.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	339	29	475	77	62	34	987	1074	112	908	15
Future Volume (veh/h)	15	339	29	475	77	62	34	987	1074	112	908	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	349	0	490	79	58	35	1018	674	115	936	11
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	409	347	547	382	281	46	1298	864	67	1359	16
Arrive On Green	0.02	0.23	0.00	0.19	0.40	0.40	0.03	0.38	0.38	0.01	0.13	0.13
Sat Flow, veh/h	1619	1800	1530	2956	966	709	1619	3420	1530	1619	3461	41
Grp Volume(v), veh/h	15	349	0	490	0	137	35	1018	674	115	462	485
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1675	1619	1710	1530	1619	1710	1792
Q Serve(g_s), s	1.1	22.3	0.0	19.4	0.0	6.5	2.6	31.6	41.1	5.0	31.0	31.0
Cycle Q Clear(g_c), s	1.1	22.3	0.0	19.4	0.0	6.5	2.6	31.6	41.1	5.0	31.0	31.0
Prop In Lane	1.00		1.00	1.00		0.42	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	27	409	347	547	0	663	46	1298	864	67	671	703
V/C Ratio(X)	0.57	0.85	0.00	0.90	0.00	0.21	0.75	0.78	0.78	1.70	0.69	0.69
Avail Cap(c_a), veh/h	67	555	472	838	0	921	67	1298	864	67	671	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.82	0.82	0.82
Uniform Delay (d), s/veh	58.6	44.5	0.0	47.8	0.0	23.9	57.9	32.9	20.3	59.2	45.2	45.2
Incr Delay (d2), s/veh	6.8	10.8	0.0	5.9	0.0	0.2	1.2	0.5	0.7	363.5	4.7	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.3	0.0	8.4	0.0	3.0	1.2	14.9	17.4	9.1	15.6	16.3
LnGrp Delay(d),s/veh	65.4	55.2	0.0	53.7	0.0	24.1	59.1	33.3	21.0	422.7	50.0	49.8
LnGrp LOS	E	E		D		C	E	C	C	F	D	D
Approach Vol, veh/h		364			627			1727			1062	
Approach Delay, s/veh		55.6			47.2			29.0			90.2	
Approach LOS		E			D			C			F	

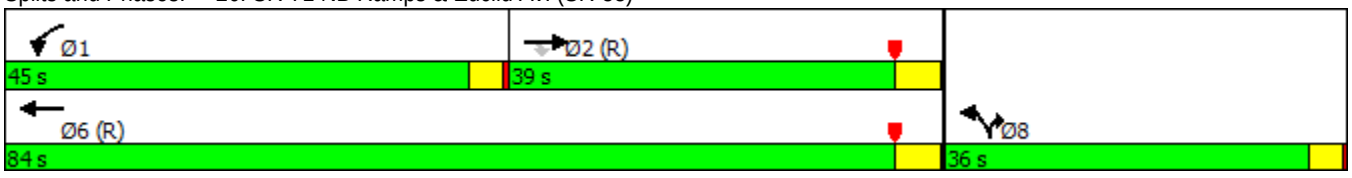
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	51.5	26.2	33.2	7.4	53.1	6.0	53.5
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	43.1	21.4	24.3	4.6	33.0	3.1	8.5
Green Ext Time (p_c), s	0.0	0.0	0.8	2.9	0.0	0.0	0.0	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	51.8
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	828	177	310	1150	152	1359
Future Volume (vph)	828	177	310	1150	152	1359
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	39.0	39.0	45.0	84.0	36.0	36.0
Total Split (%)	32.5%	32.5%	37.5%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	47.1	47.1	28.9	79.5	32.5	32.5
Actuated g/C Ratio	0.39	0.39	0.24	0.66	0.27	0.27
v/c Ratio	0.69	0.28	0.83	0.56	0.19	1.77
Control Delay	36.9	10.5	61.4	3.4	34.3	370.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	10.5	61.4	3.4	34.3	370.2
LOS	D	B	E	A	C	F
Approach Delay	32.2			15.7	336.4	
Approach LOS	C			B	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.77	
Intersection Signal Delay: 141.8	Intersection LOS: F
Intersection Capacity Utilization 120.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	828	177	310	1150	152	1359
Future Volume (veh/h)	828	177	310	1150	152	1359
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	920	0	344	1278	169	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2109	944	372	2950	235	108
Arrive On Green	1.00	0.00	0.22	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	920	0	344	1278	169	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	23.6	9.8	6.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	23.6	9.8	6.0	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2109	944	372	2950	235	108
V/C Ratio(X)	0.44	0.00	0.93	0.43	0.72	0.00
Avail Cap(c_a), veh/h	2109	944	593	2950	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.45	0.45	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	46.0	1.8	54.6	0.0
Incr Delay (d2), s/veh	0.7	0.0	5.4	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	11.7	4.5	2.9	0.0
LnGrp Delay(d),s/veh	0.7	0.0	51.4	2.0	58.7	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	920			1622	169	
Approach Delay, s/veh	0.7			12.5	58.7	
Approach LOS	A			B	E	

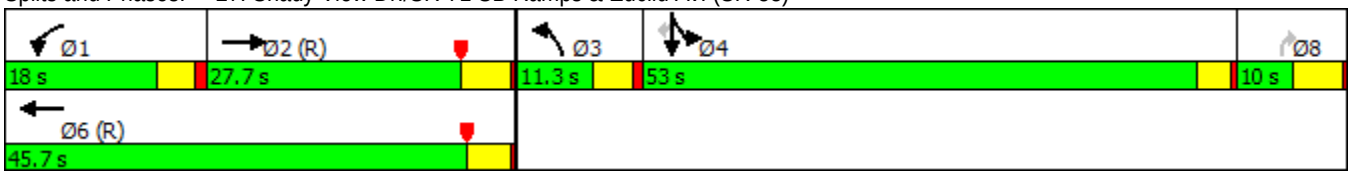
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	29.5	78.5				108.0		12.0
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	41.5	34.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	25.6	2.0				11.8		8.0
Green Ext Time (p_c), s	0.4	16.5				21.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	318	101	236	30	16	741	144	156
Future Volume (vph)	318	101	236	30	16	741	144	156
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	27.7	18.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.1%	15.0%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	36.2	12.0	53.1	6.5	5.0	42.1	42.1	42.1
Actuated g/C Ratio	0.30	0.10	0.44	0.05	0.04	0.35	0.35	0.35
v/c Ratio	0.37	0.65	0.16	0.36	0.08	0.84	0.79	0.25
Control Delay	37.0	64.9	11.3	66.2	0.9	49.8	45.2	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	64.9	11.3	66.2	0.9	49.8	45.2	4.4
LOS	D	E	B	E	A	D	D	A
Approach Delay	37.0		27.4				41.0	
Approach LOS	D		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 37.7	Intersection LOS: D
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	318	44	101	236	0	30	0	16	741	144	156
Future Volume (veh/h)	0	318	44	101	236	0	30	0	16	741	144	156
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	328	45	104	243	0	31	0	16	870	0	161
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1548	211	125	2142	0	0	0	0	981	0	464
Arrive On Green	0.00	0.51	0.51	0.15	1.00	0.00	0.00	0.00	0.00	0.30	0.00	0.30
Sat Flow, veh/h	0	3116	412	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	184	189	104	243	0		0.0		870	0	161
Grp Sat Flow(s),veh/h/ln	0	1710	1727	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	7.1	7.2	7.5	0.0	0.0				30.7	0.0	9.8
Cycle Q Clear(g_c), s	0.0	7.1	7.2	7.5	0.0	0.0				30.7	0.0	9.8
Prop In Lane	0.00		0.24	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	875	884	125	2142	0				981	0	464
V/C Ratio(X)	0.00	0.21	0.21	0.83	0.11	0.00				0.89	0.00	0.35
Avail Cap(c_a), veh/h	0	875	884	182	2142	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.0	16.1	50.0	0.0	0.0				39.9	0.0	32.6
Incr Delay (d2), s/veh	0.0	0.5	0.6	18.8	0.1	0.0				5.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.5	3.5	4.0	0.0	0.0				14.6	0.0	4.2
LnGrp Delay(d),s/veh	0.0	16.6	16.6	68.8	0.1	0.0				45.7	0.0	33.0
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		373			347						1031	
Approach Delay, s/veh		16.6			20.7						43.7	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.8	66.4		39.9		80.1		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	13.5	22.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.5	9.2		32.7		2.0		
Green Ext Time (p_c), s	0.1	2.0		3.6		2.5		

Intersection Summary	
HCM 2010 Ctrl Delay	33.4
HCM 2010 LOS	C

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1187	36	6	876	108	18
Future Volume (vph)	1187	36	6	876	108	18
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	72.7	72.7	5.0	74.3	14.3	14.3
Actuated g/C Ratio	0.73	0.73	0.05	0.74	0.14	0.14
v/c Ratio	0.99	0.03	0.09	0.71	0.51	0.09
Control Delay	37.6	3.3	52.5	12.0	47.5	15.7
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	37.6	3.3	52.5	12.4	47.5	15.7
LOS	D	A	D	B	D	B
Approach Delay	36.6			12.7	42.9	
Approach LOS	D			B	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 27.5	Intersection LOS: C
Intersection Capacity Utilization 83.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1187	36	6	876	108	18
Future Volume (veh/h)	1187	36	6	876	108	18
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1290	39	7	952	117	20
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1310	1114	14	1410	165	156
Arrive On Green	0.73	0.73	0.01	0.78	0.10	0.10
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1290	39	7	952	117	20
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	67.7	0.7	0.4	23.9	6.9	1.2
Cycle Q Clear(g_c), s	67.7	0.7	0.4	23.9	6.9	1.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1310	1114	14	1410	165	156
V/C Ratio(X)	0.98	0.04	0.49	0.68	0.71	0.13
Avail Cap(c_a), veh/h	1319	1121	82	1495	444	420
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	3.7	48.5	4.9	42.8	40.2
Incr Delay (d2), s/veh	21.0	0.0	9.3	1.1	5.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	40.6	0.3	0.2	12.1	3.3	0.5
LnGrp Delay(d),s/veh	33.9	3.7	57.8	6.0	48.4	40.6
LnGrp LOS	C	A	E	A	D	D
Approach Vol, veh/h	1329			959	137	
Approach Delay, s/veh	33.0			6.4	47.2	
Approach LOS	C			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.5	77.8				83.3		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.4	69.7				25.9		8.9
Green Ext Time (p_c), s	0.0	1.9				8.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	23.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	22	0	126	39	3
Future Vol, veh/h	0	22	0	126	39	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	24	0	137	42	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	44	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	1032	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	1032	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1032	-	-
HCM Lane V/C Ratio	-	0.023	-	-
HCM Control Delay (s)	-	8.6	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	1	1	114	58	3
Future Vol, veh/h	12	1	1	114	58	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	1	1	124	63	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	191	65	66	0	-	0
Stage 1	65	-	-	-	-	-
Stage 2	126	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	803	1005	1549	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	802	1005	1549	-	-	-
Mov Cap-2 Maneuver	789	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1549	-	802	-	-
HCM Lane V/C Ratio	0.001	-	0.018	-	-
HCM Control Delay (s)	7.3	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	1	7	78	47	12
Future Vol, veh/h	37	1	7	78	47	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	40	1	8	85	51	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	158	58	64	0	-	0
Stage 1	58	-	-	-	-	-
Stage 2	100	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	838	1014	1551	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	834	1014	1551	-	-	-
Mov Cap-2 Maneuver	811	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	924	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1551	-	815	-	-
HCM Lane V/C Ratio	0.005	-	0.051	-	-
HCM Control Delay (s)	7.3	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	5	2	52	38	9
Future Vol, veh/h	32	5	2	52	38	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	35	5	2	57	41	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	107	46	51	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	61	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	877	1029	1568	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	876	1029	1568	-	-	-
Mov Cap-2 Maneuver	839	-	-	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1568	-	860	-	-
HCM Lane V/C Ratio	0.001	-	0.047	-	-
HCM Control Delay (s)	7.3	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	5	2	24	33	10
Future Vol, veh/h	30	5	2	24	33	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	5	2	26	36	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	71	41	47	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	938	1036	1573	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	937	1036	1573	-	-	-
Mov Cap-2 Maneuver	880	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	997	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1573	-	899	-	-
HCM Lane V/C Ratio	0.001	-	0.042	-	-
HCM Control Delay (s)	7.3	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	2	1	11	34	5
Future Vol, veh/h	14	2	1	11	34	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	15	2	1	12	37	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	54	40	42	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	959	1037	1580	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	958	1037	1580	-	-	-
Mov Cap-2 Maneuver	892	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	1013	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1580	-	908	-	-
HCM Lane V/C Ratio	0.001	-	0.019	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	397	204	2	6	30
Future Vol, veh/h	10	397	204	2	6	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	432	222	2	7	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	222	0	-	0	675	222
Stage 1	-	-	-	-	222	-
Stage 2	-	-	-	-	453	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1359	-	-	-	422	823
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	645	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1359	-	-	-	419	823
Mov Cap-2 Maneuver	-	-	-	-	573	-
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	640	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1359	-	-	-	573	823
HCM Lane V/C Ratio	0.008	-	-	-	0.011	0.04
HCM Control Delay (s)	7.7	-	-	-	11.4	9.6
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1205	0	0	882	0	0	0	0	0	0	0
Future Vol, veh/h	0	1205	0	0	882	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1268	0	0	928	0	0	0	0	0	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	928	0	-	-	-	0				1562	2196	928
Stage 1	-	-	-	-	-	-				928	928	-
Stage 2	-	-	-	-	-	-				634	1268	-
Critical Hdwy	4.1	-	-	-	-	-				6.6	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.8	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	745	-	0	0	-	-				114	46	328
Stage 1	-	-	0	0	-	-				388	349	-
Stage 2	-	-	0	0	-	-				496	242	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	745	-	-	-	-	-				114	0	328
Mov Cap-2 Maneuver	-	-	-	-	-	-				308	0	-
Stage 1	-	-	-	-	-	-				388	0	-
Stage 2	-	-	-	-	-	-				496	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	745	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1129	86	27	830	37	20
Future Vol, veh/h	1129	86	27	830	37	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1214	92	29	892	40	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1306	0	2211	653
Stage 1	-	-	-	-	1260	-
Stage 2	-	-	-	-	951	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	537	-	43	415
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	379	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	537	-	41	415
Mov Cap-2 Maneuver	-	-	-	-	188	-
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	359	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	23.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	188	415	-	-	537	-
HCM Lane V/C Ratio	0.212	0.052	-	-	0.054	-
HCM Control Delay (s)	29.2	14.1	-	-	12.1	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.8	0.2	-	-	0.2	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1019	38	776	79	22
Future Volume (vph)	1019	38	776	79	22
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.3	5.2	27.5	10.5	10.5
Actuated g/C Ratio	0.49	0.10	0.55	0.21	0.21
v/c Ratio	0.73	0.24	0.82	0.24	0.07
Control Delay	13.4	28.2	16.2	22.3	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	28.2	16.2	22.3	11.0
LOS	B	C	B	C	B
Approach Delay	13.4		16.8	19.8	
Approach LOS	B		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 49.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1019	130	38	776	79	22
Future Volume (veh/h)	1019	130	38	776	79	22
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1073	137	40	817	83	21
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1452	185	68	1088	302	286
Arrive On Green	0.48	0.48	0.04	0.60	0.19	0.19
Sat Flow, veh/h	3131	388	1619	1800	1619	1530
Grp Volume(v), veh/h	603	607	40	817	83	21
Grp Sat Flow(s),veh/h/ln	1710	1718	1619	1800	1619	1530
Q Serve(g_s), s	15.4	15.4	1.3	17.8	2.4	0.6
Cycle Q Clear(g_c), s	15.4	15.4	1.3	17.8	2.4	0.6
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	817	821	68	1088	302	286
V/C Ratio(X)	0.74	0.74	0.59	0.75	0.27	0.07
Avail Cap(c_a), veh/h	914	918	153	1284	302	286
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.4	11.4	25.5	7.8	18.9	18.1
Incr Delay (d2), s/veh	2.8	2.9	3.0	2.1	2.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	7.9	0.6	9.3	1.2	0.3
LnGrp Delay(d),s/veh	14.2	14.3	28.5	9.9	21.1	18.6
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1210			857	104	
Approach Delay, s/veh	14.3			10.7	20.6	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.9	32.0				38.9		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	3.3	17.4				19.8		4.4
Green Ext Time (p_c), s	0.0	8.4				12.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	956	46	739	77	31
Future Volume (vph)	956	46	739	77	31
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.0	5.7	29.4	10.5	10.5
Actuated g/C Ratio	0.47	0.11	0.57	0.21	0.21
v/c Ratio	0.74	0.27	0.77	0.25	0.10
Control Delay	15.0	28.9	13.4	23.4	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	28.9	13.4	23.4	15.9
LOS	B	C	B	C	B
Approach Delay	15.0		14.3	21.3	
Approach LOS	B		B	C	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 51.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 15.1		Intersection LOS: B	
Intersection Capacity Utilization 58.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	956	122	46	739	77	31
Future Volume (veh/h)	956	122	46	739	77	31
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1028	131	49	795	83	27
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1435	183	79	1092	306	289
Arrive On Green	0.47	0.47	0.05	0.61	0.19	0.19
Sat Flow, veh/h	3133	387	1619	1800	1619	1530
Grp Volume(v), veh/h	577	582	49	795	83	27
Grp Sat Flow(s),veh/h/ln	1710	1721	1619	1800	1619	1530
Q Serve(g_s), s	14.3	14.3	1.6	16.5	2.3	0.8
Cycle Q Clear(g_c), s	14.3	14.3	1.6	16.5	2.3	0.8
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	806	811	79	1092	306	289
V/C Ratio(X)	0.72	0.72	0.62	0.73	0.27	0.09
Avail Cap(c_a), veh/h	927	933	181	1333	306	289
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	24.7	7.3	18.3	17.7
Incr Delay (d2), s/veh	2.3	2.3	3.0	1.6	2.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	7.1	0.8	8.4	1.2	0.4
LnGrp Delay(d),s/veh	13.4	13.4	27.7	8.9	20.5	18.4
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1159			844	110	
Approach Delay, s/veh	13.4			10.0	20.0	
Approach LOS	B			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.2	31.1				38.3		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.6	16.3				18.5		4.3
Green Ext Time (p_c), s	0.0	8.7				12.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	47.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	274	668	46	14	412	89	25	6	9	74	17	349
Future Vol, veh/h	274	668	46	14	412	89	25	6	9	74	17	349
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	291	711	49	15	438	95	27	6	10	79	18	371

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	533	0	0	764	0	0	2032	1885	384	1456	1862	486
Stage 1	-	-	-	-	-	-	1322	1322	-	515	515	-
Stage 2	-	-	-	-	-	-	710	563	-	941	1347	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1045	-	-	858	-	-	38	71	620	100	74	585
Stage 1	-	-	-	-	-	-	168	228	-	546	538	-
Stage 2	-	-	-	-	-	-	428	512	-	287	222	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1045	-	-	858	-	-	~ 10	50	618	~ 73	52	585
Mov Cap-2 Maneuver	-	-	-	-	-	-	378	107	-	140	119	-
Stage 1	-	-	-	-	-	-	121	164	-	394	529	-
Stage 2	-	-	-	-	-	-	148	503	-	196	160	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.7	0.3	19.4	205.5
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	292	1045	-	-	858	-	-	347
HCM Lane V/C Ratio	0.146	0.279	-	-	0.017	-	-	1.349
HCM Control Delay (s)	19.4	9.8	-	-	9.3	-	-	205.5
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.5	1.1	-	-	0.1	-	-	22.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	683	38	18	421	2	23	0	12	11	0	71
Future Vol, veh/h	30	683	38	18	421	2	23	0	12	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	776	43	20	478	2	26	0	14	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	481	0	0	819	0	0	1422	1384	410	973	1405	479
Stage 1	-	-	-	-	-	-	863	863	-	520	520	-
Stage 2	-	-	-	-	-	-	559	521	-	453	885	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1092	-	-	818	-	-	106	145	596	221	141	591
Stage 1	-	-	-	-	-	-	320	374	-	543	535	-
Stage 2	-	-	-	-	-	-	517	535	-	561	366	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1092	-	-	818	-	-	88	137	596	207	133	591
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	301	-	207	133	-
Stage 1	-	-	-	-	-	-	310	363	-	527	522	-
Stage 2	-	-	-	-	-	-	438	522	-	532	355	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	18.4	14.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	309	1092	-	-	818	-	-	473
HCM Lane V/C Ratio	0.129	0.03	-	-	0.025	-	-	0.188
HCM Control Delay (s)	18.4	8.4	-	-	9.5	-	-	14.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	0.7

Intersection	
Intersection Delay, s/veh	23.9
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	339	0	366	0	0	0	0	0	192	154	0
Future Vol, veh/h	0	339	0	366	0	0	0	0	0	192	154	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	365	0	394	0	0	0	0	0	206	166	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	28.6	16.7
HCM LOS	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	192	154	339	366	322	201
LT Vol	192	0	339	0	0	0
Through Vol	0	154	0	0	322	0
RT Vol	0	0	0	366	0	201
Lane Flow Rate	206	166	365	394	346	216
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.475	0.357	0.786	0.715	0.722	0.408
Departure Headway (Hd)	8.28	7.764	7.764	6.54	7.508	6.788
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	436	464	470	555	481	532
Service Time	6.02	5.504	5.464	4.24	5.243	4.523
HCM Lane V/C Ratio	0.472	0.358	0.777	0.71	0.719	0.406
HCM Control Delay	18.3	14.8	33.5	24	27.5	14.1
HCM Lane LOS	C	B	D	C	D	B
HCM 95th-tile Q	2.5	1.6	7	5.8	5.8	2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	322	201
Future Vol, veh/h	0	0	322	201
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	346	216
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	22.4
HCM LOS	C

APPENDIX 6.3:

OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

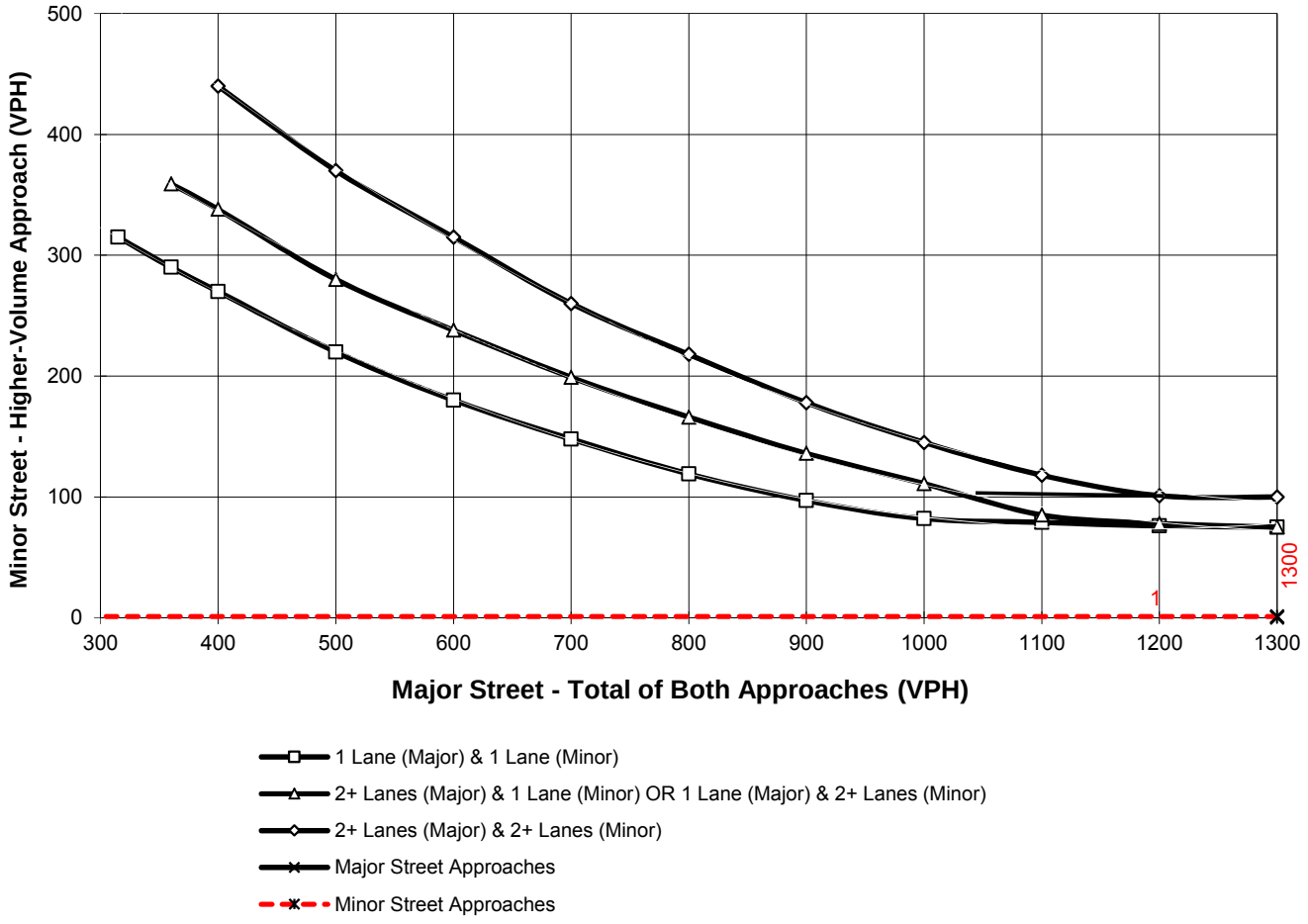
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **2018 Without Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.**
Total of Both Approaches (VPH) = **2309**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Fire Station Dwy.**
High Volume Approach (VPH) = **1**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

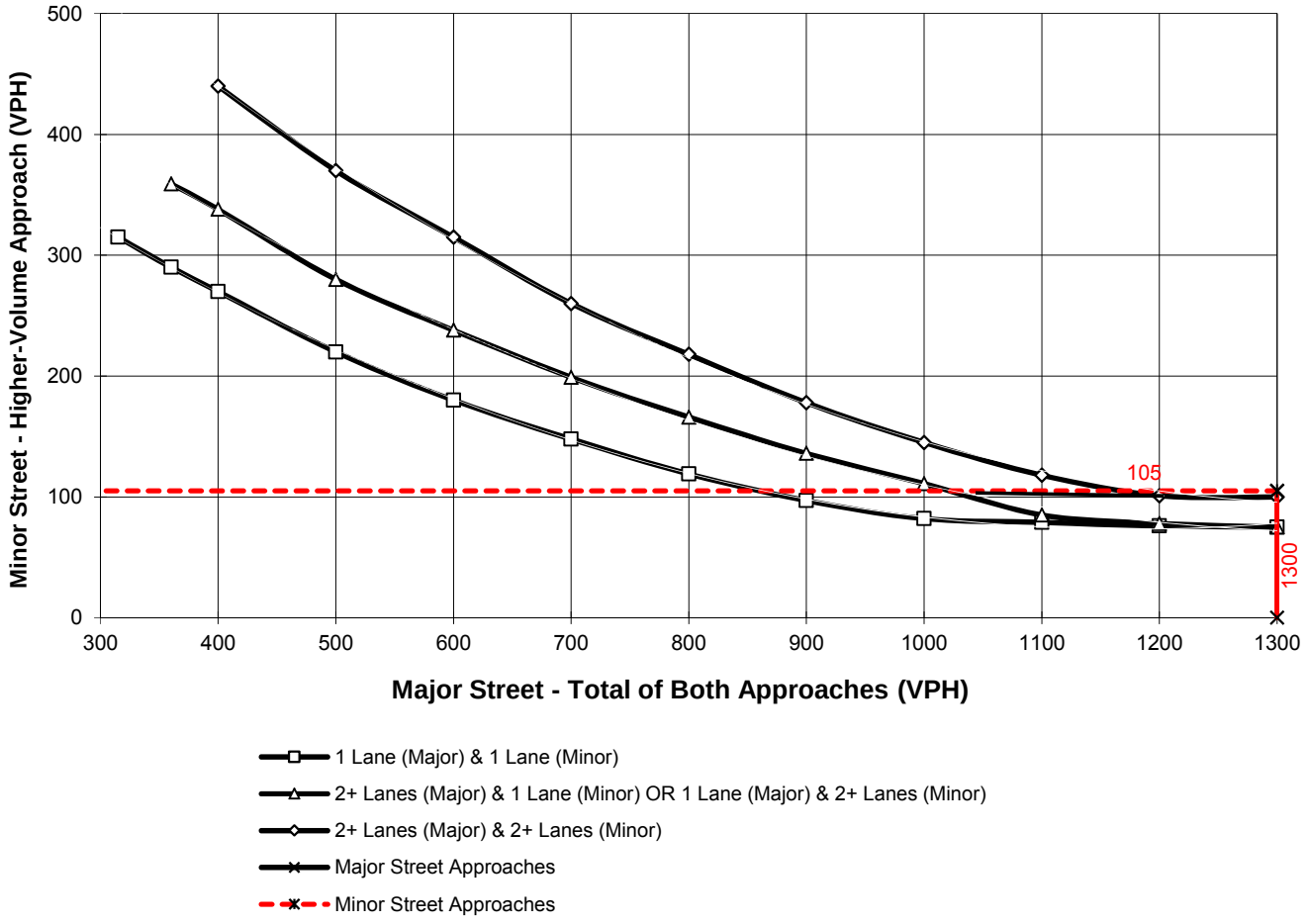
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **2018 Without Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1806**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Rincon Meadows Av.** High Volume Approach (VPH) = **105**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

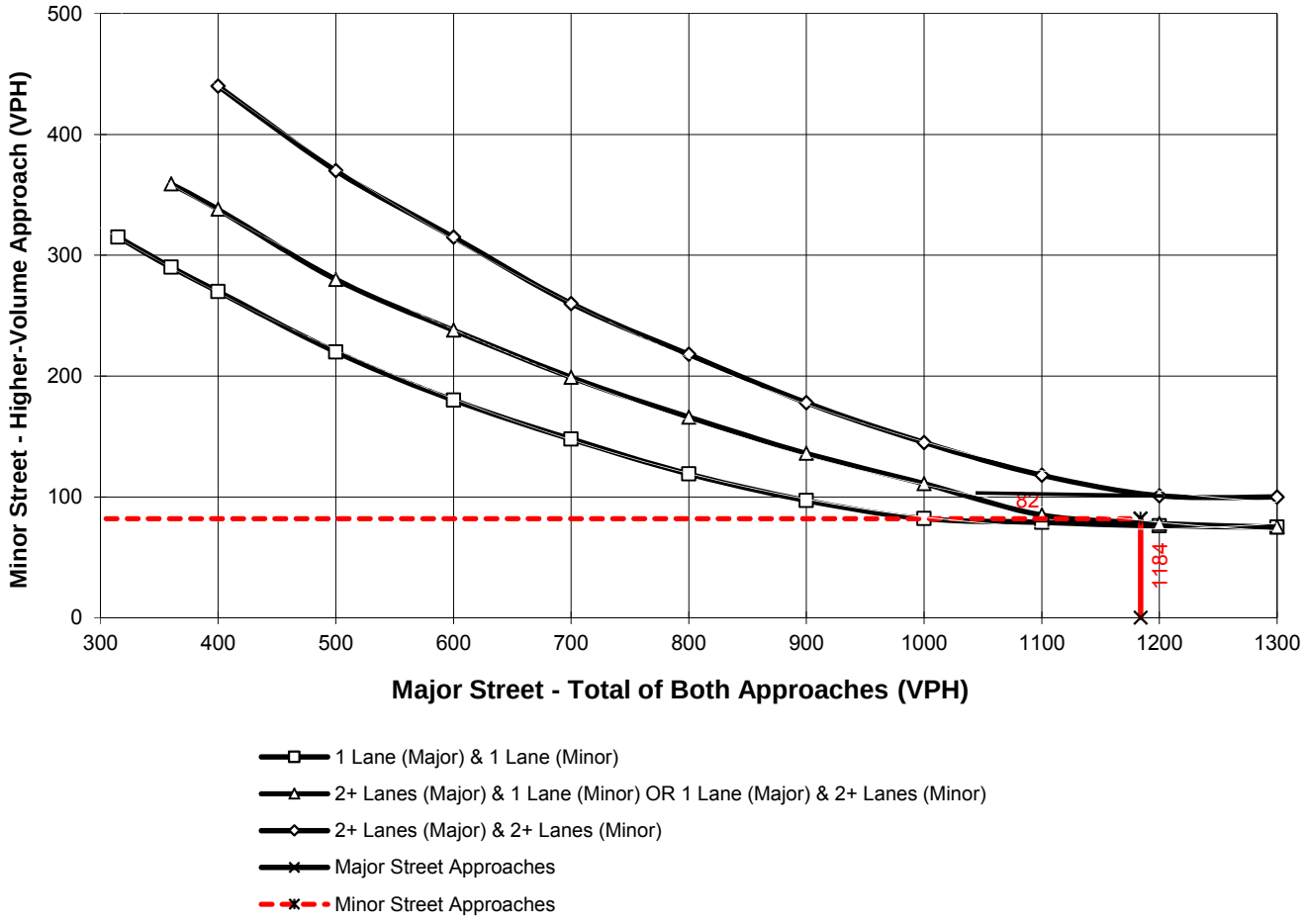
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **2018 Without Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1184**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Meadow Valley Av.** High Volume Approach (VPH) = **82**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 6.4:

OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2018 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 6**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,903** vpd Minor Street Future ADT = **95** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,903**	*1* **95**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,903**	*1* **95**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 8%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2018 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 8**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,652** vpd Minor Street Future ADT = **345** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
XX	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **1,652** / *1* **345**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **1,652** / *1* **345**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. **A** 14% **B** 14%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM				
				TRAFFIC CONDITIONS		**2018 WP**	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	09/06/16
Major Street:	**Mayhew Av.**			Critical Approach Speed (Major)		35	mph
Minor Street:	**Driveway 9**			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,271** vpd

Minor Street Future ADT = **261** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,271**	*1* **261**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,271**	*1* **261**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 11% **B** 11%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2018 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 10				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **897** vpd Minor Street Future ADT = **265** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **897**	*1* **265**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **897**	*1* **265**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 11% **B** 7%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2018 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 11				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **625** vpd Minor Street Future ADT = **123** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **625**	*1* **123**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **625**	*1* **123**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 5% **B** 5%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2018 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Bickmore Av.				Critical Approach Speed (Major)		40 mph
Minor Street:	Mayhew Av.				Critical Approach Speed (Minor)		35 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **7,828** vpd Minor Street Future ADT = **268** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **7,828**	1 **268**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **7,828**	1 **268**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A: 11% B: 22%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

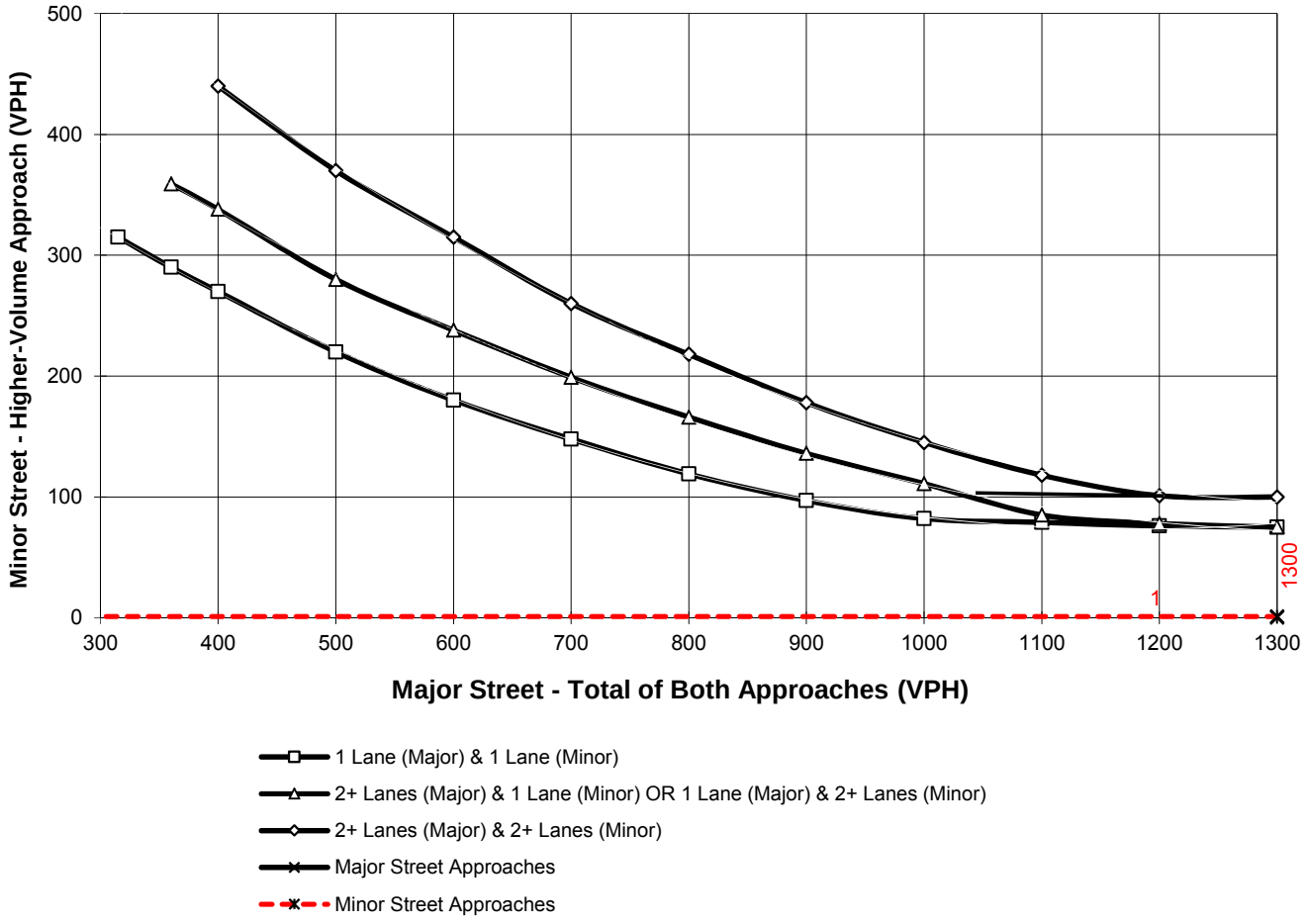
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **2018 With Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.**
Total of Both Approaches (VPH) = **2332**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Fire Station Dwy.**
High Volume Approach (VPH) = **1**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 6.5:

OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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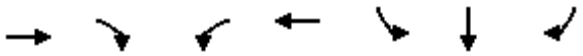


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1257	327	6	993	306	309	411
v/c Ratio	0.43	0.37	0.04	0.57	0.60	0.56	0.70
Control Delay	11.6	3.2	27.5	9.5	22.6	21.2	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	3.2	27.5	9.5	22.6	21.2	20.0
Queue Length 50th (ft)	75	0	3	104	94	94	88
Queue Length 95th (ft)	138	46	m4	m121	171	168	#190
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	889	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.37	0.04	0.57	0.60	0.56	0.70

Intersection Summary

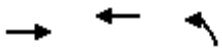
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	588	1233	625	356	202	414
v/c Ratio	1.09	0.55	0.47	0.53	1.03	0.97
Control Delay	93.4	6.4	15.0	11.3	104.5	65.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	6.4	15.0	11.3	104.5	65.7
Queue Length 50th (ft)	~134	81	85	52	~85	82
Queue Length 95th (ft)	#221	162	125	119	#210	#169
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2251	1339	677	196	428
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.55	0.47	0.53	1.03	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

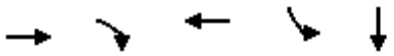
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2374	1057	577
v/c Ratio	0.87dr	0.33	1.19dr
Control Delay	8.4	8.1	38.2
Queue Delay	0.0	0.0	0.0
Total Delay	8.4	8.1	38.2
Queue Length 50th (ft)	171	89	152
Queue Length 95th (ft)	214	123	172
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3078	3174	1165
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.77	0.33	0.50

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1752	91	1237	623	571
v/c Ratio	0.77	0.12	0.55	0.91	0.82
Control Delay	23.5	3.9	12.8	42.4	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	3.9	12.8	42.4	30.7
Queue Length 50th (ft)	310	0	96	316	249
Queue Length 95th (ft)	304	19	97	385	312
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2286	741	2263	731	737
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.77	0.12	0.55	0.85	0.77

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	417	413	365	487	1035	1112	516
v/c Ratio	1.06	1.04	0.80	1.33	0.48	0.93	0.61
Control Delay	97.9	89.0	35.5	179.9	21.8	42.9	5.6
Queue Delay	0.0	0.0	0.0	0.0	2.4	0.7	0.0
Total Delay	97.9	89.0	35.5	179.9	24.2	43.6	5.6
Queue Length 50th (ft)	~277	~278	140	~365	307	315	0
Queue Length 95th (ft)	#465	#478	#293	m#421	m325	#449	70
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	459	367	2147	1197	843
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	12	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	1.04	0.80	1.33	0.86	0.94	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	323	684	1148	679	318	1561
v/c Ratio	0.79	1.53	0.95	0.71	0.90	0.74
Control Delay	46.5	273.4	46.7	7.0	49.1	5.9
Queue Delay	4.1	0.8	0.0	0.0	0.0	2.7
Total Delay	50.6	274.2	46.7	7.0	49.1	8.5
Queue Length 50th (ft)	180	~547	337	5	142	86
Queue Length 95th (ft)	#320	#773	#485	99	m154	m88
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	448	1206	954	376	2109
Starvation Cap Reductn	0	0	0	0	0	414
Spillback Cap Reductn	40	39	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.67	0.95	0.71	0.85	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	560	313	615	1261	75	953
v/c Ratio	0.57	0.47	1.04	0.56	0.08	1.09
Control Delay	60.5	25.9	71.8	1.0	33.1	72.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.5	25.9	71.8	1.0	33.1	72.6
Queue Length 50th (ft)	235	111	~530	7	22	~448
Queue Length 95th (ft)	m246	m114	m#541	m7	42	#702
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	983	662	591	2265	898	875
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.47	1.04	0.56	0.08	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

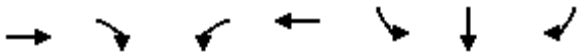
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	900	435	266	68	330	161	160	40
v/c Ratio	1.11	0.86	0.13	0.92	0.82	0.67	0.62	0.11
Control Delay	108.6	59.0	3.6	141.2	22.9	60.6	57.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.6	59.0	3.6	141.2	22.9	60.6	57.0	0.6
Queue Length 50th (ft)	~420	310	11	54	0	126	124	0
Queue Length 95th (ft)	#552	#608	17	#147	#143	184	181	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	811	504	2022	74	403	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.86	0.13	0.92	0.82	0.44	0.40	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1220	724	19	1006	339	348	729
v/c Ratio	0.41	0.74	0.14	0.58	0.66	0.62	1.24
Control Delay	11.5	11.2	37.4	9.4	24.8	22.6	142.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	11.2	37.4	9.4	24.8	22.6	142.6
Queue Length 50th (ft)	72	43	8	79	108	109	~310
Queue Length 95th (ft)	134	#285	m13	100	#197	190	#500
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	977	134	1738	511	562	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.74	0.14	0.58	0.66	0.62	1.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

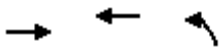
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	441	1254	669	623	189	308
v/c Ratio	0.82	0.59	0.54	0.90	0.77	0.58
Control Delay	38.0	9.4	17.4	30.7	47.9	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	9.4	17.4	30.7	47.9	27.9
Queue Length 50th (ft)	76	61	98	132	72	57
Queue Length 95th (ft)	#151	291	145	#331	#175	93
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1230	694	245	530
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.59	0.54	0.90	0.77	0.58

Intersection Summary

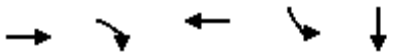
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1756	940	525
v/c Ratio	0.51	0.27	1.05dr
Control Delay	5.3	6.7	52.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.3	6.7	52.2
Queue Length 50th (ft)	124	83	184
Queue Length 95th (ft)	194	125	231
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3425	3514	1003
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.51	0.27	0.52

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	723	89	1062	865	885
v/c Ratio	0.55	0.19	0.81	0.85	0.89
Control Delay	40.2	8.2	42.4	24.6	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	8.2	42.4	24.6	28.9
Queue Length 50th (ft)	180	0	266	471	509
Queue Length 95th (ft)	224	41	323	718	#898
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1305	462	1314	1041	1008
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.55	0.19	0.81	0.83	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	384	376	344	552	1108	977	566
v/c Ratio	0.91	0.88	0.75	1.55	0.53	0.84	0.65
Control Delay	59.6	52.5	33.3	278.1	22.8	35.7	6.1
Queue Delay	0.0	0.0	0.0	0.0	2.6	0.0	0.0
Total Delay	59.6	52.5	33.3	278.1	25.4	35.7	6.1
Queue Length 50th (ft)	216	209	137	~468	341	267	0
Queue Length 95th (ft)	#386	#380	#252	m#486	m332	#354	77
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	450	477	355	2084	1159	871
Starvation Cap Reductn	0	0	0	0	823	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.84	0.72	1.55	0.88	0.84	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	353	597	1218	761	313	1277
v/c Ratio	0.83	1.32	1.04	0.80	0.89	0.62
Control Delay	48.8	186.5	67.3	11.8	52.2	5.1
Queue Delay	19.1	1.5	0.0	0.0	0.0	0.9
Total Delay	68.0	188.0	67.3	11.8	52.2	6.0
Queue Length 50th (ft)	197	~441	~413	35	123	57
Queue Length 95th (ft)	#352	#657	#542	#220	m183	m86
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	452	1175	948	376	2071
Starvation Cap Reductn	0	0	0	0	0	466
Spillback Cap Reductn	71	68	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	1.55	1.04	0.80	0.83	0.80

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	919	197	344	1247	169	1500
v/c Ratio	0.69	0.28	0.83	0.55	0.19	1.72
Control Delay	37.0	10.9	60.9	3.3	34.3	346.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	10.9	60.9	3.3	34.3	346.8
Queue Length 50th (ft)	396	40	225	33	52	~1349
Queue Length 95th (ft)	468	m107	m219	m49	81	#1618
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1338	710	619	2265	898	873
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.28	0.56	0.55	0.19	1.72

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	372	104	242	31	16	451	461	161
v/c Ratio	0.37	0.65	0.16	0.36	0.08	0.84	0.79	0.25
Control Delay	36.9	64.4	11.5	66.2	0.9	49.8	45.2	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	64.4	11.5	66.2	0.9	49.8	45.2	4.4
Queue Length 50th (ft)	126	67	37	24	0	327	327	0
Queue Length 95th (ft)	187	127	58	57	0	437	431	41
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1019	184	1514	91	190	632	682	725
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.57	0.16	0.34	0.08	0.71	0.68	0.22

Intersection Summary

APPENDIX 6.6:

OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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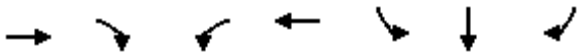


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1259	327	6	994	312	314	411
v/c Ratio	0.43	0.37	0.04	0.57	0.61	0.57	0.70
Control Delay	11.6	3.2	27.5	9.5	22.9	21.4	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	3.2	27.5	9.5	22.9	21.4	20.0
Queue Length 50th (ft)	75	0	3	104	97	96	88
Queue Length 95th (ft)	138	46	m4	m121	175	171	#190
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	889	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.37	0.04	0.57	0.61	0.57	0.70

Intersection Summary

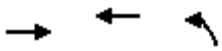
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	588	1246	626	359	202	414
v/c Ratio	1.20	0.55	0.45	0.51	1.03	0.97
Control Delay	134.4	6.4	14.1	10.7	104.5	65.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	134.4	6.4	14.1	10.7	104.5	65.7
Queue Length 50th (ft)	~144	82	82	51	~85	82
Queue Length 95th (ft)	#229	163	122	117	#210	#169
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	491	2251	1396	700	196	428
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.55	0.45	0.51	1.03	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

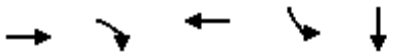
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2397	1058	577
v/c Ratio	0.87dr	0.33	1.20dr
Control Delay	8.7	8.1	38.4
Queue Delay	0.0	0.0	0.0
Total Delay	8.7	8.1	38.4
Queue Length 50th (ft)	175	89	153
Queue Length 95th (ft)	220	123	172
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3076	3174	1164
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.78	0.33	0.50

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1754	91	1238	633	582
v/c Ratio	0.77	0.12	0.55	0.92	0.83
Control Delay	23.8	4.0	13.0	43.3	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	4.0	13.0	43.3	31.2
Queue Length 50th (ft)	311	0	104	324	256
Queue Length 95th (ft)	304	19	97	393	321
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2269	736	2247	731	739
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.77	0.12	0.55	0.87	0.79

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	429	423	365	491	1037	1115	516
v/c Ratio	1.09	1.06	0.80	1.34	0.48	0.93	0.61
Control Delay	107.3	96.0	35.5	184.4	21.8	43.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	2.4	0.9	0.0
Total Delay	107.3	96.0	35.5	184.4	24.2	44.1	5.6
Queue Length 50th (ft)	~292	~291	140	~369	308	317	0
Queue Length 95th (ft)	#483	#492	#293	m#424	m324	#451	70
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	459	367	2147	1197	843
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	15	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	1.06	0.80	1.34	0.86	0.94	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	323	701	1153	684	318	1585
v/c Ratio	0.79	1.56	0.96	0.72	0.90	0.75
Control Delay	46.5	289.7	47.4	7.2	48.2	6.0
Queue Delay	4.5	0.9	0.0	0.0	0.0	3.2
Total Delay	51.0	290.6	47.4	7.2	48.2	9.2
Queue Length 50th (ft)	180	~569	340	6	143	89
Queue Length 95th (ft)	#320	#796	#487	105	m151	m90
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	448	1206	954	376	2109
Starvation Cap Reductn	0	0	0	0	0	412
Spillback Cap Reductn	42	40	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.72	0.96	0.72	0.85	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	563	313	615	1269	75	981
v/c Ratio	0.56	0.47	1.07	0.56	0.08	1.13
Control Delay	59.5	25.6	79.4	1.0	33.1	89.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	25.6	79.4	1.0	33.1	89.5
Queue Length 50th (ft)	236	111	~538	7	22	~507
Queue Length 95th (ft)	m247	m113	m#538	m7	42	#763
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1011	673	577	2265	898	867
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.47	1.07	0.56	0.08	1.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

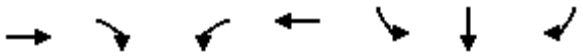
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	903	435	267	68	330	161	160	40
v/c Ratio	1.11	0.86	0.13	0.92	0.82	0.67	0.62	0.11
Control Delay	109.9	58.8	3.6	141.2	22.9	60.6	57.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.9	58.8	3.6	141.2	22.9	60.6	57.0	0.6
Queue Length 50th (ft)	~422	309	11	54	0	126	124	0
Queue Length 95th (ft)	#555	#605	17	#147	#143	184	181	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	811	504	2022	74	403	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.86	0.13	0.92	0.82	0.44	0.40	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1221	724	19	1008	337	354	729
v/c Ratio	0.42	0.74	0.14	0.58	0.66	0.63	1.24
Control Delay	11.5	11.2	37.7	9.4	24.6	22.9	142.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	11.2	37.7	9.4	24.6	22.9	142.6
Queue Length 50th (ft)	72	43	8	79	107	111	~310
Queue Length 95th (ft)	134	#285	m13	100	#193	194	#500
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	977	134	1738	511	561	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.74	0.14	0.58	0.66	0.63	1.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

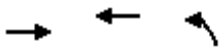
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	441	1258	671	634	189	308
v/c Ratio	0.82	0.59	0.55	0.91	0.77	0.58
Control Delay	38.0	9.4	17.4	33.0	47.9	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	9.4	17.4	33.0	47.9	27.9
Queue Length 50th (ft)	76	61	98	138	72	57
Queue Length 95th (ft)	#151	292	145	#341	#175	93
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1230	694	245	530
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.59	0.55	0.91	0.77	0.58

Intersection Summary

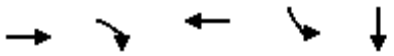
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1762	942	525
v/c Ratio	0.51	0.27	1.05dr
Control Delay	5.3	6.7	52.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.3	6.7	52.2
Queue Length 50th (ft)	124	83	184
Queue Length 95th (ft)	195	125	231
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3425	3514	1003
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.51	0.27	0.52

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	724	89	1064	870	886
v/c Ratio	0.56	0.19	0.81	0.85	0.89
Control Delay	40.3	8.2	42.6	24.9	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	8.2	42.6	24.9	29.0
Queue Length 50th (ft)	180	0	267	477	511
Queue Length 95th (ft)	224	41	324	728	#902
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1303	462	1312	1041	1008
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.56	0.19	0.81	0.84	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	381	381	349	568	1112	978	566
v/c Ratio	0.91	0.89	0.77	1.59	0.53	0.84	0.65
Control Delay	59.2	54.5	34.6	293.8	22.8	35.8	6.1
Queue Delay	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Total Delay	59.2	54.5	34.6	293.8	25.5	35.8	6.1
Queue Length 50th (ft)	214	214	142	~487	344	267	0
Queue Length 95th (ft)	#383	#387	#274	m#496	m330	#355	77
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	451	476	357	2087	1159	871
Starvation Cap Reductn	0	0	0	0	823	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.84	0.73	1.59	0.88	0.84	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	353	602	1238	782	313	1285
v/c Ratio	0.83	1.33	1.05	0.82	0.89	0.62
Control Delay	48.8	191.1	72.5	13.4	52.3	5.2
Queue Delay	20.5	1.6	0.0	0.0	0.0	0.9
Total Delay	69.3	192.7	72.5	13.4	52.3	6.1
Queue Length 50th (ft)	197	~448	~426	45	123	58
Queue Length 95th (ft)	#352	#665	#555	#314	m182	87
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	452	1175	948	376	2071
Starvation Cap Reductn	0	0	0	0	0	462
Spillback Cap Reductn	73	70	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.58	1.05	0.82	0.83	0.80

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	920	197	344	1278	169	1510
v/c Ratio	0.69	0.28	0.83	0.56	0.19	1.77
Control Delay	36.9	10.5	61.4	3.4	34.3	370.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	10.5	61.4	3.4	34.3	370.2
Queue Length 50th (ft)	397	39	224	33	52	~1398
Queue Length 95th (ft)	468	m102	m216	m56	81	#1667
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1341	715	591	2265	898	853
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.28	0.58	0.56	0.19	1.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	373	104	243	31	16	451	461	161
v/c Ratio	0.37	0.65	0.16	0.36	0.08	0.84	0.79	0.25
Control Delay	37.0	64.9	11.3	66.2	0.9	49.8	45.2	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	64.9	11.3	66.2	0.9	49.8	45.2	4.4
Queue Length 50th (ft)	126	66	37	24	0	327	327	0
Queue Length 95th (ft)	187	127	57	57	0	437	431	41
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1019	184	1514	91	190	632	682	725
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.57	0.16	0.34	0.08	0.71	0.68	0.22

Intersection Summary

APPENDIX 6.7:

OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4008*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1481*	pc/h/ln
S	*69.1*	mph
D = v_p / S	*21.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3106*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1142*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3723*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1376*	pc/h/ln
S	*69.6*	mph
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4326*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2386*	pc/h/ln
S	*53.7*	mph
D = v_p / S	*44.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4404*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1636*	pc/h/ln
S	*67.8*	mph
D = v_p / S	*24.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3374*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1247*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6043*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2321*	pc/h/ln
S	*55.4*	mph
D = v_p / S	*41.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4485*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1755*	pc/h/ln
S	*66.4*	mph
D = v_p / S	*26.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6746*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1861*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6847*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1898*	pc/h/ln
S	*64.3*	mph
D = v_p / S	*29.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6910*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1943*	pc/h/ln
S	*63.6*	mph
D = v_p / S	*30.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6927*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1939*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*30.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3606*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1333*	pc/h/ln
S	*69.8*	mph
D = v_p / S	*19.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2304*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*847*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3657*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1345*	pc/h/ln
S	*69.8*	mph
D = v_p / S	*19.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3570*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1979*	pc/h/ln
S	*63.0*	mph
D = v_p / S	*31.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4380*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1627*	pc/h/ln
S	*67.9*	mph
D = v_p / S	*24.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3346*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1243*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5446*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2062*	pc/h/ln
S	*61.4*	mph
D = v_p / S	*33.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4642*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1783*	pc/h/ln
S	*66.1*	mph
D = v_p / S	*27.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7028*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1948*	pc/h/ln
S	*63.5*	mph
D = v_p / S	*30.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7088*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1955*	pc/h/ln
S	*63.4*	mph
D = v_p / S	*30.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6293*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1744*	pc/h/ln
S	*66.6*	mph
D = v_p / S	*26.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*RV*	Highway/Direction of Travel	*SR-60 Eastbound*
Agency or Company	*Urban Crossroads, Inc.*	From/To	*E of Euclid*
Date Performed	*9/19/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Opening Year (2018) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6373*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1775*	pc/h/ln
S	*66.2*	mph
D = v_p / S	*26.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 6.8:

OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4027*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1488*	pc/h/ln
S	*69.0*	mph
D = v_p / S	*21.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3118*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1147*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3735*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1380*	pc/h/ln
S	*69.6*	mph
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4331*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2389*	pc/h/ln
S	*53.6*	mph
D = v_p / S	*44.6*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4409*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1637*	pc/h/ln
S	*67.8*	mph
D = v_p / S	*24.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3377*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1248*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6046*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2322*	pc/h/ln
S	*55.4*	mph
D = v_p / S	*41.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4504*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1762*	pc/h/ln
S	*66.3*	mph
D = v_p / S	*26.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6748*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1861*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6857*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1901*	pc/h/ln
S	*64.3*	mph
D = v_p / S	*29.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6918*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1946*	pc/h/ln
S	*63.5*	mph
D = v_p / S	*30.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6930*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1940*	pc/h/ln
S	*63.6*	mph
D = v_p / S	*30.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3612*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1335*	pc/h/ln
S	*69.8*	mph
D = v_p / S	*19.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2308*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*849*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3661*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1346*	pc/h/ln
S	*69.8*	mph
D = v_p / S	*19.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3589*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1990*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*31.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4399*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1634*	pc/h/ln
S	*67.8*	mph
D = v_p / S	*24.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3358*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1247*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5458*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2067*	pc/h/ln
S	*61.3*	mph
D = v_p / S	*33.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4648*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1785*	pc/h/ln
S	*66.0*	mph
D = v_p / S	*27.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7036*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1950*	pc/h/ln
S	*63.5*	mph
D = v_p / S	*30.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7091*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1956*	pc/h/ln
S	*63.4*	mph
D = v_p / S	*30.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6296*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1745*	pc/h/ln
S	*66.6*	mph
D = v_p / S	*26.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6383*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1778*	pc/h/ln
S	*66.1*	mph
D = v_p / S	*26.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 6.9:

OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 4008	
	Ramp Volume, V_R: 902	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4008	0.92	Level	4	0	0.980	1.00	4444
Ramp	902	0.92	Level	10	0	0.952	1.00	1029
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.602 using Equation (Exhibit 13-7)

V_{12} = 3083 pc/h

V_3 or V_{av34} 1361 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4444	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3415	Exhibit 13-8	7200	No
V_R	1029	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3083	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.391 (Exhibit 13-12)

S_R = 59.1 mph (Exhibit 13-12)

S_0 = 75.4 mph (Exhibit 13-12)

S = 63.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 176 veh/h
	Freeway Volume, V_F: 3723	
	Ramp Volume, V_R: 817	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3723	0.92	Level	4	0	0.980	1.00	4128
Ramp	817	0.92	Level	12	0	0.943	1.00	941
UpStream								
DownStream	176	0.92	Level	19	0	0.913	1.00	209

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.614 using Equation (Exhibit 13-7)

V_{12} = 2896 pc/h

V_3 or V_{av34} 1232 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4128	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3187	Exhibit 13-8	7200	No
V_R	941	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2896	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.383 (Exhibit 13-12)

S_R = 59.3 mph (Exhibit 13-12)

S_0 = 75.9 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 280 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3257	
	Ramp Volume, V_R: 537	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3257	0.92	Level	2	0	0.990	1.00	3576
Ramp	537	0.92	Level	15	0	0.930	1.00	627
UpStream	280	0.92	Level	11	0	0.948	1.00	321
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3576 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4203	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4203	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 35.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.558 (Exibit 13-11)

S_R= 54.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 54.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 532 veh/h
	Freeway Volume, V_F: 3257	
	Ramp Volume, V_R: 537	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3257	0.92	Level	2	0	0.990	1.00	3576
Ramp	537	0.92	Level	15	0	0.930	1.00	627
UpStream								
DownStream	532	0.92	Level	1	0	0.995	1.00	581

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3576 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4203	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4203	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 35.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.558 (Exibit 13-11)

S_R = 54.4 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 54.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3374	
	Ramp Volume, V_R: 1031	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3374	0.92	Level	4	0	0.980	1.00	3741
Ramp	1031	0.92	Level	6	0	0.971	1.00	1154
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2208 pc/h

V_3 or V_{av34} = 1533 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2208 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4895	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3362	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 28.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.393 (Exibit 13-11)

S_R = 59.0 mph (Exhibit 13-11)

S_0 = 66.3 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	780 veh/h	Freeway Volume, V_F	5215	V_D =	veh/h
		Ramp Volume, V_R	828		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5215	0.92	Level	12	0	0.943	1.00	6009
Ramp	828	0.92	Level	9	0	0.957	1.00	940
UpStream	780	0.92	Level	2	0	0.990	1.00	856
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3554 pc/h

V_3 or V_{av34} = 2455 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3554 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6949	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4494	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 37.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.625 (Exibit 13-11)

S_R = 52.5 mph (Exhibit 13-11)

S_0 = 62.5 mph (Exhibit 13-11)

S = 55.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 845 veh/h
	Freeway Volume, V_F: 4485	
	Ramp Volume, V_R: 846	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4485	0.92	Level	16	0	0.926	1.00	5265
Ramp	846	0.92	Level	12	0	0.943	1.00	975
UpStream								
DownStream	845	0.92	Level	4	0	0.980	1.00	937

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.584 using Equation (Exhibit 13-7)

V_{12} = 3478 pc/h

V_3 or V_{av34} 1787 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5265	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4290	Exhibit 13-8	7200	No
V_R	975	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3478	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.386 (Exhibit 13-12)

S_R= 59.2 mph (Exhibit 13-12)

S_0= 73.7 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 859 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	5988
Ramp Volume, V_R	758
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5988	0.92	Level	1	0	0.995	1.00	6541
Ramp	758	0.92	Level	19	0	0.913	1.00	902
UpStream	859	0.92	Level	21	0	0.905	1.00	1032
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.105 using Equation (Exhibit 13-6)
V_{12} = 687 pc/h
V_3 or V_{av34} = 2927 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2616 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7443	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3518	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.8 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.385 (Exibit 13-11)
S_R = 59.2 mph (Exhibit 13-11)
S_0 = 64.7 mph (Exhibit 13-11)
S = 62.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 758 veh/h
	Freeway Volume, V_F: 6847	
	Ramp Volume, V_R: 859	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6847	0.92	Level	4	0	0.980	1.00	7591
Ramp	859	0.92	Level	21	0	0.905	1.00	1032
UpStream								
DownStream	758	0.92	Level	19	0	0.913	1.00	902

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3892 pc/h

V_3 or V_{av34} 1849 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7591	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6559	Exhibit 13-8	9600	No
V_R	1032	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3892	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.391 (Exhibit 13-12)

S_R = 59.1 mph (Exhibit 13-12)

S_0 = 73.5 mph (Exhibit 13-12)

S = 65.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 732 veh/h
	Freeway Volume, V_F: 6910	
	Ramp Volume, V_R: 715	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6910	0.92	Level	7	0	0.966	1.00	7774
Ramp	715	0.92	Level	27	0	0.881	1.00	882
UpStream								
DownStream	732	0.92	Level	19	0	0.913	1.00	871

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3887 pc/h

V_3 or V_{av34} 1943 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7774	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6892	Exhibit 13-8	9600	No
V_R	882	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3887	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.377 (Exhibit 13-12)

S_R = 59.4 mph (Exhibit 13-12)

S_0 = 73.1 mph (Exhibit 13-12)

S = 65.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 715 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	6195
Ramp Volume, V_R	732
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6195	0.92	Level	5	0	0.976	1.00	6902
Ramp	732	0.92	Level	19	0	0.913	1.00	871
UpStream	715	0.92	Level	27	0	0.881	1.00	882
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.109 using Equation (Exhibit 13-6)
V_{12} = 752 pc/h
V_3 or V_{av34} = 3075 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2760 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7773	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3631	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.3 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.423 (Exibit 13-11)
S_R = 58.1 mph (Exhibit 13-11)
S_0 = 64.3 mph (Exhibit 13-11)
S = 61.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 3606	
	Ramp Volume, V_R: 1301	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3606	0.92	Level	4	0	0.980	1.00	3998
Ramp	1301	0.92	Level	4	0	0.980	1.00	1442
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.594 using Equation (Exhibit 13-7)

V_{12} = 2960 pc/h

V_3 or V_{av34} 1038 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3998	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2556	Exhibit 13-8	7200	No
V_R	1442	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2960	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.428 (Exhibit 13-12)

S_R = 58.0 mph (Exhibit 13-12)

S_0 = 76.6 mph (Exhibit 13-12)

S = 61.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 338 veh/h
	Freeway Volume, V_F: 3657	
	Ramp Volume, V_R: 1632	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3657	0.92	Level	3	0	0.985	1.00	4035
Ramp	1632	0.92	Level	5	0	0.976	1.00	1818
UpStream								
DownStream	338	0.92	Level	3	0	0.985	1.00	373

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.575 using Equation (Exhibit 13-7)

V_{12} = 3094 pc/h

V_3 or V_{av34} 941 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4035	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2217	Exhibit 13-8	7200	No
V_R	1818	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3094	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.462 (Exhibit 13-12)

S_R= 57.1 mph (Exhibit 13-12)

S_0= 76.8 mph (Exhibit 13-12)

S = 60.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 1007 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2702	
	Ramp Volume, V_R: 800	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2702	0.92	Level	1	0	0.995	1.00	2952
Ramp	800	0.92	Level	12	0	0.943	1.00	922
UpStream	1007	0.92	Level	4	0	0.980	1.00	1116
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2952 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3874	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3874	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.485 (Exibit 13-11)

S_R = 56.4 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 68 veh/h
	Freeway Volume, V_F: 2702	
	Ramp Volume, V_R: 800	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2702	0.92	Level	1	0	0.995	1.00	2952
Ramp	800	0.92	Level	12	0	0.943	1.00	922
UpStream								
DownStream	68	0.92	Level	8	0	0.962	1.00	77

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2952 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3874	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3874	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.485 (Exibit 13-11)

S_R = 56.4 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3346	
	Ramp Volume, V_R: 1034	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3346	0.92	Level	5	0	0.976	1.00	3728
Ramp	1034	0.92	Level	4	0	0.980	1.00	1146
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2200 pc/h

V_3 or V_{av34} = 1528 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2200 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4874	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3346	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 28.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.391 (Exibit 13-11)

S_R = 59.0 mph (Exhibit 13-11)

S_0 = 66.3 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	378 veh/h	Freeway Volume, V_F	4825	V_D =	veh/h
		Ramp Volume, V_R	621		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4825	0.92	Level	8	0	0.962	1.00	5454
Ramp	621	0.92	Level	14	0	0.935	1.00	722
UpStream	378	0.92	Level	2	0	0.990	1.00	415
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3226 pc/h

V_3 or V_{av34} = 2228 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3226 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6176	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3948	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.478 (Exibit 13-11)

S_R = 56.6 mph (Exhibit 13-11)

S_0 = 63.8 mph (Exhibit 13-11)

S = 59.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	0
Freeway Volume, V_F	4642
Ramp Volume, V_R	1372
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 1500 ft; V_D = 478 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4642	0.92	Level	12	0	0.943	1.00	5348
Ramp	1372	0.92	Level	9	0	0.957	1.00	1558
UpStream								
DownStream	478	0.92	Level	2	0	0.990	1.00	525

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.555 using Equation (Exhibit 13-7)

V_{12} = 3660 pc/h

V_3 or V_{av34} 1688 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5348	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3790	Exhibit 13-8	7200	No
V_R	1558	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3660	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.438 (Exhibit 13-12)

S_R= 57.7 mph (Exhibit 13-12)

S_0= 74.1 mph (Exhibit 13-12)

S = 62.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2200 ft
- V_u = 922 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	6165
Ramp Volume, V_R	863
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6165	0.92	Level	2	0	0.990	1.00	6768
Ramp	863	0.92	Level	19	0	0.913	1.00	1027
UpStream	922	0.92	Level	11	0	0.948	1.00	1057
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = (Equation 13-6 or 13-7)
- P_{FM} = 0.089 using Equation (Exhibit 13-6)
- V_{12} = 605 pc/h
- V_3 or V_{av34} = 3081 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 2707 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7795	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3734	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

- D_R = 29.4 (pc/mi/ln)
- LOS = D (Exhibit 13-2)

Speed Determination

- M_S = 0.417 (Exibit 13-11)
- S_R = 58.3 mph (Exhibit 13-11)
- S_0 = 64.5 mph (Exhibit 13-11)
- S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 863 veh/h
	Freeway Volume, V_F: 7088	
	Ramp Volume, V_R: 922	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7088	0.92	Level	3	0	0.985	1.00	7820
Ramp	922	0.92	Level	11	0	0.948	1.00	1057
UpStream								
DownStream	863	0.92	Level	19	0	0.913	1.00	1027

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4006 pc/h

V_3 or V_{av34} 1907 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7820	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6763	Exhibit 13-8	9600	No
V_R	1057	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4006	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.393 (Exhibit 13-12)

S_R= 59.0 mph (Exhibit 13-12)

S_0= 73.3 mph (Exhibit 13-12)

S = 65.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 853 veh/h
	Freeway Volume, V_F: 6293	
	Ramp Volume, V_R: 773	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6293	0.92	Level	4	0	0.980	1.00	6977
Ramp	773	0.92	Level	16	0	0.926	1.00	907
UpStream								
DownStream	853	0.92	Level	17	0	0.922	1.00	1006

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3554 pc/h

V_3 or V_{av34} 1711 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6977	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6070	Exhibit 13-8	9600	No
V_R	907	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3554	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 32.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.380 (Exhibit 13-12)

S_R= 59.4 mph (Exhibit 13-12)

S_0= 74.0 mph (Exhibit 13-12)

S = 65.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 773 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5520
Ramp Volume, V_R	853
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5520	0.92	Level	3	0	0.985	1.00	6090
Ramp	853	0.92	Level	17	0	0.922	1.00	1006
UpStream	773	0.92	Level	16	0	0.926	1.00	907
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.092 using Equation (Exhibit 13-6)
V_{12} = 561 pc/h
V_3 or V_{av34} = 2764 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2436 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7096	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3442	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.7 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.398 (Exibit 13-11)
S_R = 58.9 mph (Exhibit 13-11)
S_0 = 65.2 mph (Exhibit 13-11)
S = 62.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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APPENDIX 6.10:

OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 4027	
	Ramp Volume, V_R: 909	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4027	0.92	Level	4	0	0.980	1.00	4465
Ramp	909	0.92	Level	10	0	0.952	1.00	1037
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.601 using Equation (Exhibit 13-7)

V_{12} = 3096 pc/h

V_3 or V_{av34} 1369 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4465	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3428	Exhibit 13-8	7200	No
V_R	1037	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3096	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.391 (Exhibit 13-12)

S_R = 59.0 mph (Exhibit 13-12)

S_0 = 75.4 mph (Exhibit 13-12)

S = 63.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 176 veh/h
	Freeway Volume, V_F: 3735	
	Ramp Volume, V_R: 829	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3735	0.92	Level	4	0	0.980	1.00	4141
Ramp	829	0.92	Level	12	0	0.943	1.00	955
UpStream								
DownStream	176	0.92	Level	19	0	0.913	1.00	209

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.613 using Equation (Exhibit 13-7)

V_{12} = 2907 pc/h

V_3 or V_{av34} 1234 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4141	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3186	Exhibit 13-8	7200	No
V_R	955	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2907	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)

S_R= 59.2 mph (Exhibit 13-12)

S_0= 75.9 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 280 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3257	
	Ramp Volume, V_R: 542	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3257	0.92	Level	2	0	0.990	1.00	3576
Ramp	542	0.92	Level	15	0	0.930	1.00	633
UpStream	280	0.92	Level	11	0	0.948	1.00	321
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3576 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4209	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4209	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 35.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.560 (Exibit 13-11)

S_R = 54.3 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 54.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_S = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 532 veh/h
	Freeway Volume, V_F: 3257	
	Ramp Volume, V_R: 542	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3257	0.92	Level	2	0	0.990	1.00	3576
Ramp	542	0.92	Level	15	0	0.930	1.00	633
UpStream								
DownStream	532	0.92	Level	1	0	0.995	1.00	581

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3576 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4209	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4209	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 35.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.560 (Exibit 13-11)

S_R= 54.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 54.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3377	
	Ramp Volume, V_R: 1033	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3377	0.92	Level	4	0	0.980	1.00	3744
Ramp	1033	0.92	Level	6	0	0.971	1.00	1157
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2209 pc/h

V_3 or V_{av34} = 1535 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2209 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4901	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3366	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 28.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.393 (Exibit 13-11)

S_R = 59.0 mph (Exhibit 13-11)

S_0 = 66.3 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	780 veh/h	Freeway Volume, V_F	5215	V_D =	veh/h
		Ramp Volume, V_R	831		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5215	0.92	Level	12	0	0.943	1.00	6009
Ramp	831	0.92	Level	10	0	0.952	1.00	948
UpStream	780	0.92	Level	2	0	0.990	1.00	856
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3554 pc/h

V_3 or V_{av34} = 2455 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3554 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6957	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4502	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 37.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.628 (Exibit 13-11)

S_R = 52.4 mph (Exhibit 13-11)

S_0 = 62.5 mph (Exhibit 13-11)

S = 55.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 845 veh/h
	Freeway Volume, V_F: 4504	
	Ramp Volume, V_R: 865	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4504	0.92	Level	16	0	0.926	1.00	5287
Ramp	865	0.92	Level	13	0	0.939	1.00	1001
UpStream								
DownStream	845	0.92	Level	4	0	0.980	1.00	937

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.582 using Equation (Exhibit 13-7)

V_{12} = 3495 pc/h

V_3 or V_{av34} 1792 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5287	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4286	Exhibit 13-8	7200	No
V_R	1001	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3495	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.388 (Exhibit 13-12)

S_R = 59.1 mph (Exhibit 13-12)

S_0 = 73.7 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 869 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	5988
Ramp Volume, V_R	760
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5988	0.92	Level	1	0	0.995	1.00	6541
Ramp	760	0.92	Level	19	0	0.913	1.00	905
UpStream	869	0.92	Level	22	0	0.901	1.00	1048
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.105 using Equation (Exhibit 13-6)
V_{12} = 685 pc/h
V_3 or V_{av34} = 2928 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2616 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7446	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3521	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 27.8 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.385 (Exibit 13-11)
S_R = 59.2 mph (Exhibit 13-11)
S_0 = 64.7 mph (Exhibit 13-11)
S = 62.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 760 veh/h
	Freeway Volume, V_F: 6857	
	Ramp Volume, V_R: 869	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6857	0.92	Level	4	0	0.980	1.00	7602
Ramp	869	0.92	Level	22	0	0.901	1.00	1048
UpStream								
DownStream	760	0.92	Level	19	0	0.913	1.00	905

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3906 pc/h

V_3 or V_{av34} 1848 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7602	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6554	Exhibit 13-8	9600	No
V_R	1048	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3906	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.392 (Exhibit 13-12)

S_R = 59.0 mph (Exhibit 13-12)

S_0 = 73.5 mph (Exhibit 13-12)

S = 65.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	220
Freeway Volume, V_F	6918
Ramp Volume, V_R	723
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2115 ft; V_D = 735 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6918	0.92	Level	7	0	0.966	1.00	7783
Ramp	723	0.92	Level	27	0	0.881	1.00	892
UpStream								
DownStream	735	0.92	Level	20	0	0.909	1.00	879

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3896 pc/h

V_3 or V_{av34} 1943 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7783	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6891	Exhibit 13-8	9600	No
V_R	892	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3896	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.8 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.378 (Exhibit 13-12)

S_R = 59.4 mph (Exhibit 13-12)

S_0 = 73.1 mph (Exhibit 13-12)

S = 65.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 723 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	6195
Ramp Volume, V_R	735
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6195	0.92	Level	5	0	0.976	1.00	6902
Ramp	735	0.92	Level	20	0	0.909	1.00	879
UpStream	723	0.92	Level	27	0	0.881	1.00	892
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.108 using Equation (Exhibit 13-6)
V_{12} = 745 pc/h
V_3 or V_{av34} = 3078 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2760 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7781	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3639	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.3 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.424 (Exibit 13-11)
S_R = 58.1 mph (Exhibit 13-11)
S_0 = 64.3 mph (Exhibit 13-11)
S = 61.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 3612	
	Ramp Volume, V_R: 1303	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3612	0.92	Level	4	0	0.980	1.00	4005
Ramp	1303	0.92	Level	4	0	0.980	1.00	1445
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.593 using Equation (Exhibit 13-7)

V_{12} = 2964 pc/h

V_3 or V_{av34} 1041 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4005	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2560	Exhibit 13-8	7200	No
V_R	1445	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2964	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.428 (Exhibit 13-12)

S_R = 58.0 mph (Exhibit 13-12)

S_0 = 76.6 mph (Exhibit 13-12)

S = 61.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 338 veh/h
	Freeway Volume, V_F: 3661	
	Ramp Volume, V_R: 1636	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3661	0.92	Level	3	0	0.985	1.00	4039
Ramp	1636	0.92	Level	5	0	0.976	1.00	1823
UpStream								
DownStream	338	0.92	Level	3	0	0.985	1.00	373

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.575 using Equation (Exhibit 13-7)

V_{12} = 3098 pc/h

V_3 or V_{av34} 941 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4039	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2216	Exhibit 13-8	7200	No
V_R	1823	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3098	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.462 (Exhibit 13-12)

S_R= 57.1 mph (Exhibit 13-12)

S_0= 76.8 mph (Exhibit 13-12)

S = 60.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 1007 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2702	
	Ramp Volume, V_R: 819	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2702	0.92	Level	1	0	0.995	1.00	2952
Ramp	819	0.92	Level	12	0	0.943	1.00	944
UpStream	1007	0.92	Level	4	0	0.980	1.00	1116
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2952 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3896	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3896	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.489 (Exibit 13-11)

S_R = 56.3 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 68 veh/h
	Freeway Volume, V_F: 2702	
	Ramp Volume, V_R: 819	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2702	0.92	Level	1	0	0.995	1.00	2952
Ramp	819	0.92	Level	12	0	0.943	1.00	944
UpStream								
DownStream	68	0.92	Level	8	0	0.962	1.00	77

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2952 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3896	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3896	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.489 (Exibit 13-11)

S_R = 56.3 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3358	
	Ramp Volume, V_R: 1041	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3358	0.92	Level	5	0	0.976	1.00	3741
Ramp	1041	0.92	Level	5	0	0.976	1.00	1160
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2208 pc/h

V_3 or V_{av34} = 1533 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2208 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4901	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3368	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 28.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.394 (Exibit 13-11)

S_R = 59.0 mph (Exhibit 13-11)

S_0 = 66.3 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	378 veh/h	Freeway Volume, V_F	4825	V_D =	veh/h
		Ramp Volume, V_R	633		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4825	0.92	Level	8	0	0.962	1.00	5454
Ramp	633	0.92	Level	14	0	0.935	1.00	736
UpStream	378	0.92	Level	2	0	0.990	1.00	415
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3226 pc/h

V_3 or V_{av34} = 2228 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3226 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6190	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3962	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.481 (Exibit 13-11)

S_R = 56.5 mph (Exhibit 13-11)

S_0 = 63.8 mph (Exhibit 13-11)

S = 58.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	0
Freeway Volume, V_F	4648
Ramp Volume, V_R	1378
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 1500 ft; V_D = 478 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4648	0.92	Level	12	0	0.943	1.00	5355
Ramp	1378	0.92	Level	9	0	0.957	1.00	1565
UpStream								
DownStream	478	0.92	Level	2	0	0.990	1.00	525

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.554 using Equation (Exhibit 13-7)

V_{12} = 3665 pc/h

V_3 or V_{av34} 1690 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5355	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3790	Exhibit 13-8	7200	No
V_R	1565	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3665	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.8 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.439 (Exhibit 13-12)

S_R= 57.7 mph (Exhibit 13-12)

S_0= 74.1 mph (Exhibit 13-12)

S = 62.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 925 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	6165
Ramp Volume, V_R	871
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6165	0.92	Level	2	0	0.990	1.00	6768
Ramp	871	0.92	Level	19	0	0.913	1.00	1037
UpStream	925	0.92	Level	11	0	0.948	1.00	1061
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.088 using Equation (Exhibit 13-6)
V_{12} = 597 pc/h
V_3 or V_{av34} = 3085 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2707 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7805	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3744	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.5 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.418 (Exibit 13-11)
S_R = 58.3 mph (Exhibit 13-11)
S_0 = 64.5 mph (Exhibit 13-11)
S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 871 veh/h
	Freeway Volume, V_F: 7091	
	Ramp Volume, V_R: 925	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7091	0.92	Level	3	0	0.985	1.00	7823
Ramp	925	0.92	Level	11	0	0.948	1.00	1061
UpStream								
DownStream	871	0.92	Level	19	0	0.913	1.00	1037

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4009 pc/h

V_3 or V_{av34} 1907 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7823	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6762	Exhibit 13-8	9600	No
V_R	1061	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4009	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.2 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.393 (Exhibit 13-12)

S_R= 59.0 mph (Exhibit 13-12)

S_0= 73.3 mph (Exhibit 13-12)

S = 65.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	220
Freeway Volume, V_F	6296
Ramp Volume, V_R	776
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 2115 ft
V_D = 863 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6296	0.92	Level	4	0	0.980	1.00	6980
Ramp	776	0.92	Level	17	0	0.922	1.00	915
UpStream								
DownStream	863	0.92	Level	18	0	0.917	1.00	1022

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 0.436 using Equation (Exhibit 13-7)
V_{12} = 3559 pc/h
V_3 or V_{av34} 1710 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6980	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6065	Exhibit 13-8	9600	No
V_R	915	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3559	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 32.9 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.380 (Exhibit 13-12)
S_R= 59.4 mph (Exhibit 13-12)
S_0= 74.0 mph (Exhibit 13-12)
S = 65.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2018 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 776 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5520
Ramp Volume, V_R	863
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5520	0.92	Level	3	0	0.985	1.00	6090
Ramp	863	0.92	Level	18	0	0.917	1.00	1022
UpStream	776	0.92	Level	17	0	0.922	1.00	915
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.090 using Equation (Exhibit 13-6)
V_{12} = 548 pc/h
V_3 or V_{av34} = 2771 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2436 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7112	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3458	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.8 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.400 (Exibit 13-11)
S_R = 58.8 mph (Exhibit 13-11)
S_0 = 65.2 mph (Exhibit 13-11)
S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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APPENDIX 6.11:

OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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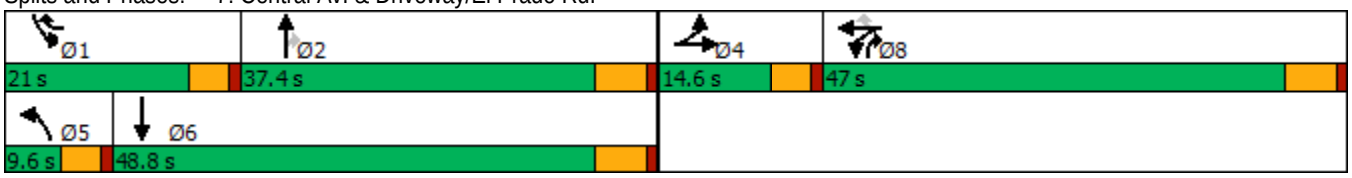
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1029	3	501	2	767	688	393	627
Future Volume (vph)	1	1	1029	3	501	2	767	688	393	627
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	47.0	47.0	21.0	9.6	37.4	47.0	21.0	48.8
Total Split (%)	12.2%	12.2%	39.2%	39.2%	17.5%	8.0%	31.2%	39.2%	17.5%	40.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	41.3	41.3	63.6	5.0	31.7	73.0	16.4	51.0
Actuated g/C Ratio	0.09	0.09	0.38	0.38	0.59	0.05	0.29	0.67	0.15	0.47
v/c Ratio	0.01	0.01	0.98	0.93	0.55	0.03	0.85	0.64	0.92	0.31
Control Delay	48.0	41.0	66.4	55.3	9.4	53.0	46.2	4.8	71.7	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	66.4	55.3	9.4	53.0	46.2	4.8	71.7	19.4
LOS	D	D	E	E	A	D	D	A	E	B
Approach Delay		43.3		44.0			26.7			39.4
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 36.5	Intersection LOS: D
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1029	3	501	2	767	688	393	627	9
Future Volume (veh/h)	1	1	1	1029	3	501	2	767	688	393	627	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1145	0	414	2	852	595	437	697	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1197	0	792	4	978	997	466	2162	25
Arrive On Green	0.01	0.01	0.01	0.37	0.00	0.37	0.00	0.29	0.29	0.15	0.43	0.43
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	3141	5008	57
Grp Volume(v), veh/h	1	0	2	1145	0	414	2	852	595	437	456	249
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1570	1638	1790
Q Serve(g_s), s	0.1	0.0	0.1	38.1	0.0	19.8	0.1	26.2	24.8	15.2	10.2	10.2
Cycle Q Clear(g_c), s	0.1	0.0	0.1	38.1	0.0	19.8	0.1	26.2	24.8	15.2	10.2	10.2
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1197	0	792	4	978	997	466	1414	772
V/C Ratio(X)	0.08	0.00	0.15	0.96	0.00	0.52	0.46	0.87	0.60	0.94	0.32	0.32
Avail Cap(c_a), veh/h	146	0	150	1207	0	797	73	978	997	466	1414	772
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	0.0	54.5	34.0	0.0	17.6	55.0	37.5	10.8	46.6	20.7	20.7
Incr Delay (d2), s/veh	0.9	0.0	2.0	16.5	0.0	0.6	25.4	10.5	2.6	26.5	0.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	19.8	0.0	8.4	0.1	13.7	18.7	8.3	4.7	5.2
LnGrp Delay(d),s/veh	55.4	0.0	56.4	50.5	0.0	18.2	80.4	48.1	13.5	73.0	21.3	21.9
LnGrp LOS	E		E	D		B	F	D	B	E	C	C
Approach Vol, veh/h		3			1559			1449			1142	
Approach Delay, s/veh		56.1			41.9			33.9			41.2	
Approach LOS		E			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.0	37.4		5.5	4.9	53.5		46.7
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	16.4	31.6		10.0	5.0	43.0		41.2
Max Q Clear Time (g_c+I1), s	17.2	28.2		2.1	2.1	12.2		40.1
Green Ext Time (p_c), s	0.0	2.7		0.0	0.0	6.5		0.7

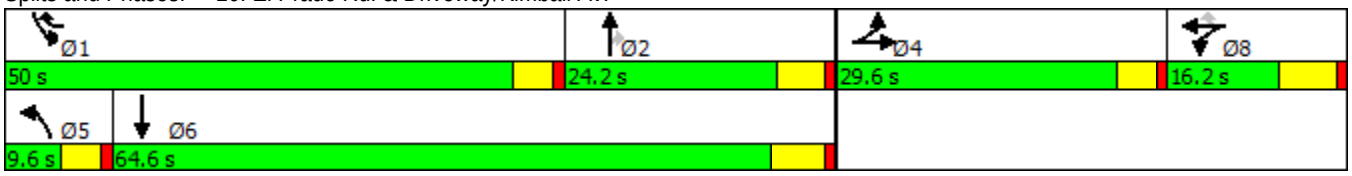
Intersection Summary	
HCM 2010 Ctrl Delay	39.0
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	1	26	1253	5	282	32	733	205
Future Volume (vph)	11	1	26	1253	5	282	32	733	205
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	50.0	9.6	24.2	24.2	50.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	41.7%	8.0%	20.2%	20.2%	41.7%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	59.0	5.1	19.5	19.5	46.6	60.4
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.63
v/c Ratio	0.05	0.01	0.30	1.08	0.06	0.79	0.08	0.49	0.23
Control Delay	40.1	30.3	49.9	63.7	52.6	56.2	0.3	21.2	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.3	49.9	63.7	52.6	56.2	0.3	21.2	11.3
LOS	D	C	D	E	D	E	A	C	B
Approach Delay		38.0	63.1			50.5			18.7
Approach LOS		D	E			D			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 44.8	Intersection LOS: D
Intersection Capacity Utilization 117.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	2	28	26	1253	5	282	32	733	205	43
Future Volume (veh/h)	11	1	2	28	26	1253	5	282	32	733	205	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	1	1	29	27	418	5	288	33	748	209	44
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	52	27	27	140	130	661	125	377	320	874	592	125
Arrive On Green	0.03	0.03	0.03	0.15	0.15	0.15	0.08	0.21	0.21	0.28	0.41	0.41
Sat Flow, veh/h	1619	827	827	909	846	1530	1619	1800	1530	3141	1442	304
Grp Volume(v), veh/h	11	0	2	56	0	418	5	288	33	748	0	253
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1570	0	1746
Q Serve(g_s), s	0.4	0.0	0.1	1.8	0.0	10.0	0.2	9.8	1.1	14.7	0.0	6.5
Cycle Q Clear(g_c), s	0.4	0.0	0.1	1.8	0.0	10.0	0.2	9.8	1.1	14.7	0.0	6.5
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	52	0	53	270	0	661	125	377	320	874	0	717
V/C Ratio(X)	0.21	0.00	0.04	0.21	0.00	0.63	0.04	0.76	0.10	0.86	0.00	0.35
Avail Cap(c_a), veh/h	623	0	637	270	0	661	125	527	448	2196	0	1581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.6	0.0	30.5	24.0	0.0	14.4	27.8	24.2	20.8	22.2	0.0	13.2
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.4	0.0	2.0	0.0	4.3	0.1	1.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	0.9	0.0	6.2	0.1	5.3	0.5	6.5	0.0	3.2
LnGrp Delay(d),s/veh	32.6	0.0	30.7	24.4	0.0	16.4	27.8	28.5	20.9	23.2	0.0	13.5
LnGrp LOS	C		C	C		B	C	C	C	C		B
Approach Vol, veh/h		13			474			326			1001	
Approach Delay, s/veh		32.3			17.3			27.7			20.7	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.7	19.4		6.7	9.6	32.5		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	45.4	* 19		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	16.7	11.8		2.4	2.2	8.5		12.0
Green Ext Time (p_c), s	1.4	1.8		0.0	0.0	3.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.2
HCM 2010 LOS	C

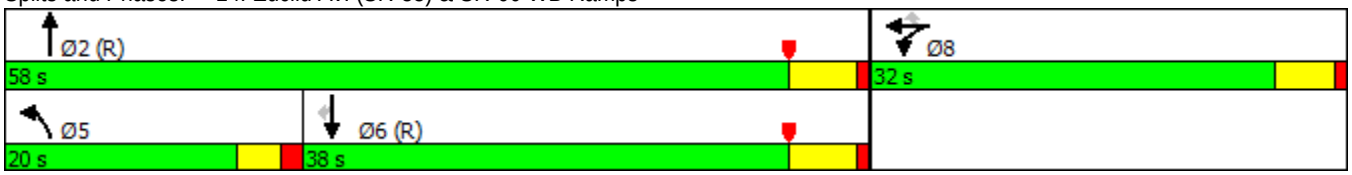
Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	732	2	378	453	963	1034	480
Future Volume (vph)	732	2	378	453	963	1034	480
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	32.0	32.0	32.0	20.0	58.0	38.0	38.0
Total Split (%)	35.6%	35.6%	35.6%	22.2%	64.4%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	26.0	26.0	26.0	15.3	53.5	33.7	33.7
Actuated g/C Ratio	0.29	0.29	0.29	0.17	0.59	0.37	0.37
v/c Ratio	0.94	0.92	0.74	0.92	0.51	0.87	0.59
Control Delay	62.9	57.9	31.2	41.6	17.1	35.5	5.1
Queue Delay	49.2	50.6	0.0	0.0	0.6	0.0	0.0
Total Delay	112.1	108.5	31.2	41.6	17.7	35.5	5.1
LOS	F	F	C	D	B	D	A
Approach Delay		86.1			25.3	25.9	
Approach LOS		F			C	C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 42.3 — Intersection LOS: D
Intersection Capacity Utilization 93.4% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	732	2	378	453	963	0	0	1034	480
Future Volume (veh/h)	0	0	0	732	2	378	453	963	0	0	1034	480
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				866	0	168	487	1035	0	0	1112	516
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				932	0	440	541	2036	0	0	1276	559
Arrive On Green				0.29	0.00	0.29	0.06	0.20	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1530	3141	3510	0	0	3510	1497
Grp Volume(v), veh/h				866	0	168	487	1035	0	0	1112	516
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1570	1710	0	0	1710	1497
Q Serve(g_s), s				23.4	0.0	7.9	13.9	24.3	0.0	0.0	27.2	29.7
Cycle Q Clear(g_c), s				23.4	0.0	7.9	13.9	24.3	0.0	0.0	27.2	29.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				932	0	440	541	2036	0	0	1276	559
V/C Ratio(X)				0.93	0.00	0.38	0.90	0.51	0.00	0.00	0.87	0.92
Avail Cap(c_a), veh/h				971	0	459	541	2036	0	0	1276	559
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.48	0.48	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.1	0.0	25.6	41.7	24.4	0.0	0.0	26.2	27.0
Incr Delay (d2), s/veh				14.0	0.0	0.2	9.7	0.4	0.0	0.0	8.3	23.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.3	0.0	3.3	6.8	11.7	0.0	0.0	14.3	15.8
LnGrp Delay(d),s/veh				45.2	0.0	25.8	51.4	24.8	0.0	0.0	34.5	50.3
LnGrp LOS				D		C	D	C			C	D
Approach Vol, veh/h					1034			1522			1628	
Approach Delay, s/veh					42.0			33.3			39.5	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		59.1			20.0	39.1		30.9
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		52.5			15.5	32.5		27.0
Max Q Clear Time (g_c+I1), s		26.3			15.9	31.7		25.4
Green Ext Time (p_c), s		22.9			0.0	0.8		0.5

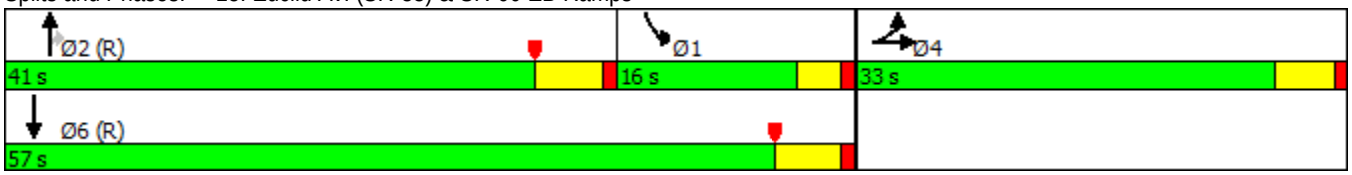
Intersection Summary	
HCM 2010 Ctrl Delay	37.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	337	0	1079	638	299	1467
Future Volume (vph)	337	0	1079	638	299	1467
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	33.0	33.0	41.0	41.0	16.0	57.0
Total Split (%)	36.7%	36.7%	45.6%	45.6%	17.8%	63.3%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lead	Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	28.5	28.5	35.5	35.5	11.5	51.0
Actuated g/C Ratio	0.32	0.32	0.39	0.39	0.13	0.57
v/c Ratio	0.67	1.30	0.85	0.68	0.79	0.81
Control Delay	34.8	172.4	32.4	5.5	53.3	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	48.1
Total Delay	34.8	172.4	32.4	5.5	53.3	71.1
LOS	C	F	C	A	D	E
Approach Delay		128.3	22.4			68.1
Approach LOS		F	C			E

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 63.2	Intersection LOS: E
Intersection Capacity Utilization 93.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	337	0	609	0	0	0	0	1079	638	299	1467	0
Future Volume (veh/h)	337	0	609	0	0	0	0	1079	638	299	1467	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	359	0	565				0	1148	679	318	1561	0
Adj No. of Lanes	1	1	0				0	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	504	0	476				0	1349	602	677	2295	0
Arrive On Green	0.31	0.00	0.31				0.00	0.39	0.39	0.22	0.67	0.00
Sat Flow, veh/h	1619	0	1530				0	3510	1525	3141	3510	0
Grp Volume(v), veh/h	359	0	565				0	1148	679	318	1561	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1525	1570	1710	0
Q Serve(g_s), s	17.7	0.0	28.0				0.0	27.5	35.5	8.0	24.9	0.0
Cycle Q Clear(g_c), s	17.7	0.0	28.0				0.0	27.5	35.5	8.0	24.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	504	0	476				0	1349	602	677	2295	0
V/C Ratio(X)	0.71	0.00	1.19				0.00	0.85	1.13	0.47	0.68	0.00
Avail Cap(c_a), veh/h	504	0	476				0	1349	602	677	2295	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.73	0.73	0.34	0.34	0.00
Uniform Delay (d), s/veh	27.4	0.0	31.0				0.0	24.8	27.2	30.8	9.0	0.0
Incr Delay (d2), s/veh	4.1	0.0	103.6				0.0	5.2	73.0	0.1	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	0.0	25.5				0.0	13.9	27.1	3.5	11.7	0.0
LnGrp Delay(d),s/veh	31.5	0.0	134.6				0.0	30.0	100.3	30.9	9.5	0.0
LnGrp LOS	C		F					C	F	C	A	
Approach Vol, veh/h		924						1827			1879	
Approach Delay, s/veh		94.6						56.1			13.1	
Approach LOS		F						E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.1	41.0		33.0		66.1		
Change Period (Y+Rc), s	5.5	* 5.5		5.0		5.5		
Max Green Setting (Gmax), s	12.0	* 36		28.0		51.5		
Max Q Clear Time (g_c+I1), s	10.0	37.5		30.0		26.9		
Green Ext Time (p_c), s	0.8	0.0		0.0		17.1		

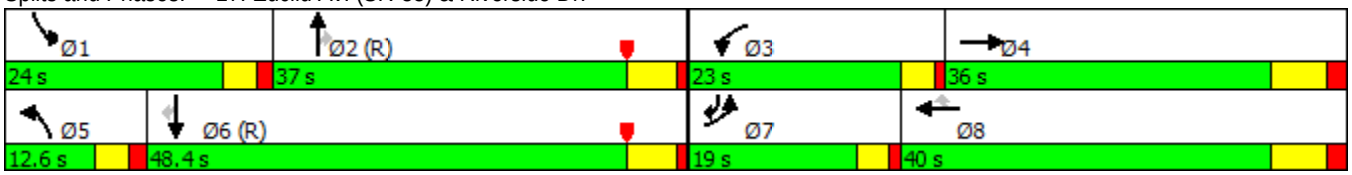
Intersection Summary	
HCM 2010 Ctrl Delay	46.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	330	175	388	51	63	964	171	182	1044	150
Future Volume (vph)	145	330	175	388	51	63	964	171	182	1044	150
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	19.0	36.0	23.0	40.0	40.0	12.6	37.0	37.0	24.0	48.4	19.0
Total Split (%)	15.8%	30.0%	19.2%	33.3%	33.3%	10.5%	30.8%	30.8%	20.0%	40.3%	15.8%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	14.0	21.1	16.7	23.8	23.8	9.2	42.8	42.8	18.4	54.2	73.7
Actuated g/C Ratio	0.12	0.18	0.14	0.20	0.20	0.08	0.36	0.36	0.15	0.45	0.61
v/c Ratio	0.82	0.67	0.82	0.60	0.13	0.54	0.58	0.27	0.78	0.49	0.16
Control Delay	83.1	49.8	77.9	46.8	0.7	60.3	30.3	11.5	48.5	17.3	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.1	49.8	77.9	46.8	0.7	60.3	30.3	11.5	48.5	17.3	6.8
LOS	F	D	E	D	A	E	C	B	D	B	A
Approach Delay		59.0		51.8			29.2			20.3	
Approach LOS		E		D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 68 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 33.9	Intersection LOS: C
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	330	53	175	388	51	63	964	171	182	1044	150
Future Volume (veh/h)	145	330	53	175	388	51	63	964	171	182	1044	150
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	153	347	33	184	408	49	66	1015	99	192	1099	92
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	177	530	50	208	641	286	83	1929	601	220	2345	897
Arrive On Green	0.11	0.17	0.17	0.13	0.19	0.19	0.02	0.13	0.13	0.04	0.16	0.16
Sat Flow, veh/h	1619	3154	298	1619	3420	1528	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	153	187	193	184	408	49	66	1015	99	192	1099	92
Grp Sat Flow(s),veh/h/ln	1619	1710	1742	1619	1710	1528	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	11.2	12.3	12.4	13.4	13.2	3.2	4.9	23.2	6.9	14.1	24.4	4.9
Cycle Q Clear(g_c), s	11.2	12.3	12.4	13.4	13.2	3.2	4.9	23.2	6.9	14.1	24.4	4.9
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	287	293	208	641	286	83	1929	601	220	2345	897
V/C Ratio(X)	0.87	0.65	0.66	0.88	0.64	0.17	0.80	0.53	0.16	0.87	0.47	0.10
Avail Cap(c_a), veh/h	202	413	421	256	941	420	109	1929	601	263	2345	897
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.70	0.70	0.70	0.61	0.61	0.61
Uniform Delay (d), s/veh	52.6	46.6	46.7	51.4	45.0	40.9	58.4	41.8	34.7	56.3	36.7	18.2
Incr Delay (d2), s/veh	25.4	3.5	3.6	22.0	1.5	0.4	18.9	0.7	0.4	15.7	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	6.1	6.3	7.3	6.4	1.4	2.6	10.6	3.0	7.3	11.2	2.1
LnGrp Delay(d),s/veh	77.9	50.2	50.3	73.4	46.5	41.3	77.3	42.5	35.1	72.0	37.1	18.3
LnGrp LOS	E	D	D	E	D	D	E	D	D	E	D	B
Approach Vol, veh/h		533			641			1180			1383	
Approach Delay, s/veh		58.2			53.8			43.8			40.7	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.8	52.6	19.5	27.2	10.6	62.8	17.1	29.5
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	19.5	31.5	19.0	29.0	8.1	42.9	15.0	33.0
Max Q Clear Time (g_c+I1), s	16.1	25.2	15.4	14.4	6.9	26.4	13.2	15.2
Green Ext Time (p_c), s	0.2	5.4	0.1	5.5	0.0	12.0	0.0	6.1

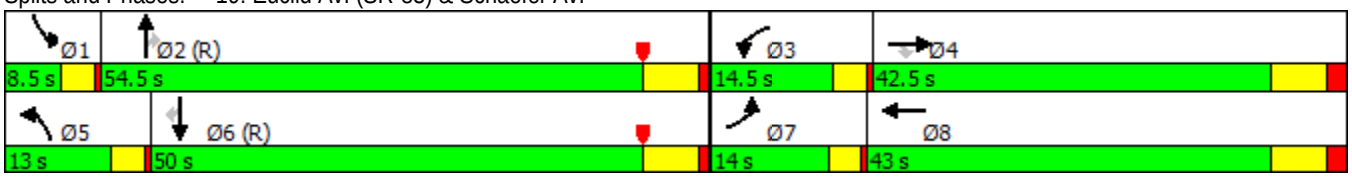
Intersection Summary	
HCM 2010 Ctrl Delay	46.4
HCM 2010 LOS	D

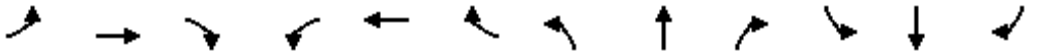
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	61	115	56	119	118	1409	21	15	1587	132
Future Volume (vph)	139	61	115	56	119	118	1409	21	15	1587	132
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	42.5	42.5	14.5	43.0	13.0	54.5	54.5	8.5	50.0	50.0
Total Split (%)	11.7%	35.4%	35.4%	12.1%	35.8%	10.8%	45.4%	45.4%	7.1%	41.7%	41.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.1	22.0	22.0	10.3	17.6	14.4	70.2	70.2	5.4	56.0	56.0
Actuated g/C Ratio	0.10	0.18	0.18	0.09	0.15	0.12	0.58	0.58	0.04	0.47	0.47
v/c Ratio	0.91	0.20	0.32	0.43	0.55	0.65	0.52	0.02	0.22	0.74	0.18
Control Delay	105.6	42.6	8.5	62.4	51.3	42.4	21.0	2.4	84.3	11.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.6	42.6	8.5	62.4	51.3	42.4	21.0	2.4	84.3	11.3	0.8
LOS	F	D	A	E	D	D	C	A	F	B	A
Approach Delay		58.0			54.5		22.4			11.2	
Approach LOS		E			D		C			B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 21.9 — Intersection LOS: C
Intersection Capacity Utilization 73.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	61	115	56	119	17	118	1409	21	15	1587	132
Future Volume (veh/h)	139	61	115	56	119	17	118	1409	21	15	1587	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	148	65	70	60	127	16	126	1499	17	16	1688	92
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	142	214	182	117	162	20	128	3071	956	28	2767	841
Arrive On Green	0.09	0.12	0.12	0.07	0.10	0.10	0.03	0.21	0.21	0.01	0.38	0.38
Sat Flow, veh/h	1619	1800	1530	1619	1568	197	1619	4914	1530	1619	4914	1494
Grp Volume(v), veh/h	148	65	70	60	0	143	126	1499	17	16	1688	92
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1765	1619	1638	1530	1619	1638	1494
Q Serve(g_s), s	10.5	4.0	5.1	4.3	0.0	9.5	9.3	32.3	1.1	1.2	33.3	4.8
Cycle Q Clear(g_c), s	10.5	4.0	5.1	4.3	0.0	9.5	9.3	32.3	1.1	1.2	33.3	4.8
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	142	214	182	117	0	183	128	3071	956	28	2767	841
V/C Ratio(X)	1.04	0.30	0.38	0.51	0.00	0.78	0.98	0.49	0.02	0.57	0.61	0.11
Avail Cap(c_a), veh/h	142	533	453	148	0	530	128	3071	956	67	2767	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.68	0.68	0.68	0.43	0.43	0.43
Uniform Delay (d), s/veh	54.8	48.3	48.8	53.7	0.0	52.5	58.4	30.7	18.3	58.9	26.7	17.8
Incr Delay (d2), s/veh	88.0	0.6	1.0	1.3	0.0	5.4	60.3	0.4	0.0	2.9	0.4	0.1
Initial Q Delay(d3),s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	2.0	2.2	2.0	0.0	4.9	6.3	14.8	0.5	0.6	15.2	2.0
LnGrp Delay(d),s/veh	143.0	48.9	49.8	55.0	0.0	57.8	118.6	31.1	18.3	61.8	27.1	17.9
LnGrp LOS	F	D	D	D		E	F	C	B	E	C	B
Approach Vol, veh/h		283			203			1642			1796	
Approach Delay, s/veh		98.3			57.0			37.7			27.0	
Approach LOS		F			E			D			C	

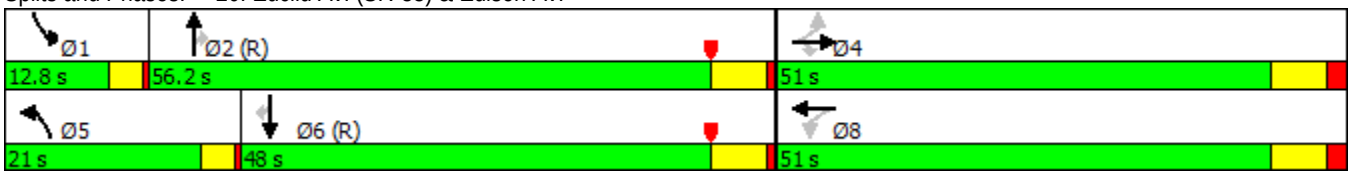
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	81.0	12.1	21.3	13.0	73.6	14.0	19.4
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	48.5	11.0	35.5	9.5	44.0	10.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	34.3	6.3	7.1	11.3	35.3	12.5	11.5
Green Ext Time (p_c), s	0.0	13.0	0.0	1.0	0.0	8.1	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	214	166	221	66	342	245	1260	36	41	1429	247
Future Volume (vph)	214	166	221	66	342	245	1260	36	41	1429	247
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	21.0	56.2	56.2	12.8	48.0	48.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	17.5%	46.8%	46.8%	10.7%	40.0%	40.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.5	44.5	44.5	44.5	44.5	17.5	53.2	53.2	7.5	41.5	41.5
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.15	0.44	0.44	0.06	0.35	0.35
v/c Ratio	1.04	0.27	0.33	0.18	0.61	1.11	0.61	0.05	0.44	0.89	0.41
Control Delay	110.1	27.9	4.6	27.3	35.4	128.7	17.5	1.4	79.2	31.0	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.1	27.9	4.6	27.3	35.4	128.7	17.5	1.4	79.2	31.0	10.0
LOS	F	C	A	C	D	F	B	A	E	C	B
Approach Delay		48.6			34.2		34.8			29.1	
Approach LOS		D			C		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 34.4	Intersection LOS: C
Intersection Capacity Utilization 99.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	214	166	221	66	342	39	245	1260	36	41	1429	247
Future Volume (veh/h)	214	166	221	66	342	39	245	1260	36	41	1429	247
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	228	177	168	70	364	39	261	1340	23	44	1520	232
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	229	660	561	356	586	63	236	2271	707	54	1720	535
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.29	0.92	0.92	0.03	0.35	0.35
Sat Flow, veh/h	942	1800	1530	994	1598	171	1619	4914	1530	1619	4914	1528
Grp Volume(v), veh/h	228	177	168	70	0	403	261	1340	23	44	1520	232
Grp Sat Flow(s),veh/h/ln	942	1800	1530	994	0	1770	1619	1638	1530	1619	1638	1528
Q Serve(g_s), s	21.6	8.3	9.4	6.4	0.0	22.4	17.5	5.4	0.1	3.2	34.9	14.0
Cycle Q Clear(g_c), s	44.0	8.3	9.4	14.7	0.0	22.4	17.5	5.4	0.1	3.2	34.9	14.0
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	660	561	356	0	649	236	2271	707	54	1720	535
V/C Ratio(X)	0.99	0.27	0.30	0.20	0.00	0.62	1.11	0.59	0.03	0.81	0.88	0.43
Avail Cap(c_a), veh/h	229	660	561	356	0	649	236	2271	707	125	1720	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	0.65	0.65	0.65
Uniform Delay (d), s/veh	52.0	26.7	27.0	31.8	0.0	31.2	42.5	2.6	2.4	57.6	36.7	29.9
Incr Delay (d2), s/veh	57.5	0.2	0.3	0.3	0.0	1.8	82.5	0.9	0.1	6.7	4.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	4.2	4.0	1.8	0.0	11.3	13.1	2.2	0.1	1.6	16.5	6.1
LnGrp Delay(d),s/veh	109.5	26.9	27.3	32.1	0.0	33.0	125.0	3.5	2.5	64.3	41.4	31.6
LnGrp LOS	F	C	C	C		C	F	A	A	E	D	C
Approach Vol, veh/h		573			473			1624			1796	
Approach Delay, s/veh		59.9			32.9			23.0			40.7	
Approach LOS		E			C			C			D	

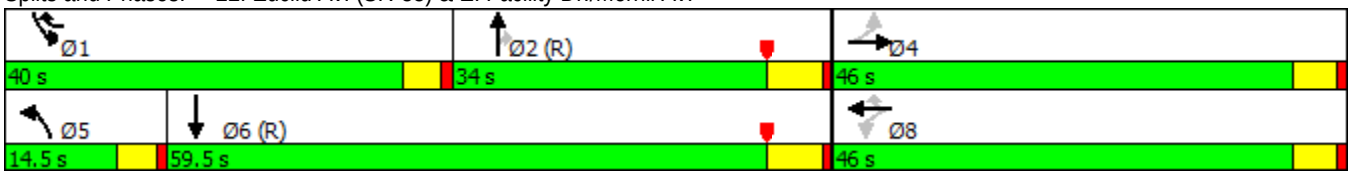
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	61.5		51.0	21.0	48.0		51.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.3	50.2		44.0	17.5	42.0		44.0
Max Q Clear Time (g_c+I1), s	5.2	7.4		46.0	19.5	36.9		24.4
Green Ext Time (p_c), s	0.0	31.4		0.0	0.0	4.8		5.3

Intersection Summary		
HCM 2010 Ctrl Delay		35.9
HCM 2010 LOS		D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	8	6	379	47	606	19	1030	179	475	1399
Future Volume (vph)	8	6	379	47	606	19	1030	179	475	1399
Turn Type	Perm	NA	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	1	5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	40.0	14.5	34.0	34.0	40.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	33.3%	12.1%	28.3%	28.3%	33.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	77.0	10.0	28.0	28.0	35.5	62.2
Actuated g/C Ratio		0.34		0.34	0.64	0.08	0.23	0.23	0.30	0.52
v/c Ratio		0.04		0.98	0.64	0.15	0.94	0.43	1.04	0.59
Control Delay		22.5		77.6	13.8	61.4	46.9	13.4	71.7	14.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.5		77.6	13.8	61.4	46.9	13.4	71.7	14.9
LOS		C		E	B	E	D	B	E	B
Approach Delay		22.5		40.2			42.3			29.0
Approach LOS		C		D			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 94.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	379	47	606	19	1030	179	475	1399	43
Future Volume (veh/h)	8	6	4	379	47	606	19	1030	179	475	1399	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	395	49	585	20	1073	160	495	1457	42
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	44	27	6	330	34	968	66	1147	357	479	2399	69
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.04	0.23	0.23	0.30	0.49	0.49
Sat Flow, veh/h	0	79	17	801	99	1509	1619	4914	1530	1619	4910	142
Grp Volume(v), veh/h	17	0	0	444	0	585	20	1073	160	495	972	527
Grp Sat Flow(s),veh/h/ln	96	0	0	900	0	1509	1619	1638	1530	1619	1638	1775
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	27.5	1.4	25.7	10.7	35.5	25.9	25.9
Cycle Q Clear(g_c), s	41.0	0.0	0.0	41.0	0.0	27.5	1.4	25.7	10.7	35.5	25.9	25.9
Prop In Lane	0.47		0.18	0.89		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	77	0	0	364	0	968	66	1147	357	479	1601	867
V/C Ratio(X)	0.22	0.00	0.00	1.22	0.00	0.60	0.30	0.94	0.45	1.03	0.61	0.61
Avail Cap(c_a), veh/h	77	0	0	364	0	968	135	1147	357	479	1601	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	0.0	42.7	0.0	12.9	55.9	45.1	39.4	42.2	22.3	22.3
Incr Delay (d2), s/veh	0.5	0.0	0.0	120.9	0.0	0.8	0.8	13.5	3.5	50.0	1.7	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	24.3	0.0	11.5	0.7	13.1	4.9	22.5	12.0	13.3
LnGrp Delay(d),s/veh	33.0	0.0	0.0	163.6	0.0	13.6	56.8	58.6	42.9	92.3	24.0	25.5
LnGrp LOS	C			F		B	E	E	D	F	C	C
Approach Vol, veh/h		17			1029			1253			1994	
Approach Delay, s/veh		33.0			78.3			56.5			41.3	
Approach LOS		C			E			E			D	

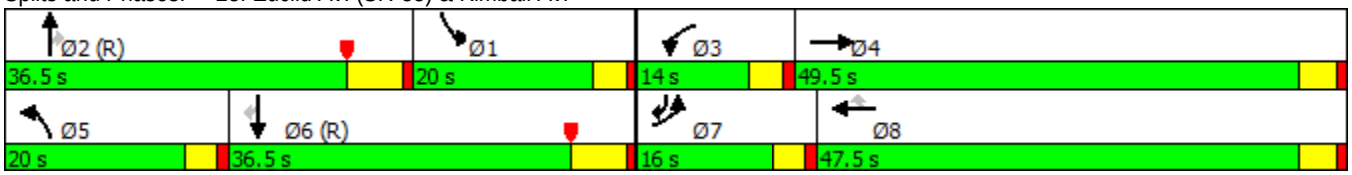
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	40.0	34.0		46.0	9.4	64.6		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	35.5	28.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	37.5	27.7		43.0	3.4	27.9		43.0
Green Ext Time (p_c), s	0.0	0.3		0.0	0.0	18.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	54.6
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	274	320	128	578	129	172	770	188	332	713	614
Future Volume (vph)	274	320	128	578	129	172	770	188	332	713	614
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	45.5	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	16.0	49.5	14.0	47.5	47.5	20.0	36.5	36.5	20.0	36.5	16.0
Total Split (%)	13.3%	41.3%	11.7%	39.6%	39.6%	16.7%	30.4%	30.4%	16.7%	30.4%	13.3%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.5	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	18.5	33.0	13.5	28.0	28.0	16.7	38.4	38.4	16.6	38.4	58.8
Actuated g/C Ratio	0.15	0.28	0.11	0.23	0.23	0.14	0.32	0.32	0.14	0.32	0.49
v/c Ratio	0.58	0.40	0.72	0.74	0.28	0.79	0.50	0.31	0.78	0.46	0.77
Control Delay	54.0	34.7	74.6	47.8	4.2	56.1	30.8	12.4	60.3	32.2	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	34.7	74.6	47.8	4.2	56.1	30.8	12.4	60.3	32.2	30.9
LOS	D	C	E	D	A	E	C	B	E	C	C
Approach Delay		43.0		45.2			31.6			37.3	
Approach LOS		D		D			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 49 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 38.2	Intersection LOS: D
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	320	45	128	578	129	172	770	188	332	713	614
Future Volume (veh/h)	274	320	45	128	578	129	172	770	188	332	713	614
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	280	327	44	131	590	110	176	786	184	339	728	589
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	314	709	95	135	742	332	202	1006	313	966	1987	764
Arrive On Green	0.10	0.23	0.23	0.08	0.22	0.22	0.04	0.07	0.07	0.31	0.40	0.40
Sat Flow, veh/h	3141	3034	405	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	280	183	188	131	590	110	176	786	184	339	728	589
Grp Sat Flow(s),veh/h/ln	1570	1710	1729	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	10.6	11.0	11.2	9.7	19.6	3.6	13.0	18.9	11.1	10.1	12.4	38.0
Cycle Q Clear(g_c), s	10.6	11.0	11.2	9.7	19.6	3.6	13.0	18.9	11.1	10.1	12.4	38.0
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	314	399	404	135	742	332	202	1006	313	966	1987	764
V/C Ratio(X)	0.89	0.46	0.47	0.97	0.80	0.33	0.87	0.78	0.59	0.35	0.37	0.77
Avail Cap(c_a), veh/h	314	641	648	135	1226	548	216	1249	389	966	1987	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.75	0.75	0.75	0.78	0.78	0.78
Uniform Delay (d), s/veh	53.4	39.5	39.5	54.9	44.5	9.7	56.6	53.3	31.9	32.2	25.0	24.2
Incr Delay (d2), s/veh	23.5	0.8	0.8	68.0	0.8	0.2	21.8	4.6	5.9	0.1	0.4	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	5.3	5.5	6.9	9.3	1.5	7.1	9.0	5.2	4.4	5.7	17.0
LnGrp Delay(d),s/veh	76.8	40.2	40.3	122.9	45.2	10.0	78.4	57.9	37.8	32.3	25.4	30.0
LnGrp LOS	E	D	D	F	D	A	E	E	D	C	C	C
Approach Vol, veh/h		651			831			1146			1656	
Approach Delay, s/veh		56.0			52.8			57.8			28.4	
Approach LOS		E			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.9	30.6	14.0	32.5	19.0	54.5	16.0	30.5
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.0	* 31	10.0	45.0	16.0	30.5	12.0	43.0
Max Q Clear Time (g_c+I1), s	12.1	20.9	11.7	13.2	15.0	40.0	12.6	21.6
Green Ext Time (p_c), s	2.5	3.7	0.0	4.7	0.0	0.0	0.0	4.4

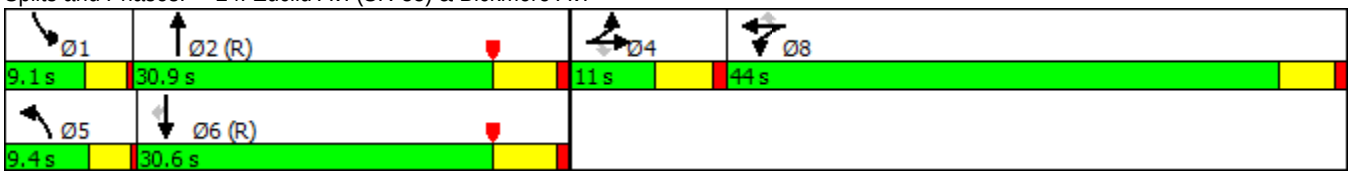
Intersection Summary	
HCM 2010 Ctrl Delay	45.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	85	28	51	275	403	253	79	763	71	674	110
Future Volume (vph)	85	28	51	275	403	253	79	763	71	674	110
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	11.0	11.0	11.0	44.0	44.0	44.0	9.4	30.9	9.1	30.6	30.6
Total Split (%)	11.6%	11.6%	11.6%	46.3%	46.3%	46.3%	9.9%	32.5%	9.6%	32.2%	32.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	6.5	6.5	6.5	31.1	31.1	31.1	8.2	30.6	7.7	30.1	30.1
Actuated g/C Ratio	0.07	0.07	0.07	0.33	0.33	0.33	0.09	0.32	0.08	0.32	0.32
v/c Ratio	0.81	0.24	0.25	0.53	0.82	0.42	0.60	0.78	0.58	0.66	0.21
Control Delay	92.7	47.5	2.6	28.8	41.3	7.7	62.0	36.8	61.8	33.0	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.7	47.5	2.6	28.8	41.3	7.7	62.0	36.8	61.8	33.0	6.0
LOS	F	D	A	C	D	A	E	D	E	C	A
Approach Delay		57.0			28.9			39.0		32.0	
Approach LOS		E			C			D		C	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 34.6	Intersection LOS: C
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	28	51	275	403	253	79	763	40	71	674	110
Future Volume (veh/h)	85	28	51	275	403	253	79	763	40	71	674	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	90	30	52	293	429	256	84	812	42	76	717	108
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	102	114	96	441	490	416	101	1345	70	94	1377	616
Arrive On Green	0.06	0.06	0.06	0.27	0.27	0.27	0.06	0.41	0.41	0.06	0.40	0.40
Sat Flow, veh/h	1619	1800	1523	1619	1800	1530	1619	3309	171	1619	3420	1530
Grp Volume(v), veh/h	90	30	52	293	429	256	84	420	434	76	717	108
Grp Sat Flow(s),veh/h/ln	1619	1800	1523	1619	1800	1530	1619	1710	1770	1619	1710	1530
Q Serve(g_s), s	5.2	1.5	3.1	15.3	21.6	13.9	4.9	18.3	18.3	4.4	15.1	4.3
Cycle Q Clear(g_c), s	5.2	1.5	3.1	15.3	21.6	13.9	4.9	18.3	18.3	4.4	15.1	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	102	114	96	441	490	416	101	695	719	94	1377	616
V/C Ratio(X)	0.88	0.26	0.54	0.67	0.88	0.61	0.84	0.60	0.60	0.80	0.52	0.18
Avail Cap(c_a), veh/h	102	114	96	665	739	628	101	695	719	95	1377	616
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.39	0.39	0.39	0.86	0.86	0.86
Uniform Delay (d), s/veh	44.1	42.4	43.2	30.7	33.0	30.2	44.1	22.2	22.2	44.2	21.4	18.2
Incr Delay (d2), s/veh	51.5	0.5	3.4	0.6	5.4	0.6	19.5	1.5	1.5	31.0	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.8	1.4	6.9	11.5	5.9	2.7	8.9	9.2	2.8	7.3	1.9
LnGrp Delay(d),s/veh	95.7	42.9	46.5	31.4	38.5	30.8	63.6	23.7	23.7	75.2	22.7	18.8
LnGrp LOS	F	D	D	C	D	C	E	C	C	E	C	B
Approach Vol, veh/h		172			978			938			901	
Approach Delay, s/veh		71.6			34.3			27.3			26.6	
Approach LOS		E			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.0	44.1		11.0	9.4	43.8		30.8
Change Period (Y+Rc), s	3.5	5.5		5.0	3.5	5.5		5.0
Max Green Setting (Gmax), s	5.6	25.4		6.0	5.9	25.1		39.0
Max Q Clear Time (g_c+I1), s	6.4	20.3		7.2	6.9	17.1		23.6
Green Ext Time (p_c), s	0.0	2.8		0.0	0.0	3.8		2.2

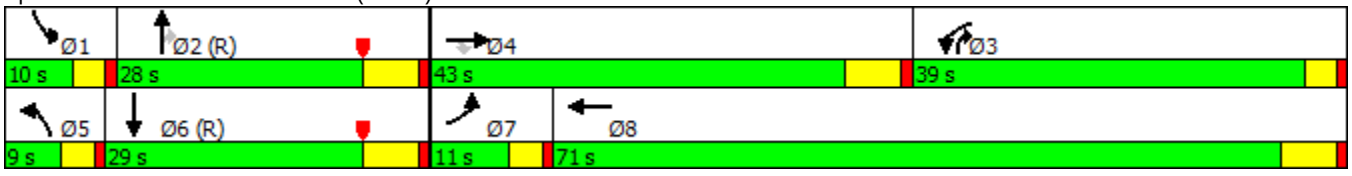
Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	218	33	879	166	58	864	496	82	897
Future Volume (vph)	5	218	33	879	166	58	864	496	82	897
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	11.0	43.0	43.0	39.0	71.0	9.0	28.0	39.0	10.0	29.0
Total Split (%)	9.2%	35.8%	35.8%	32.5%	59.2%	7.5%	23.3%	32.5%	8.3%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.3	22.8	22.8	42.1	66.8	8.0	24.6	68.7	10.5	27.2
Actuated g/C Ratio	0.04	0.19	0.19	0.35	0.56	0.07	0.20	0.57	0.09	0.23
v/c Ratio	0.07	0.65	0.09	0.86	0.27	0.55	0.87	0.48	0.59	0.83
Control Delay	57.0	52.5	0.4	46.3	12.4	74.7	43.0	2.2	58.2	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	52.5	0.4	46.3	12.4	74.7	43.0	2.2	58.2	38.5
LOS	E	D	A	D	B	E	D	A	E	D
Approach Delay		45.9			38.6		30.0			40.2
Approach LOS		D			D		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 40 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 36.3	Intersection LOS: D
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	218	33	879	166	92	58	864	496	82	897	15
Future Volume (veh/h)	5	218	33	879	166	92	58	864	496	82	897	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	220	0	888	168	78	59	873	323	83	906	10
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	266	226	862	521	242	67	1609	936	81	1682	19
Arrive On Green	0.01	0.15	0.00	0.29	0.45	0.45	0.04	0.33	0.33	0.02	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1159	538	1619	4914	1496	1619	5010	55
Grp Volume(v), veh/h	5	220	0	888	0	246	59	873	323	83	592	324
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1697	1619	1638	1496	1619	1638	1789
Q Serve(g_s), s	0.4	14.2	0.0	35.0	0.0	11.2	4.3	17.4	2.8	6.0	20.5	20.5
Cycle Q Clear(g_c), s	0.4	14.2	0.0	35.0	0.0	11.2	4.3	17.4	2.8	6.0	20.5	20.5
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	266	226	862	0	763	67	1609	936	81	1100	600
V/C Ratio(X)	0.48	0.83	0.00	1.03	0.00	0.32	0.87	0.54	0.35	1.03	0.54	0.54
Avail Cap(c_a), veh/h	94	555	472	862	0	919	67	1609	936	81	1100	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.32	0.32	0.32	0.81	0.81	0.81
Uniform Delay (d), s/veh	59.4	49.7	0.0	42.5	0.0	21.3	57.2	33.0	3.5	59.0	44.6	44.6
Incr Delay (d2), s/veh	12.4	9.0	0.0	38.6	0.0	0.3	29.9	0.4	0.3	96.8	1.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.8	0.0	18.9	0.0	5.3	2.5	8.0	2.7	4.9	9.6	10.7
LnGrp Delay(d),s/veh	71.8	58.6	0.0	81.1	0.0	21.6	87.1	33.4	3.8	156.1	46.1	47.4
LnGrp LOS	E	E		F		C	F	C	A	F	D	D
Approach Vol, veh/h		225			1134			1255			999	
Approach Delay, s/veh		58.9			68.2			28.3			55.6	
Approach LOS		E			E			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	45.3	41.0	23.7	9.0	46.3	4.8	60.0
Change Period (Y+Rc), s	4.0	6.0	6.0	* 6	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	22.0	35.0	* 37	5.0	23.0	7.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	19.4	37.0	16.2	6.3	22.5	2.4	13.2
Green Ext Time (p_c), s	0.0	1.9	0.0	1.5	0.0	0.4	0.0	3.7

Intersection Summary	
HCM 2010 Ctrl Delay	50.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	396	407	5	457	19	19	95	12
Future Volume (vph)	396	407	5	457	19	19	95	12
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	31.0	48.8	9.6	27.4	31.6	31.6	31.6	31.6
Total Split (%)	34.4%	54.2%	10.7%	30.4%	35.1%	35.1%	35.1%	35.1%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	23.6	45.4	5.1	18.8		21.8		21.8
Actuated g/C Ratio	0.29	0.57	0.06	0.23		0.27		0.27
v/c Ratio	0.88	0.23	0.05	0.79		0.15		0.81
Control Delay	49.9	10.2	41.2	38.3		24.2		45.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	49.9	10.2	41.2	38.3		24.2		45.2
LOS	D	B	D	D		C		D
Approach Delay		29.5		38.4		24.2		45.2
Approach LOS		C		D		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.1	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 35.0	Intersection LOS: C
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	396	407	11	5	457	122	19	19	18	95	12	192
Future Volume (veh/h)	396	407	11	5	457	122	19	19	18	95	12	192
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	417	428	12	5	481	128	20	20	19	100	13	202
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	458	1770	50	11	652	172	160	154	116	168	36	243
Arrive On Green	0.28	0.52	0.52	0.01	0.24	0.24	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1619	3396	95	1619	2663	703	362	614	463	399	143	969
Grp Volume(v), veh/h	417	215	225	5	308	301	59	0	0	315	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1781	1619	1710	1656	1439	0	0	1511	0	0
Q Serve(g_s), s	17.3	4.8	4.8	0.2	11.5	11.7	0.0	0.0	0.0	10.9	0.0	0.0
Cycle Q Clear(g_c), s	17.3	4.8	4.8	0.2	11.5	11.7	1.9	0.0	0.0	13.6	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.42	0.34		0.32	0.32		0.64
Lane Grp Cap(c), veh/h	458	891	928	11	418	405	430	0	0	447	0	0
V/C Ratio(X)	0.91	0.24	0.24	0.47	0.74	0.74	0.14	0.00	0.00	0.71	0.00	0.00
Avail Cap(c_a), veh/h	615	1049	1092	117	522	505	632	0	0	653	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.0	9.1	9.1	34.4	24.2	24.2	20.2	0.0	0.0	24.5	0.0	0.0
Incr Delay (d2), s/veh	12.4	0.1	0.1	11.3	4.1	4.5	0.1	0.0	0.0	2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	2.2	2.3	0.1	5.9	5.8	0.9	0.0	0.0	5.9	0.0	0.0
LnGrp Delay(d),s/veh	36.4	9.2	9.2	45.6	28.3	28.8	20.4	0.0	0.0	26.6	0.0	0.0
LnGrp LOS	D	A	A	D	C	C	C			C		
Approach Vol, veh/h		857			614			59			315	
Approach Delay, s/veh		22.5			28.7			20.4			26.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	42.4		22.0	24.3	23.2		22.0
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	42.6		27.0	26.4	21.2		27.0
Max Q Clear Time (g_c+I1), s	2.2	6.8		15.6	19.3	13.7		3.9
Green Ext Time (p_c), s	0.0	6.4		1.7	0.4	3.3		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.2
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	192	289	456	118	251
Future Volume (vph)	228	192	289	456	118	251
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	24.0	56.8	32.8	32.8
Total Split (%)	36.9%	36.9%	26.7%	63.1%	36.4%	36.4%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	15.6	13.9	17.0	34.8	13.0	13.0
Actuated g/C Ratio	0.25	0.23	0.28	0.57	0.21	0.21
v/c Ratio	0.60	0.41	0.69	0.48	0.33	0.50
Control Delay	28.0	6.4	32.6	10.3	24.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	6.4	32.6	10.3	24.6	7.0
LOS	C	A	C	B	C	A
Approach Delay				19.0	12.6	
Approach LOS				B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 61.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 47.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	228	0	192	0	0	0	289	456	0	0	118	251
Future Volume (veh/h)	228	0	192	0	0	0	289	456	0	0	118	251
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	245	0	206				311	490	0	0	127	270
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	316	0	299				367	1073	0	0	500	425
Arrive On Green	0.20	0.00	0.20				0.23	0.60	0.00	0.00	0.28	0.28
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1530
Grp Volume(v), veh/h	245	0	206				311	490	0	0	127	270
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1530
Q Serve(g_s), s	7.2	0.0	6.3				9.2	7.5	0.0	0.0	2.7	7.7
Cycle Q Clear(g_c), s	7.2	0.0	6.3				9.2	7.5	0.0	0.0	2.7	7.7
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	316	0	299				367	1073	0	0	500	425
V/C Ratio(X)	0.77	0.00	0.69				0.85	0.46	0.00	0.00	0.25	0.64
Avail Cap(c_a), veh/h	927	0	876				629	1838	0	0	973	827
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	18.7				18.5	5.6	0.0	0.0	14.0	15.8
Incr Delay (d2), s/veh	1.5	0.0	1.1				2.1	0.3	0.0	0.0	0.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	5.2				4.3	3.8	0.0	0.0	1.4	6.6
LnGrp Delay(d),s/veh	20.6	0.0	19.7				20.6	5.9	0.0	0.0	14.3	17.4
LnGrp LOS	C		B				C	A			B	B
Approach Vol, veh/h		451						801			397	
Approach Delay, s/veh		20.2						11.6			16.4	
Approach LOS		C						B			B	

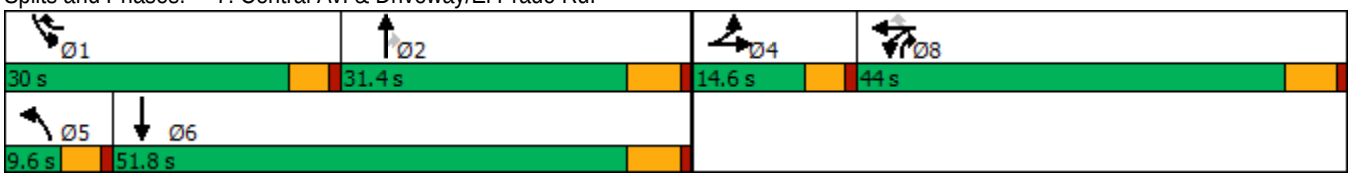
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		35.6		14.4	15.9	19.7		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		51.0		28.6	19.4	27.0		
Max Q Clear Time (g_c+I1), s		9.5		9.2	11.2	9.7		
Green Ext Time (p_c), s		4.9		0.6	0.3	4.1		

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	26	5	729	4	457	9	572	820	567	709
Future Volume (vph)	26	5	729	4	457	9	572	820	567	709
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	44.0	44.0	30.0	9.6	31.4	44.0	30.0	51.8
Total Split (%)	12.2%	12.2%	36.7%	36.7%	25.0%	8.0%	26.2%	36.7%	25.0%	43.2%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.2	10.2	34.2	34.2	63.7	5.1	26.2	60.5	23.5	52.7
Actuated g/C Ratio	0.09	0.09	0.31	0.31	0.57	0.05	0.23	0.54	0.21	0.47
v/c Ratio	0.18	0.16	0.80	0.77	0.49	0.12	0.74	0.87	0.90	0.33
Control Delay	54.4	26.3	50.8	47.4	9.1	59.2	48.4	20.3	61.4	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	26.3	50.8	47.4	9.1	59.2	48.4	20.3	61.4	20.8
LOS	D	C	D	D	A	E	D	C	E	C
Approach Delay		40.6		33.7			32.0			38.6
Approach LOS		D		C			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.5	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 92.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	5	20	729	4	457	9	572	820	567	709	18
Future Volume (veh/h)	26	5	20	729	4	457	9	572	820	567	709	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	27	5	12	762	0	325	9	596	678	591	739	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	112	33	78	892	0	740	18	843	794	654	2199	45
Arrive On Green	0.07	0.07	0.07	0.28	0.00	0.28	0.01	0.25	0.25	0.21	0.44	0.44
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	3141	4955	100
Grp Volume(v), veh/h	27	0	17	762	0	325	9	596	678	591	488	266
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1570	1638	1780
Q Serve(g_s), s	1.6	0.0	1.0	23.1	0.0	14.5	0.6	16.5	25.6	19.1	10.1	10.1
Cycle Q Clear(g_c), s	1.6	0.0	1.0	23.1	0.0	14.5	0.6	16.5	25.6	19.1	10.1	10.1
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	112	0	111	892	0	740	18	843	794	654	1454	790
V/C Ratio(X)	0.24	0.00	0.15	0.85	0.00	0.44	0.50	0.71	0.85	0.90	0.34	0.34
Avail Cap(c_a), veh/h	156	0	154	1191	0	882	78	843	794	768	1454	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	0.0	45.5	35.6	0.0	17.6	51.1	35.7	18.0	40.1	18.9	18.9
Incr Delay (d2), s/veh	0.4	0.0	0.2	4.8	0.0	0.4	8.0	5.0	11.3	11.7	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.5	11.0	0.0	6.2	0.3	8.4	21.7	9.3	4.7	5.2
LnGrp Delay(d),s/veh	46.2	0.0	45.7	40.4	0.0	18.0	59.0	40.7	29.3	51.7	19.5	20.0
LnGrp LOS	D		D	D		B	E	D	C	D	B	C
Approach Vol, veh/h		44			1087			1283			1345	
Approach Delay, s/veh		46.0			33.7			34.8			33.8	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.2	31.4		11.8	5.7	51.9		34.4
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	25.4	25.6		10.0	5.0	46.0		38.2
Max Q Clear Time (g_c+I1), s	21.1	27.6		3.6	2.6	12.1		25.1
Green Ext Time (p_c), s	0.6	0.0		0.0	0.0	7.2		3.5

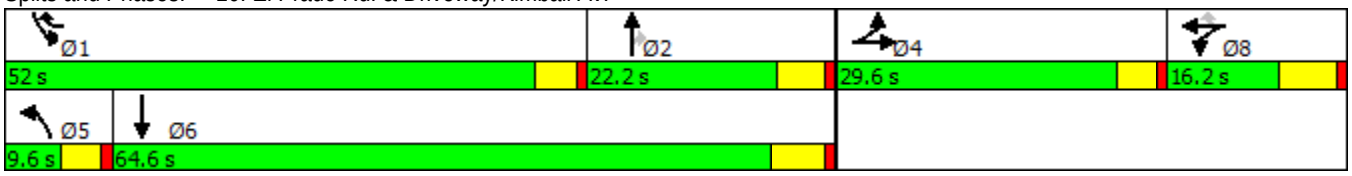
Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	35	8	3	833	4	202	24	978	352
Future Volume (vph)	35	8	3	833	4	202	24	978	352
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	52.0	9.6	22.2	22.2	52.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	43.3%	8.0%	18.5%	18.5%	43.3%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	14.7	14.7	12.8	39.8	6.4	16.8	16.8	32.5	42.1
Actuated g/C Ratio	0.19	0.19	0.16	0.51	0.08	0.22	0.22	0.42	0.54
v/c Ratio	0.12	0.05	0.10	0.82	0.03	0.55	0.06	0.79	0.40
Control Delay	39.6	28.7	45.9	13.0	51.0	43.2	0.2	28.1	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	28.7	45.9	13.0	51.0	43.2	0.2	28.1	15.2
LOS	D	C	D	B	D	D	A	C	B
Approach Delay		36.3	14.0			38.9			24.5
Approach LOS		D	B			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 77.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 86.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	8	8	23	3	833	4	202	24	978	352	14
Future Volume (veh/h)	35	8	8	23	3	833	4	202	24	978	352	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	37	8	6	24	3	426	4	213	24	1029	371	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	138	81	61	193	24	746	102	288	245	1136	791	30
Arrive On Green	0.09	0.09	0.09	0.13	0.13	0.13	0.06	0.16	0.16	0.36	0.46	0.46
Sat Flow, veh/h	1619	956	717	1532	191	1530	1619	1800	1530	3141	1723	65
Grp Volume(v), veh/h	37	0	14	27	0	426	4	213	24	1029	0	385
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1723	0	1530	1619	1800	1530	1570	0	1788
Q Serve(g_s), s	1.7	0.0	0.6	1.1	0.0	10.0	0.2	8.9	1.1	24.7	0.0	11.8
Cycle Q Clear(g_c), s	1.7	0.0	0.6	1.1	0.0	10.0	0.2	8.9	1.1	24.7	0.0	11.8
Prop In Lane	1.00		0.43	0.89		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	138	0	142	217	0	746	102	288	245	1136	0	821
V/C Ratio(X)	0.27	0.00	0.10	0.12	0.00	0.57	0.04	0.74	0.10	0.91	0.00	0.47
Avail Cap(c_a), veh/h	510	0	527	217	0	746	102	385	328	1876	0	1325
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.0	0.0	33.5	30.8	0.0	14.4	34.9	31.8	28.4	24.0	0.0	14.8
Incr Delay (d2), s/veh	1.0	0.0	0.3	0.3	0.0	1.0	0.1	5.1	0.2	2.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.3	0.5	0.0	6.8	0.1	4.8	0.5	11.0	0.0	5.9
LnGrp Delay(d),s/veh	35.0	0.0	33.8	31.1	0.0	15.5	35.0	36.8	28.6	26.5	0.0	15.2
LnGrp LOS	D		C	C		B	C	D	C	C		B
Approach Vol, veh/h		51			453			241			1414	
Approach Delay, s/veh		34.7			16.4			36.0			23.4	
Approach LOS		C			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	33.3	18.5		11.4	9.6	42.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	47.4	* 17		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	26.7	10.9		3.7	2.2	13.8		12.0
Green Ext Time (p_c), s	2.0	1.8		0.1	0.0	3.7		0.0

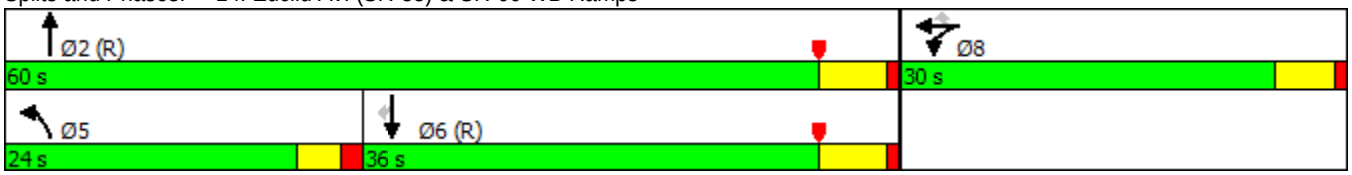
Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	629	6	414	524	1053	928	538
Future Volume (vph)	629	6	414	524	1053	928	538
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	24.0	60.0	36.0	36.0
Total Split (%)	33.3%	33.3%	33.3%	26.7%	66.7%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.1	24.1	24.1	18.4	55.4	32.5	32.5
Actuated g/C Ratio	0.27	0.27	0.27	0.20	0.62	0.36	0.36
v/c Ratio	0.94	0.90	0.76	0.86	0.53	0.79	0.63
Control Delay	64.6	56.1	34.2	37.9	17.8	32.2	5.6
Queue Delay	4.0	2.5	0.0	0.0	0.7	0.0	0.0
Total Delay	68.7	58.7	34.2	37.9	18.5	32.2	5.6
LOS	E	E	C	D	B	C	A
Approach Delay		54.5			24.9	22.4	
Approach LOS		D			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 51 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 31.6	Intersection LOS: C
Intersection Capacity Utilization 100.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	629	6	414	524	1053	0	0	928	538
Future Volume (veh/h)	0	0	0	629	6	414	524	1053	0	0	928	538
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				752	0	190	552	1108	0	0	977	566
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				827	0	386	627	2148	0	0	1294	568
Arrive On Green				0.26	0.00	0.26	0.07	0.21	0.00	0.00	0.38	0.38
Sat Flow, veh/h				3238	0	1510	3141	3510	0	0	3510	1501
Grp Volume(v), veh/h				752	0	190	552	1108	0	0	977	566
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1570	1710	0	0	1710	1501
Q Serve(g_s), s				20.3	0.0	9.6	15.7	25.9	0.0	0.0	22.4	33.9
Cycle Q Clear(g_c), s				20.3	0.0	9.6	15.7	25.9	0.0	0.0	22.4	33.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				827	0	386	627	2148	0	0	1294	568
V/C Ratio(X)				0.91	0.00	0.49	0.88	0.52	0.00	0.00	0.75	1.00
Avail Cap(c_a), veh/h				899	0	420	681	2148	0	0	1294	568
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.49	0.49	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.5	0.0	28.5	41.0	23.5	0.0	0.0	24.3	27.9
Incr Delay (d2), s/veh				11.8	0.0	0.4	6.1	0.4	0.0	0.0	4.1	37.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.4	0.0	4.1	7.4	12.4	0.0	0.0	11.2	19.8
LnGrp Delay(d),s/veh				44.3	0.0	28.9	47.1	24.0	0.0	0.0	28.5	64.9
LnGrp LOS				D		C	D	C			C	E
Approach Vol, veh/h					942			1660			1543	
Approach Delay, s/veh					41.2			31.6			41.8	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			22.5	39.6		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		54.5			19.5	30.5		25.0
Max Q Clear Time (g_c+I1), s		27.9			17.7	35.9		22.3
Green Ext Time (p_c), s		23.1			0.3	0.0		0.7

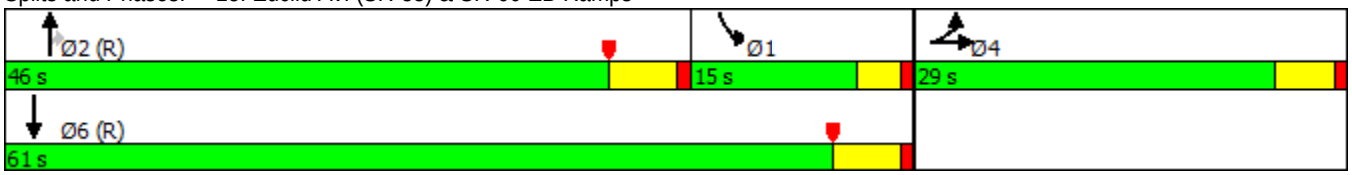
Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	384	2	1194	746	307	1251
Future Volume (vph)	384	2	1194	746	307	1251
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	46.0	46.0	15.0	61.0
Total Split (%)	32.2%	32.2%	51.1%	51.1%	16.7%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lead	Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.3	24.3	40.4	40.4	10.8	55.2
Actuated g/C Ratio	0.27	0.27	0.45	0.45	0.12	0.61
v/c Ratio	0.85	1.34	0.79	0.70	0.84	0.61
Control Delay	52.4	197.2	25.9	5.2	57.8	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	3.7
Total Delay	52.4	197.2	25.9	5.2	57.8	17.5
LOS	D	F	C	A	E	B
Approach Delay		143.4	18.0			25.4
Approach LOS		F	B			C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 47.0	Intersection LOS: D
Intersection Capacity Utilization 100.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	384	2	545	0	0	0	0	1194	746	307	1251	0
Future Volume (veh/h)	384	2	545	0	0	0	0	1194	746	307	1251	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	392	2	479				0	1218	761	313	1277	0
Adj No. of Lanes	1	1	0				0	2	1	2	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	432	2	407				0	1539	677	811	2631	0
Arrive On Green	0.27	0.27	0.27				0.00	0.45	0.45	0.34	1.00	0.00
Sat Flow, veh/h	1619	6	1525				0	3510	1504	3141	3510	0
Grp Volume(v), veh/h	392	0	481				0	1218	761	313	1277	0
Grp Sat Flow(s),veh/h/ln	1619	0	1531				0	1710	1504	1570	1710	0
Q Serve(g_s), s	21.1	0.0	24.0				0.0	27.4	40.5	6.8	0.0	0.0
Cycle Q Clear(g_c), s	21.1	0.0	24.0				0.0	27.4	40.5	6.8	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	408				0	1539	677	811	2631	0
V/C Ratio(X)	0.91	0.00	1.18				0.00	0.79	1.12	0.39	0.49	0.00
Avail Cap(c_a), veh/h	432	0	408				0	1539	677	811	2631	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.61	0.61	0.44	0.44	0.00
Uniform Delay (d), s/veh	31.9	0.0	33.0				0.0	21.1	24.8	24.1	0.0	0.0
Incr Delay (d2), s/veh	22.2	0.0	102.9				0.0	2.6	67.9	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	0.0	21.8				0.0	13.4	29.5	2.9	0.1	0.0
LnGrp Delay(d),s/veh	54.2	0.0	135.9				0.0	23.8	92.7	24.2	0.3	0.0
LnGrp LOS	D		F					C	F	C	A	
Approach Vol, veh/h		873						1979			1590	
Approach Delay, s/veh		99.2						50.3			5.0	
Approach LOS		F						D			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.0	46.0		29.0		75.0		
Change Period (Y+Rc), s	5.5	* 5.5		5.0		5.5		
Max Green Setting (Gmax), s	11.0	* 41		24.0		55.5		
Max Q Clear Time (g_c+I1), s	8.8	42.5		26.0		2.0		
Green Ext Time (p_c), s	0.9	0.0		0.0		19.8		

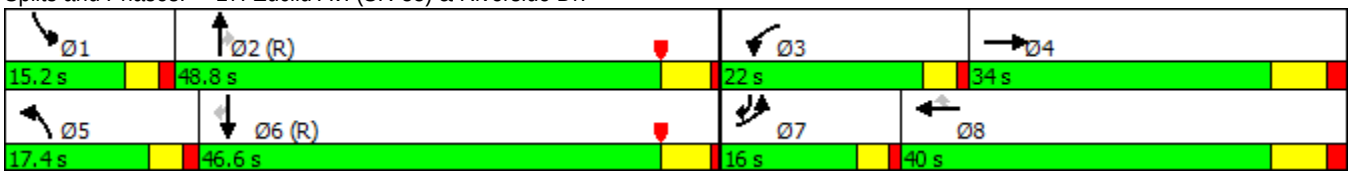
Intersection Summary	
HCM 2010 Ctrl Delay	43.7
HCM 2010 LOS	D

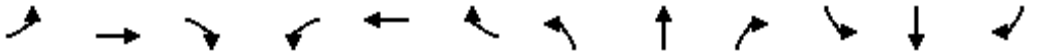
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	149	383	174	344	55	107	1493	273	130	1177	165
Future Volume (vph)	149	383	174	344	55	107	1493	273	130	1177	165
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	16.0	34.0	22.0	40.0	40.0	17.4	48.8	48.8	15.2	46.6	16.0
Total Split (%)	13.3%	28.3%	18.3%	33.3%	33.3%	14.5%	40.7%	40.7%	12.7%	38.8%	13.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.8	23.6	16.4	27.2	27.2	12.2	45.7	45.7	13.3	46.8	61.1
Actuated g/C Ratio	0.11	0.20	0.14	0.23	0.23	0.10	0.38	0.38	0.11	0.39	0.51
v/c Ratio	0.93	0.76	0.85	0.48	0.14	0.71	0.86	0.40	0.78	0.66	0.21
Control Delay	106.4	51.0	82.0	41.3	2.1	55.1	48.5	16.7	66.6	29.1	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.4	51.0	82.0	41.3	2.1	55.1	48.5	16.7	66.6	29.1	11.3
LOS	F	D	F	D	A	E	D	B	E	C	B
Approach Delay		64.2		49.9			44.2			30.4	
Approach LOS		E		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 43.2	Intersection LOS: D
Intersection Capacity Utilization 81.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	383	90	174	344	55	107	1493	273	130	1177	165
Future Volume (veh/h)	149	383	90	174	344	55	107	1493	273	130	1177	165
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	160	412	63	187	370	59	115	1605	163	140	1266	79
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	551	84	211	737	325	139	2065	643	144	2081	792
Arrive On Green	0.10	0.19	0.19	0.13	0.22	0.22	0.03	0.14	0.14	0.03	0.14	0.14
Sat Flow, veh/h	1619	2978	452	1619	3420	1507	1619	4914	1530	1619	4914	1508
Grp Volume(v), veh/h	160	235	240	187	370	59	115	1605	163	140	1266	79
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	1507	1619	1638	1530	1619	1638	1508
Q Serve(g_s), s	11.8	15.6	15.8	13.6	11.4	3.8	8.5	37.8	11.4	10.4	29.1	4.5
Cycle Q Clear(g_c), s	11.8	15.6	15.8	13.6	11.4	3.8	8.5	37.8	11.4	10.4	29.1	4.5
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	317	318	211	737	325	139	2065	643	144	2081	792
V/C Ratio(X)	0.99	0.74	0.75	0.89	0.50	0.18	0.83	0.78	0.25	0.97	0.61	0.10
Avail Cap(c_a), veh/h	162	385	387	243	941	414	174	2065	643	144	2081	792
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.49	0.49	0.49	0.78	0.78	0.78
Uniform Delay (d), s/veh	53.9	46.2	46.3	51.3	41.4	38.4	57.4	46.3	34.9	58.1	42.3	21.9
Incr Delay (d2), s/veh	67.0	7.2	7.6	25.4	0.8	0.4	12.3	1.5	0.5	57.2	1.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	8.0	8.2	7.6	5.5	1.6	4.3	17.5	4.9	6.9	13.4	1.9
LnGrp Delay(d),s/veh	120.9	53.4	53.9	76.7	42.2	38.8	69.8	47.7	35.3	115.2	43.3	22.1
LnGrp LOS	F	D	D	E	D	D	E	D	D	F	D	C
Approach Vol, veh/h		635			616			1883			1485	
Approach Delay, s/veh		70.6			52.3			48.0			49.0	
Approach LOS		E			D			D			D	

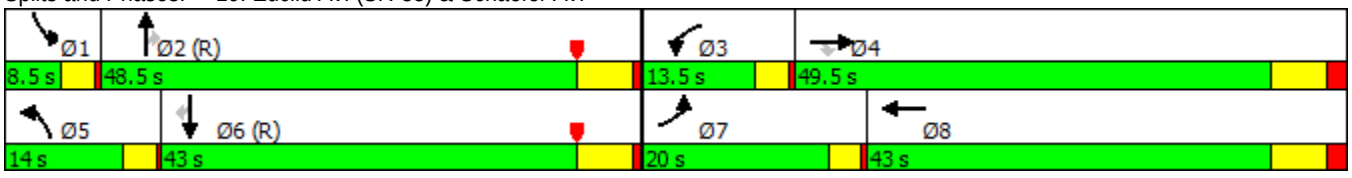
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	55.9	19.7	29.2	14.8	56.3	16.0	32.9
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	10.7	43.3	18.0	27.0	12.9	41.1	12.0	33.0
Max Q Clear Time (g_c+I1), s	12.4	39.8	15.6	17.8	10.5	31.1	13.8	13.4
Green Ext Time (p_c), s	0.0	3.3	0.1	4.4	0.1	9.2	0.0	6.9

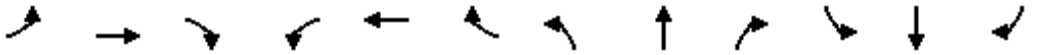
Intersection Summary	
HCM 2010 Ctrl Delay	52.0
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	300	225	186	27	49	118	1794	40	22	1305	132
Future Volume (vph)	300	225	186	27	49	118	1794	40	22	1305	132
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	20.0	49.5	49.5	13.5	43.0	14.0	48.5	48.5	8.5	43.0	43.0
Total Split (%)	16.7%	41.3%	41.3%	11.3%	35.8%	11.7%	40.4%	40.4%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	16.5	25.4	25.4	10.0	15.8	13.0	67.8	67.8	5.7	57.1	57.1
Actuated g/C Ratio	0.14	0.21	0.21	0.08	0.13	0.11	0.56	0.56	0.05	0.48	0.48
v/c Ratio	1.39	0.61	0.41	0.21	0.28	0.70	0.67	0.04	0.30	0.58	0.17
Control Delay	239.9	48.5	6.9	55.4	36.6	54.1	32.0	3.0	60.6	27.5	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	239.9	48.5	6.9	55.4	36.6	54.1	32.0	3.0	60.6	27.5	8.5
LOS	F	D	A	E	D	D	C	A	E	C	A
Approach Delay		118.3			42.2		32.7			26.2	
Approach LOS		F			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.39	
Intersection Signal Delay: 45.1	Intersection LOS: D
Intersection Capacity Utilization 80.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	225	186	27	49	15	118	1794	40	22	1305	132
Future Volume (veh/h)	300	225	186	27	49	15	118	1794	40	22	1305	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	309	232	116	28	51	10	122	1849	32	23	1345	83
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	277	236	82	98	19	142	2980	928	36	2660	810
Arrive On Green	0.14	0.15	0.15	0.05	0.07	0.07	0.06	0.41	0.41	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1463	287	1619	4914	1530	1619	4914	1496
Grp Volume(v), veh/h	309	232	116	28	0	61	122	1849	32	23	1345	83
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1749	1619	1638	1530	1619	1638	1496
Q Serve(g_s), s	16.5	15.0	8.3	2.0	0.0	4.0	9.0	35.8	1.5	1.7	29.7	5.6
Cycle Q Clear(g_c), s	16.5	15.0	8.3	2.0	0.0	4.0	9.0	35.8	1.5	1.7	29.7	5.6
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	277	236	82	0	117	142	2980	928	36	2660	810
V/C Ratio(X)	1.39	0.84	0.49	0.34	0.00	0.52	0.86	0.62	0.03	0.64	0.51	0.10
Avail Cap(c_a), veh/h	223	638	542	135	0	525	142	2980	928	67	2660	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.60	0.60	0.60	0.71	0.71	0.71
Uniform Delay (d), s/veh	51.8	49.3	46.5	55.0	0.0	54.1	55.8	24.7	14.5	59.1	34.8	24.9
Incr Delay (d2), s/veh	199.9	5.0	1.2	0.9	0.0	2.6	25.1	0.6	0.0	4.9	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.7	7.9	3.6	0.9	0.0	2.1	5.0	16.4	0.6	0.8	13.6	2.4
LnGrp Delay(d),s/veh	251.6	54.3	47.7	56.0	0.0	56.8	80.8	25.2	14.5	63.9	35.3	25.1
LnGrp LOS	F	D	D	E		E	F	C	B	E	D	C
Approach Vol, veh/h		657			89			2003			1451	
Approach Delay, s/veh		145.9			56.5			28.5			35.1	
Approach LOS		F			E			C			D	

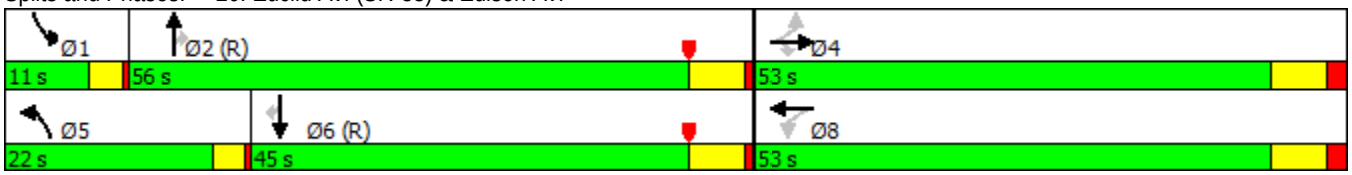
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	78.8	9.6	25.5	14.0	71.0	20.0	15.0
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	42.5	10.0	42.5	10.5	37.0	16.5	36.0
Max Q Clear Time (g_c+I1), s	3.7	37.8	4.0	17.0	11.0	31.7	18.5	6.0
Green Ext Time (p_c), s	0.0	4.5	0.0	1.4	0.0	5.1	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	49.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	343	471	278	28	140	165	1544	76	68	1275	169
Future Volume (vph)	343	471	278	28	140	165	1544	76	68	1275	169
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	22.0	56.0	56.0	11.0	45.0	45.0
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%	18.3%	46.7%	46.7%	9.2%	37.5%	37.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7	15.7	55.3	55.3	7.3	45.1	45.1
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.13	0.46	0.46	0.06	0.38	0.38
v/c Ratio	0.92	0.75	0.39	0.19	0.28	0.80	0.70	0.11	0.70	0.71	0.26
Control Delay	67.2	41.7	4.5	29.0	26.1	51.6	31.1	11.9	114.3	15.0	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	41.7	4.5	29.0	26.1	51.6	31.1	11.9	114.3	15.0	2.2
LOS	E	D	A	C	C	D	C	B	F	B	A
Approach Delay		40.3			26.5		32.2			18.0	
Approach LOS		D			C		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 29.2	Intersection LOS: C
Intersection Capacity Utilization 87.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	343	471	278	28	140	30	165	1544	76	68	1275	169
Future Volume (veh/h)	343	471	278	28	140	30	165	1544	76	68	1275	169
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	350	481	192	29	143	26	168	1576	58	69	1301	145
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	427	685	574	174	565	103	194	2109	657	85	1777	553
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.14	0.14	0.11	0.72	0.72
Sat Flow, veh/h	1167	1800	1508	734	1483	270	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	350	481	192	29	0	169	168	1576	58	69	1301	145
Grp Sat Flow(s),veh/h/ln	1167	1800	1508	734	0	1752	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	35.2	27.1	10.8	4.2	0.0	7.9	12.4	36.9	4.0	5.0	18.7	3.9
Cycle Q Clear(g_c), s	43.2	27.1	10.8	31.3	0.0	7.9	12.4	36.9	4.0	5.0	18.7	3.9
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	427	685	574	174	0	667	194	2109	657	85	1777	553
V/C Ratio(X)	0.82	0.70	0.33	0.17	0.00	0.25	0.86	0.75	0.09	0.81	0.73	0.26
Avail Cap(c_a), veh/h	430	690	578	176	0	672	250	2109	657	101	1777	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.68	0.68	0.68	0.82	0.82	0.82
Uniform Delay (d), s/veh	40.2	31.4	26.4	44.6	0.0	25.5	56.7	45.3	31.1	53.1	13.2	11.1
Incr Delay (d2), s/veh	11.8	3.2	0.3	0.4	0.0	0.2	13.1	1.7	0.2	24.1	2.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	14.1	4.6	0.9	0.0	3.9	6.3	17.1	1.7	2.8	8.6	1.8
LnGrp Delay(d),s/veh	52.1	34.6	26.7	45.1	0.0	25.7	69.8	46.9	31.3	77.2	15.4	12.1
LnGrp LOS	D	C	C	D		C	E	D	C	E	B	B
Approach Vol, veh/h		1023			198			1802			1515	
Approach Delay, s/veh		39.1			28.5			48.6			17.9	
Approach LOS		D			C			D			B	

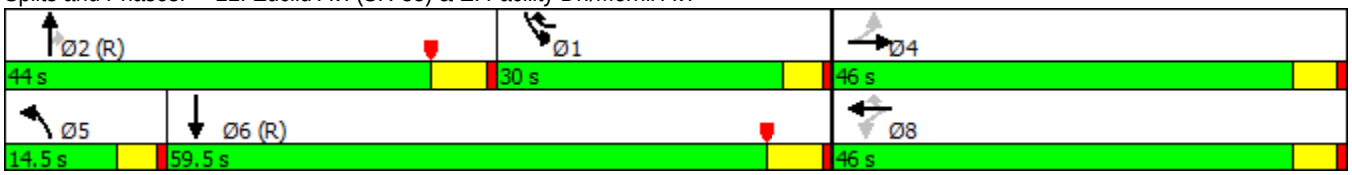
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	57.5		52.7	17.9	49.4		52.7
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	50.0		46.0	18.5	39.0		46.0
Max Q Clear Time (g_c+I1), s	7.0	38.9		45.2	14.4	20.7		33.3
Green Ext Time (p_c), s	0.0	10.0		0.5	0.1	15.7		4.9

Intersection Summary	
HCM 2010 Ctrl Delay	35.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	21	179	0	453	2	1404	343	682	1067
Future Volume (vph)	5	21	179	0	453	2	1404	343	682	1067
Turn Type	Perm	NA	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	1	5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	30.0	14.5	44.0	44.0	30.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	25.0%	12.1%	36.7%	36.7%	25.0%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		24.5		24.5	55.6	10.0	53.9	53.9	26.1	81.6
Actuated g/C Ratio		0.20		0.20	0.46	0.08	0.45	0.45	0.22	0.68
v/c Ratio		0.11		0.71	0.65	0.01	0.68	0.49	1.08	0.34
Control Delay		26.5		57.8	24.6	38.5	38.8	26.7	100.5	20.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		26.5		57.8	24.6	38.5	38.8	26.7	100.5	20.2
LOS		C		E	C	D	D	C	F	C
Approach Delay		26.5		34.0			36.4			51.5
Approach LOS		C		C			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 42.3	Intersection LOS: D
Intersection Capacity Utilization 81.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	11	179	0	453	2	1404	343	682	1067	1
Future Volume (veh/h)	5	21	11	179	0	453	2	1404	343	682	1067	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	23	4	192	0	459	2	1510	340	733	1147	1
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	35	134	19	172	0	1124	9	1556	478	1235	3635	3
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.32	0.32	0.39	0.72	0.72
Sat Flow, veh/h	0	393	56	329	0	1530	1619	4914	1509	3141	5071	4
Grp Volume(v), veh/h	32	0	0	192	0	459	2	1510	340	733	741	407
Grp Sat Flow(s),veh/h/ln	450	0	0	329	0	1530	1619	1638	1509	1570	1638	1799
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	36.4	23.8	22.2	9.9	9.9
Cycle Q Clear(g_c), s	41.0	0.0	0.0	41.0	0.0	0.0	0.1	36.4	23.8	22.2	9.9	9.9
Prop In Lane	0.16		0.12	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	188	0	0	172	0	1124	9	1556	478	1235	2349	1290
V/C Ratio(X)	0.17	0.00	0.00	1.11	0.00	0.41	0.23	0.97	0.71	0.59	0.32	0.32
Avail Cap(c_a), veh/h	188	0	0	172	0	1124	135	1556	478	1235	2349	1290
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	0.0	46.6	0.0	6.0	59.4	40.4	36.2	28.8	6.2	6.2
Incr Delay (d2), s/veh	0.2	0.0	0.0	102.5	0.0	0.1	3.3	12.9	5.9	0.5	0.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	10.6	0.0	5.8	0.1	18.2	10.7	9.7	4.5	5.1
LnGrp Delay(d),s/veh	30.5	0.0	0.0	149.1	0.0	6.1	62.7	53.4	42.1	29.4	6.6	6.9
LnGrp LOS	C			F		A	E	D	D	C	A	A
Approach Vol, veh/h		32			651			1852			1881	
Approach Delay, s/veh		30.5			48.3			51.3			15.5	
Approach LOS		C			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	53.7	44.0		46.0	5.1	92.6		46.0
Change Period (Y+Rc), s	6.0	* 6		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	25.5	* 38		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	24.2	38.4		43.0	2.1	11.9		43.0
Green Ext Time (p_c), s	0.4	0.0		0.0	0.0	9.9		0.0

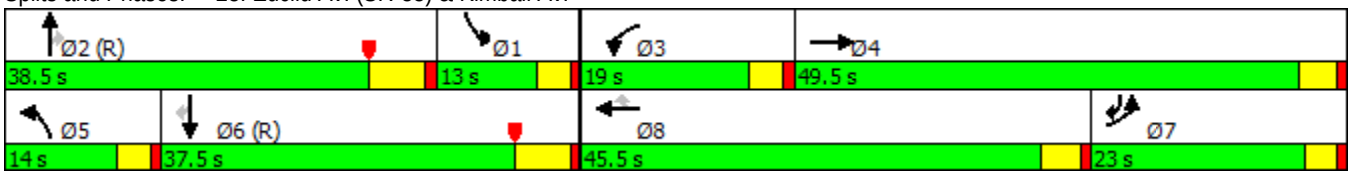
Intersection Summary	
HCM 2010 Ctrl Delay	35.5
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	619	785	206	335	276	124	800	154	242	868	198
Future Volume (vph)	619	785	206	335	276	124	800	154	242	868	198
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	45.5	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	23.0	49.5	19.0	45.5	45.5	14.0	38.5	38.5	13.0	37.5	23.0
Total Split (%)	19.2%	41.3%	15.8%	37.9%	37.9%	11.7%	32.1%	32.1%	10.8%	31.3%	19.2%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.5	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	35.9	41.3	15.8	21.2	21.2	13.0	30.4	30.4	14.0	31.4	69.3
Actuated g/C Ratio	0.30	0.34	0.13	0.18	0.18	0.11	0.25	0.25	0.12	0.26	0.58
v/c Ratio	0.69	0.77	1.01	0.58	0.72	0.74	0.67	0.32	0.69	0.70	0.21
Control Delay	43.4	40.1	117.4	47.9	29.3	71.5	22.5	2.7	53.4	37.0	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	40.1	117.4	47.9	29.3	71.5	22.5	2.7	53.4	37.0	5.8
LOS	D	D	F	D	C	E	C	A	D	D	A
Approach Delay		41.5		59.1			25.3			35.3	
Approach LOS		D		E			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 39.1	Intersection LOS: D
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	619	785	81	206	335	276	124	800	154	242	868	198
Future Volume (veh/h)	619	785	81	206	335	276	124	800	154	242	868	198
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	645	818	80	215	349	254	129	833	145	252	904	188
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	697	919	90	202	653	292	135	1005	313	652	1698	862
Arrive On Green	0.22	0.29	0.29	0.13	0.19	0.19	0.17	0.41	0.41	0.21	0.35	0.35
Sat Flow, veh/h	3141	3148	308	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	645	444	454	215	349	254	129	833	145	252	904	188
Grp Sat Flow(s),veh/h/ln	1570	1710	1746	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	24.1	29.8	29.8	15.0	11.0	19.3	9.5	18.2	6.1	8.3	17.7	2.0
Cycle Q Clear(g_c), s	24.1	29.8	29.8	15.0	11.0	19.3	9.5	18.2	6.1	8.3	17.7	2.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	697	499	510	202	653	292	135	1005	313	652	1698	862
V/C Ratio(X)	0.93	0.89	0.89	1.06	0.53	0.87	0.96	0.83	0.46	0.39	0.53	0.22
Avail Cap(c_a), veh/h	697	641	655	202	1169	523	135	1331	414	652	1698	862
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.43	0.43	0.43	1.00	1.00	1.00	0.75	0.75	0.75	0.95	0.95	0.95
Uniform Delay (d), s/veh	45.7	40.6	40.6	52.5	43.7	47.1	49.8	33.6	16.7	41.0	31.5	4.5
Incr Delay (d2), s/veh	9.2	5.8	5.7	80.7	0.3	3.1	54.0	6.1	3.7	0.1	1.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	14.9	15.2	11.2	5.3	8.4	6.3	8.7	2.8	3.6	8.2	1.7
LnGrp Delay(d),s/veh	54.9	46.4	46.3	133.2	44.0	50.2	103.8	39.7	20.4	41.1	32.6	5.1
LnGrp LOS	D	D	D	F	D	D	F	D	C	D	C	A
Approach Vol, veh/h		1543			818			1107			1344	
Approach Delay, s/veh		49.9			69.4			44.6			30.4	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.9	30.5	19.0	39.5	14.0	47.5	31.1	27.4
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.5	* 4.5
Max Green Setting (Gmax), s	9.0	* 33	15.0	45.0	10.0	31.5	19.0	* 41
Max Q Clear Time (g_c+I1), s	10.3	20.2	17.0	31.8	11.5	19.7	26.1	21.3
Green Ext Time (p_c), s	0.0	4.3	0.0	3.2	0.0	5.1	0.0	1.6

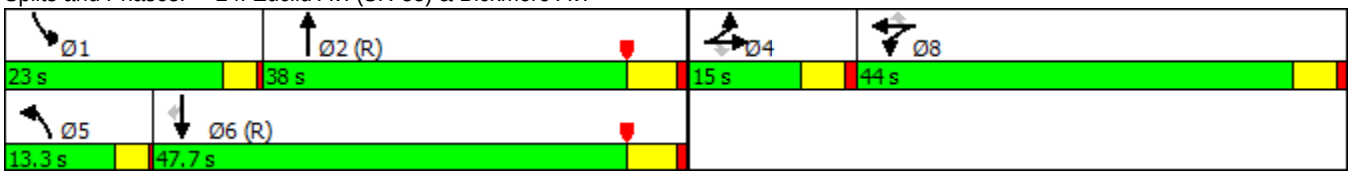
Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

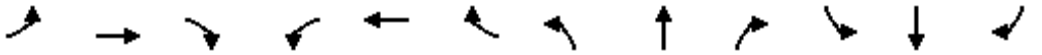
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	115	118	118	89	42	115	47	853	214	827	77
Future Volume (vph)	115	118	118	89	42	115	47	853	214	827	77
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	15.0	15.0	15.0	44.0	44.0	44.0	13.3	38.0	23.0	47.7	47.7
Total Split (%)	12.5%	12.5%	12.5%	36.7%	36.7%	36.7%	11.1%	31.7%	19.2%	39.8%	39.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	10.0	10.0	14.9	14.9	14.9	7.9	54.3	21.7	69.8	69.8
Actuated g/C Ratio	0.08	0.08	0.08	0.12	0.12	0.12	0.07	0.45	0.18	0.58	0.58
v/c Ratio	0.96	0.87	0.53	0.38	0.36	0.42	0.49	0.78	0.82	0.46	0.09
Control Delay	121.8	100.8	16.8	50.0	49.0	9.8	83.8	17.8	65.2	10.5	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.8	100.8	16.8	50.0	49.0	9.8	83.8	17.8	65.2	10.5	4.4
LOS	F	F	B	D	D	A	F	B	E	B	A
Approach Delay		79.5			30.9			20.6		20.5	
Approach LOS		E			C			C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 104 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 28.8	Intersection LOS: C
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	118	118	89	42	115	47	853	203	214	827	77
Future Volume (veh/h)	115	118	118	89	42	115	47	853	203	214	827	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	128	131	112	73	83	116	52	948	216	238	919	86
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	150	127	154	171	146	64	1380	314	263	2132	934
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.08	1.00	1.00	0.05	0.21	0.21
Sat Flow, veh/h	1619	1800	1530	1619	1800	1530	1619	2757	627	1619	3420	1498
Grp Volume(v), veh/h	128	131	112	73	83	116	52	587	577	238	919	86
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1619	1710	1674	1619	1710	1498
Q Serve(g_s), s	9.4	8.6	8.7	5.1	5.2	8.9	3.8	0.0	0.0	17.5	28.1	5.6
Cycle Q Clear(g_c), s	9.4	8.6	8.7	5.1	5.2	8.9	3.8	0.0	0.0	17.5	28.1	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	135	150	127	154	171	146	64	856	838	263	2132	934
V/C Ratio(X)	0.95	0.87	0.88	0.47	0.48	0.80	0.81	0.69	0.69	0.90	0.43	0.09
Avail Cap(c_a), veh/h	135	150	127	526	585	497	132	856	838	263	2132	934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.31	0.31	0.31	0.56	0.56	0.56
Uniform Delay (d), s/veh	54.7	54.4	54.4	51.4	51.5	53.1	54.8	0.0	0.0	55.9	29.1	20.2
Incr Delay (d2), s/veh	61.2	38.1	43.9	0.8	0.8	3.7	2.8	1.4	1.4	20.3	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	5.9	5.2	2.3	2.6	3.9	1.8	0.3	0.3	9.3	13.5	2.3
LnGrp Delay(d),s/veh	115.9	92.4	98.3	52.3	52.3	56.9	57.6	1.4	1.4	76.1	29.5	20.3
LnGrp LOS	F	F	F	D	D	E	E	A	A	E	C	C
Approach Vol, veh/h		371			272			1216			1243	
Approach Delay, s/veh		102.3			54.2			3.8			37.8	
Approach LOS		F			D			A			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	65.6		15.0	8.3	80.3		16.4
Change Period (Y+Rc), s	3.5	5.5		5.0	3.5	5.5		5.0
Max Green Setting (Gmax), s	19.5	32.5		10.0	9.8	42.2		39.0
Max Q Clear Time (g_c+I1), s	19.5	2.0		11.4	5.8	30.1		10.9
Green Ext Time (p_c), s	0.0	9.9		0.0	0.0	6.6		0.5

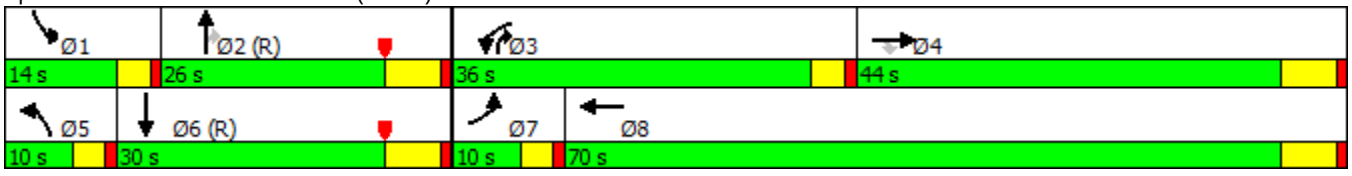
Intersection Summary	
HCM 2010 Ctrl Delay	33.6
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	339	29	475	77	34	978	1074	104	880
Future Volume (vph)	15	339	29	475	77	34	978	1074	104	880
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	10.0	44.0	44.0	36.0	70.0	10.0	26.0	36.0	14.0	30.0
Total Split (%)	8.3%	36.7%	36.7%	30.0%	58.3%	8.3%	21.7%	30.0%	11.7%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.5	29.4	29.4	32.0	61.4	6.4	27.0	65.0	11.6	35.9
Actuated g/C Ratio	0.05	0.24	0.24	0.27	0.51	0.05	0.22	0.54	0.10	0.30
v/c Ratio	0.20	0.79	0.06	0.62	0.16	0.41	0.91	1.17	0.69	0.63
Control Delay	61.5	55.1	0.2	42.8	10.0	68.3	43.4	98.2	68.7	48.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	55.1	0.2	42.8	10.0	68.3	43.4	98.2	68.7	48.4
LOS	E	E	A	D	A	E	D	F	E	D
Approach Delay		51.2			35.5		72.0			50.5
Approach LOS		D			D		E			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 59.3	Intersection LOS: E
Intersection Capacity Utilization 107.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	339	29	475	77	59	34	978	1074	104	880	15
Future Volume (veh/h)	15	339	29	475	77	59	34	978	1074	104	880	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	349	0	490	79	55	35	1008	674	107	907	11
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	410	348	546	392	273	46	1674	804	130	1962	24
Arrive On Green	0.02	0.23	0.00	0.18	0.40	0.40	0.03	0.34	0.34	0.03	0.13	0.13
Sat Flow, veh/h	1619	1800	1530	2956	990	689	1619	4914	1530	1619	5003	61
Grp Volume(v), veh/h	15	349	0	490	0	134	35	1008	674	107	594	324
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1678	1619	1638	1530	1619	1638	1788
Q Serve(g_s), s	1.1	22.3	0.0	19.4	0.0	6.3	2.6	20.4	40.9	7.9	20.1	20.2
Cycle Q Clear(g_c), s	1.1	22.3	0.0	19.4	0.0	6.3	2.6	20.4	40.9	7.9	20.1	20.2
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	27	410	348	546	0	665	46	1674	804	130	1285	701
V/C Ratio(X)	0.57	0.85	0.00	0.90	0.00	0.20	0.75	0.60	0.84	0.82	0.46	0.46
Avail Cap(c_a), veh/h	81	570	484	788	0	895	81	1674	804	135	1285	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.94	0.94	0.94
Uniform Delay (d), s/veh	58.6	44.4	0.0	47.8	0.0	23.8	57.9	32.8	24.2	57.6	40.5	40.5
Incr Delay (d2), s/veh	6.8	10.1	0.0	7.5	0.0	0.2	0.8	0.1	1.0	28.0	1.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.2	0.0	8.5	0.0	2.9	1.2	9.3	19.1	4.6	9.4	10.4
LnGrp Delay(d),s/veh	65.4	54.5	0.0	55.3	0.0	24.0	58.7	33.0	25.2	85.6	41.6	42.6
LnGrp LOS	E	D		E		C	E	C	C	F	D	D
Approach Vol, veh/h		364			624			1717			1025	
Approach Delay, s/veh		55.0			48.6			30.4			46.5	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	46.9	26.2	33.3	7.4	53.1	6.0	53.5
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	20.0	32.0	38.0	6.0	24.0	6.0	64.0
Max Q Clear Time (g_c+I1), s	9.9	42.9	21.4	24.3	4.6	22.2	3.1	8.3
Green Ext Time (p_c), s	0.0	0.0	0.7	3.0	0.0	1.5	0.0	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	40.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	266	662	14	410	25	6	74	17
Future Volume (vph)	266	662	14	410	25	6	74	17
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	37.4	9.6	24.0	33.0	33.0	33.0	33.0
Total Split (%)	28.8%	46.8%	12.0%	30.0%	41.3%	41.3%	41.3%	41.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	15.9	34.7	5.1	15.8		25.8		25.8
Actuated g/C Ratio	0.22	0.47	0.07	0.22		0.35		0.35
v/c Ratio	0.81	0.47	0.13	0.74		0.10		0.89
Control Delay	47.7	15.2	38.4	34.8		17.9		45.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	47.7	15.2	38.4	34.8		17.9		45.2
LOS	D	B	D	C		B		D
Approach Delay		24.1		34.9		17.9		45.2
Approach LOS		C		C		B		D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 73.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 31.5	Intersection LOS: C
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	662	46	14	410	89	25	6	9	74	17	346
Future Volume (veh/h)	266	662	46	14	410	89	25	6	9	74	17	346
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	283	704	49	15	436	95	27	6	10	79	18	368
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	325	1320	92	29	630	136	245	58	66	129	43	414
Arrive On Green	0.20	0.41	0.41	0.02	0.23	0.23	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1619	3237	225	1619	2798	605	456	168	189	191	123	1193
Grp Volume(v), veh/h	283	372	381	15	265	266	43	0	0	465	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1752	1619	1710	1693	814	0	0	1508	0	0
Q Serve(g_s), s	11.5	11.1	11.1	0.6	9.6	9.8	0.0	0.0	0.0	13.9	0.0	0.0
Cycle Q Clear(g_c), s	11.5	11.1	11.1	0.6	9.6	9.8	1.1	0.0	0.0	19.7	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.36	0.63		0.23	0.17		0.79
Lane Grp Cap(c), veh/h	325	697	714	29	385	381	369	0	0	585	0	0
V/C Ratio(X)	0.87	0.53	0.53	0.51	0.69	0.70	0.12	0.00	0.00	0.80	0.00	0.00
Avail Cap(c_a), veh/h	441	789	808	120	450	446	455	0	0	694	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.2	15.2	15.2	32.9	24.0	24.1	14.8	0.0	0.0	20.8	0.0	0.0
Incr Delay (d2), s/veh	10.8	0.6	0.6	5.0	3.6	3.9	0.1	0.0	0.0	5.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	5.3	5.4	0.3	4.9	5.0	0.6	0.0	0.0	9.0	0.0	0.0
LnGrp Delay(d),s/veh	37.0	15.8	15.8	37.9	27.6	28.0	14.9	0.0	0.0	26.2	0.0	0.0
LnGrp LOS	D	B	B	D	C	C	B			C		
Approach Vol, veh/h		1036			546			43			465	
Approach Delay, s/veh		21.6			28.1			14.9			26.2	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	33.8		28.0	18.2	21.4		28.0
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	31.2		28.4	18.4	17.8		28.4
Max Q Clear Time (g_c+I1), s	2.6	13.1		21.7	13.5	11.8		3.1
Green Ext Time (p_c), s	0.0	6.8		1.8	0.2	3.4		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	24.2
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	339	361	190	154	322	201
Future Volume (vph)	339	361	190	154	322	201
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	14.0	46.8	32.8	32.8
Total Split (%)	41.5%	41.5%	17.5%	58.5%	41.0%	41.0%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	18.6	16.9	9.8	32.0	17.5	17.5
Actuated g/C Ratio	0.30	0.28	0.16	0.52	0.29	0.29
v/c Ratio	0.75	0.56	0.79	0.18	0.68	0.37
Control Delay	30.5	5.8	54.9	9.4	27.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	5.8	54.9	9.4	27.4	5.1
LOS	C	A	D	A	C	A
Approach Delay				34.5	18.8	
Approach LOS				C	B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 61.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	0	361	0	0	0	190	154	0	0	322	201
Future Volume (veh/h)	339	0	361	0	0	0	190	154	0	0	322	201
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	365	0	388				204	166	0	0	346	216
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	480	0	454				247	916	0	0	486	403
Arrive On Green	0.30	0.00	0.30				0.15	0.51	0.00	0.00	0.27	0.27
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1493
Grp Volume(v), veh/h	365	0	388				204	166	0	0	346	216
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1493
Q Serve(g_s), s	10.9	0.0	12.8				6.5	2.7	0.0	0.0	9.3	6.6
Cycle Q Clear(g_c), s	10.9	0.0	12.8				6.5	2.7	0.0	0.0	9.3	6.6
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	480	0	454				247	916	0	0	486	403
V/C Ratio(X)	0.76	0.00	0.86				0.83	0.18	0.00	0.00	0.71	0.54
Avail Cap(c_a), veh/h	868	0	820				285	1383	0	0	911	755
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	17.7				21.9	7.1	0.0	0.0	17.6	16.6
Incr Delay (d2), s/veh	0.9	0.0	1.8				14.1	0.1	0.0	0.0	1.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.0	10.0				3.9	1.3	0.0	0.0	4.9	5.6
LnGrp Delay(d),s/veh	18.0	0.0	19.5				36.0	7.2	0.0	0.0	19.5	17.7
LnGrp LOS	B		B				D	A			B	B
Approach Vol, veh/h		753						370			562	
Approach Delay, s/veh		18.8						23.1			18.8	
Approach LOS		B						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		33.0		20.4	12.7	20.2		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		41.0		28.6	9.4	27.0		
Max Q Clear Time (g_c+I1), s		4.7		14.8	8.5	11.3		
Green Ext Time (p_c), s		3.7		1.1	0.0	3.1		

Intersection Summary	
HCM 2010 Ctrl Delay	19.7
HCM 2010 LOS	B

APPENDIX 6.12:

OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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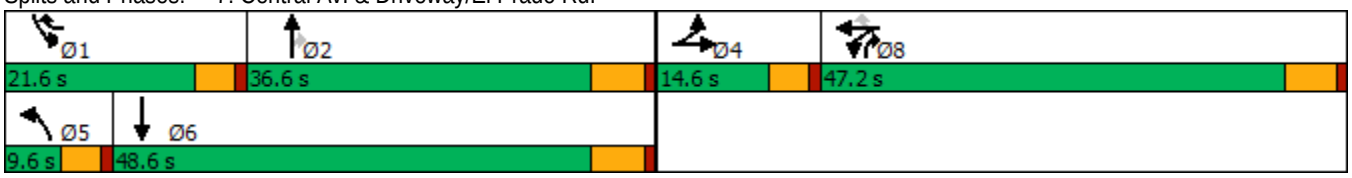
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1034	3	506	2	767	707	411	627
Future Volume (vph)	1	1	1034	3	506	2	767	707	411	627
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	47.2	47.2	21.6	9.6	36.6	47.2	21.6	48.6
Total Split (%)	12.2%	12.2%	39.3%	39.3%	18.0%	8.0%	30.5%	39.3%	18.0%	40.5%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	41.5	41.5	64.4	5.0	30.9	72.4	17.0	50.8
Actuated g/C Ratio	0.09	0.09	0.38	0.38	0.59	0.05	0.29	0.67	0.16	0.47
v/c Ratio	0.01	0.01	0.98	0.93	0.55	0.03	0.87	0.67	0.93	0.31
Control Delay	48.0	41.0	66.2	55.1	9.1	53.0	48.6	5.5	72.0	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	66.2	55.1	9.1	53.0	48.6	5.5	72.0	19.5
LOS	D	D	E	E	A	D	D	A	E	B
Approach Delay		43.3		43.8			27.9			40.1
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 37.1	Intersection LOS: D
Intersection Capacity Utilization 87.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1034	3	506	2	767	707	411	627	9
Future Volume (veh/h)	1	1	1	1034	3	506	2	767	707	411	627	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1151	0	419	2	852	617	457	697	8
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1203	0	804	4	953	989	483	2152	25
Arrive On Green	0.01	0.01	0.01	0.37	0.00	0.37	0.00	0.28	0.28	0.15	0.43	0.43
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	3141	5008	57
Grp Volume(v), veh/h	1	0	2	1151	0	419	2	852	617	457	456	249
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1570	1638	1790
Q Serve(g_s), s	0.1	0.0	0.1	38.3	0.0	19.8	0.1	26.5	26.7	15.9	10.2	10.2
Cycle Q Clear(g_c), s	0.1	0.0	0.1	38.3	0.0	19.8	0.1	26.5	26.7	15.9	10.2	10.2
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1203	0	804	4	953	989	483	1408	769
V/C Ratio(X)	0.08	0.00	0.15	0.96	0.00	0.52	0.46	0.89	0.62	0.95	0.32	0.32
Avail Cap(c_a), veh/h	146	0	150	1213	0	808	73	953	989	483	1408	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	0.0	54.5	33.9	0.0	17.2	55.0	38.3	11.4	46.3	20.9	20.9
Incr Delay (d2), s/veh	0.9	0.0	2.0	16.5	0.0	0.6	25.4	12.6	3.0	27.6	0.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	19.9	0.0	8.5	0.1	14.1	19.5	8.8	4.7	5.3
LnGrp Delay(d),s/veh	55.4	0.0	56.4	50.4	0.0	17.8	80.4	50.9	14.4	73.9	21.5	22.0
LnGrp LOS	E		E	D		B	F	D	B	E	C	C
Approach Vol, veh/h		3			1570			1471			1162	
Approach Delay, s/veh		56.1			41.7			35.6			42.2	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.6	36.6		5.5	4.9	53.3		46.9
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	17.0	30.8		10.0	5.0	42.8		41.4
Max Q Clear Time (g_c+I1), s	17.9	28.7		2.1	2.1	12.2		40.3
Green Ext Time (p_c), s	0.0	1.7		0.0	0.0	6.4		0.7

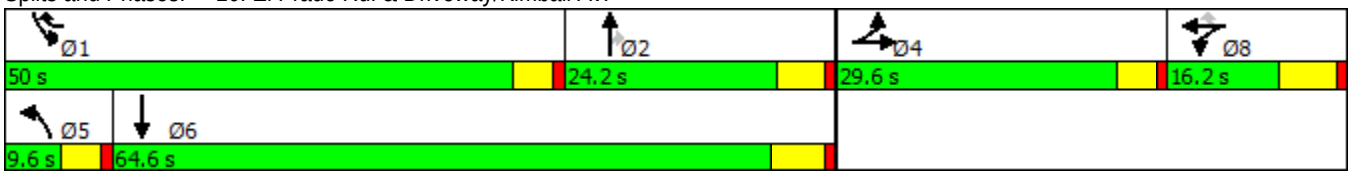
Intersection Summary	
HCM 2010 Ctrl Delay	39.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	1	26	1263	5	282	32	771	205
Future Volume (vph)	11	1	26	1263	5	282	32	771	205
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	50.0	9.6	24.2	24.2	50.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	41.7%	8.0%	20.2%	20.2%	41.7%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	59.0	5.1	19.5	19.5	46.6	60.4
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.63
v/c Ratio	0.05	0.01	0.30	1.09	0.06	0.79	0.08	0.52	0.23
Control Delay	40.1	30.3	49.9	66.9	52.6	56.2	0.3	21.7	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.3	49.9	66.9	52.6	56.2	0.3	21.7	11.3
LOS	D	C	D	E	D	E	A	C	B
Approach Delay		38.0	66.2			50.5			19.2
Approach LOS		D	E			D			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 46.2	Intersection LOS: D
Intersection Capacity Utilization 118.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	2	28	26	1263	5	282	32	771	205	43
Future Volume (veh/h)	11	1	2	28	26	1263	5	282	32	771	205	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	11	1	1	29	27	428	5	288	33	787	209	44
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	52	27	27	137	127	674	122	374	318	911	609	128
Arrive On Green	0.03	0.03	0.03	0.15	0.15	0.15	0.08	0.21	0.21	0.29	0.42	0.42
Sat Flow, veh/h	1619	827	827	909	846	1530	1619	1800	1530	3141	1442	304
Grp Volume(v), veh/h	11	0	2	56	0	428	5	288	33	787	0	253
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1570	0	1746
Q Serve(g_s), s	0.4	0.0	0.1	1.9	0.0	10.0	0.2	10.0	1.2	15.8	0.0	6.5
Cycle Q Clear(g_c), s	0.4	0.0	0.1	1.9	0.0	10.0	0.2	10.0	1.2	15.8	0.0	6.5
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	52	0	53	264	0	674	122	374	318	911	0	737
V/C Ratio(X)	0.21	0.00	0.04	0.21	0.00	0.63	0.04	0.77	0.10	0.86	0.00	0.34
Avail Cap(c_a), veh/h	610	0	623	264	0	674	122	515	438	2149	0	1547
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.3	0.0	31.1	24.7	0.0	14.4	28.5	24.8	21.3	22.3	0.0	12.9
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.4	0.0	2.0	0.1	4.8	0.1	1.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	0.9	0.0	6.4	0.1	5.5	0.5	6.9	0.0	3.1
LnGrp Delay(d),s/veh	33.3	0.0	31.4	25.1	0.0	16.4	28.5	29.6	21.4	23.3	0.0	13.2
LnGrp LOS	C		C	C		B	C	C	C	C		B
Approach Vol, veh/h		13			484			326			1040	
Approach Delay, s/veh		33.0			17.4			28.7			20.9	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.8	19.6		6.7	9.6	33.8		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	45.4	* 19		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	17.8	12.0		2.4	2.2	8.5		12.0
Green Ext Time (p_c), s	1.5	1.8		0.0	0.0	3.4		0.0

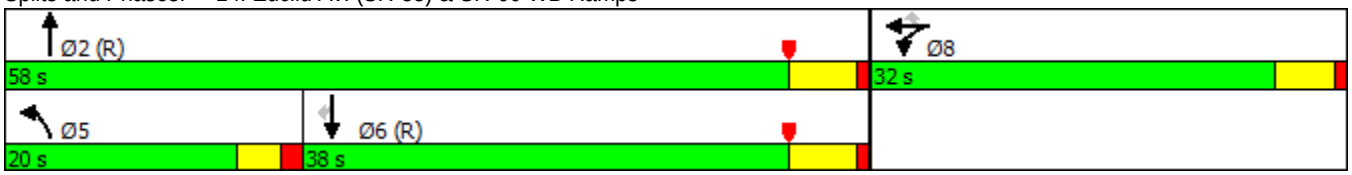
Intersection Summary	
HCM 2010 Ctrl Delay	21.4
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	752	2	378	457	964	1037	480
Future Volume (vph)	752	2	378	457	964	1037	480
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	32.0	32.0	32.0	20.0	58.0	38.0	38.0
Total Split (%)	35.6%	35.6%	35.6%	22.2%	64.4%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	26.5	26.5	26.5	15.4	53.0	33.1	33.1
Actuated g/C Ratio	0.29	0.29	0.29	0.17	0.59	0.37	0.37
v/c Ratio	0.95	0.92	0.73	0.92	0.52	0.89	0.59
Control Delay	64.3	58.3	30.4	42.2	17.4	37.1	5.1
Queue Delay	46.9	49.3	0.0	0.0	0.6	0.0	0.0
Total Delay	111.2	107.6	30.4	42.2	18.0	37.1	5.1
LOS	F	F	C	D	B	D	A
Approach Delay		85.7			25.8	27.0	
Approach LOS		F			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 50 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 42.9	Intersection LOS: D
Intersection Capacity Utilization 135.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	752	2	378	457	964	0	0	1037	480
Future Volume (veh/h)	0	0	0	752	2	378	457	964	0	0	1037	480
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				888	0	168	491	1037	0	0	1115	516
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				949	0	448	541	2019	0	0	1259	551
Arrive On Green				0.29	0.00	0.29	0.06	0.19	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1530	3141	3510	0	0	3510	1496
Grp Volume(v), veh/h				888	0	168	491	1037	0	0	1115	516
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1570	1710	0	0	1710	1496
Q Serve(g_s), s				24.0	0.0	7.8	14.0	24.4	0.0	0.0	27.5	29.9
Cycle Q Clear(g_c), s				24.0	0.0	7.8	14.0	24.4	0.0	0.0	27.5	29.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				949	0	448	541	2019	0	0	1259	551
V/C Ratio(X)				0.94	0.00	0.37	0.91	0.51	0.00	0.00	0.89	0.94
Avail Cap(c_a), veh/h				971	0	459	541	2019	0	0	1259	551
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.48	0.48	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.0	0.0	25.3	41.7	24.7	0.0	0.0	26.7	27.4
Incr Delay (d2), s/veh				15.2	0.0	0.2	10.4	0.4	0.0	0.0	9.4	25.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.7	0.0	3.3	6.9	11.7	0.0	0.0	14.5	16.2
LnGrp Delay(d),s/veh				46.2	0.0	25.5	52.1	25.1	0.0	0.0	36.0	53.0
LnGrp LOS				D		C	D	C			D	D
Approach Vol, veh/h					1056			1528			1631	
Approach Delay, s/veh					42.9			33.8			41.4	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.6			20.0	38.6		31.4
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		52.5			15.5	32.5		27.0
Max Q Clear Time (g_c+I1), s		26.4			16.0	31.9		26.0
Green Ext Time (p_c), s		22.9			0.0	0.6		0.3

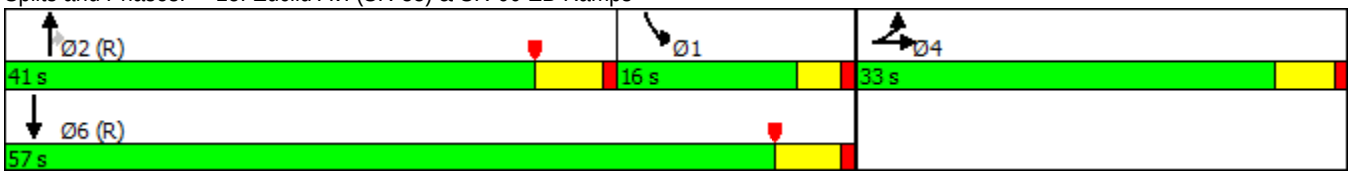
Intersection Summary	
HCM 2010 Ctrl Delay	39.0
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	337	0	1084	643	299	1490
Future Volume (vph)	337	0	1084	643	299	1490
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	33.0	33.0	41.0	41.0	16.0	57.0
Total Split (%)	36.7%	36.7%	45.6%	45.6%	17.8%	63.3%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lead	Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	28.5	28.5	35.5	35.5	11.5	51.0
Actuated g/C Ratio	0.32	0.32	0.39	0.39	0.13	0.57
v/c Ratio	0.67	1.33	0.85	0.68	0.79	0.82
Control Delay	34.8	185.8	32.7	5.6	52.4	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	48.0
Total Delay	34.8	185.8	32.7	5.6	52.4	70.8
LOS	C	F	C	A	D	E
Approach Delay		138.2	22.6			67.7
Approach LOS		F	C			E

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 65.5	Intersection LOS: E
Intersection Capacity Utilization 135.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	337	0	625	0	0	0	0	1084	643	299	1490	0
Future Volume (veh/h)	337	0	625	0	0	0	0	1084	643	299	1490	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	359	0	582				0	1153	684	318	1585	0
Adj No. of Lanes	1	1	0				0	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	504	0	476				0	1349	602	675	2293	0
Arrive On Green	0.31	0.00	0.31				0.00	0.39	0.39	0.21	0.67	0.00
Sat Flow, veh/h	1619	0	1530				0	3510	1525	3141	3510	0
Grp Volume(v), veh/h	359	0	582				0	1153	684	318	1585	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1525	1570	1710	0
Q Serve(g_s), s	17.7	0.0	28.0				0.0	27.7	35.5	8.0	25.6	0.0
Cycle Q Clear(g_c), s	17.7	0.0	28.0				0.0	27.7	35.5	8.0	25.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	504	0	476				0	1349	602	675	2293	0
V/C Ratio(X)	0.71	0.00	1.22				0.00	0.85	1.14	0.47	0.69	0.00
Avail Cap(c_a), veh/h	504	0	476				0	1349	602	675	2293	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.72	0.72	0.31	0.31	0.00
Uniform Delay (d), s/veh	27.4	0.0	31.0				0.0	24.9	27.2	30.9	9.1	0.0
Incr Delay (d2), s/veh	4.1	0.0	117.9				0.0	5.3	76.1	0.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	0.0	27.4				0.0	14.0	27.6	3.5	12.1	0.0
LnGrp Delay(d),s/veh	31.5	0.0	148.9				0.0	30.1	103.4	30.9	9.6	0.0
LnGrp LOS	C		F					C	F	C	A	
Approach Vol, veh/h		941						1837			1903	
Approach Delay, s/veh		104.1						57.4			13.2	
Approach LOS		F						E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.0	41.0		33.0		66.0		
Change Period (Y+Rc), s	5.5	* 5.5		5.0		5.5		
Max Green Setting (Gmax), s	12.0	* 36		28.0		51.5		
Max Q Clear Time (g_c+I1), s	10.0	37.5		30.0		27.6		
Green Ext Time (p_c), s	0.7	0.0		0.0		17.0		

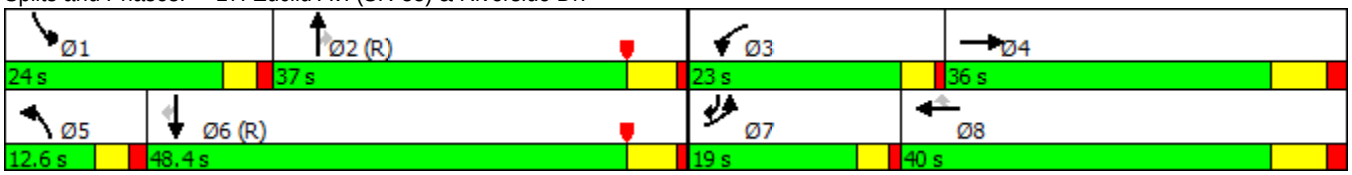
Intersection Summary	
HCM 2010 Ctrl Delay	48.8
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	330	177	388	51	63	974	172	182	1086	150
Future Volume (vph)	145	330	177	388	51	63	974	172	182	1086	150
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	19.0	36.0	23.0	40.0	40.0	12.6	37.0	37.0	24.0	48.4	19.0
Total Split (%)	15.8%	30.0%	19.2%	33.3%	33.3%	10.5%	30.8%	30.8%	20.0%	40.3%	15.8%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.9	21.1	16.8	24.0	24.0	9.2	42.7	42.7	18.4	54.1	73.5
Actuated g/C Ratio	0.12	0.18	0.14	0.20	0.20	0.08	0.36	0.36	0.15	0.45	0.61
v/c Ratio	0.82	0.67	0.83	0.60	0.13	0.54	0.59	0.27	0.78	0.52	0.16
Control Delay	83.7	49.8	77.9	46.5	0.6	60.3	30.5	11.4	48.6	17.4	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.7	49.8	77.9	46.5	0.6	60.3	30.5	11.4	48.6	17.4	6.6
LOS	F	D	E	D	A	E	C	B	D	B	A
Approach Delay		59.1		51.7			29.3			20.3	
Approach LOS		E		D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 68 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 33.8	Intersection LOS: C
Intersection Capacity Utilization 71.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	330	54	177	388	51	63	974	172	182	1086	150
Future Volume (veh/h)	145	330	54	177	388	51	63	974	172	182	1086	150
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	153	347	34	186	408	49	66	1025	100	192	1143	92
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	177	529	52	210	647	289	83	1922	598	220	2337	895
Arrive On Green	0.11	0.17	0.17	0.13	0.19	0.19	0.02	0.13	0.13	0.04	0.16	0.16
Sat Flow, veh/h	1619	3144	306	1619	3420	1528	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	153	188	193	186	408	49	66	1025	100	192	1143	92
Grp Sat Flow(s),veh/h/ln	1619	1710	1740	1619	1710	1528	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	11.2	12.3	12.5	13.6	13.2	3.2	4.9	23.4	7.0	14.1	25.5	4.9
Cycle Q Clear(g_c), s	11.2	12.3	12.5	13.6	13.2	3.2	4.9	23.4	7.0	14.1	25.5	4.9
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	288	293	210	647	289	83	1922	598	220	2337	895
V/C Ratio(X)	0.87	0.65	0.66	0.88	0.63	0.17	0.80	0.53	0.17	0.87	0.49	0.10
Avail Cap(c_a), veh/h	202	413	421	256	941	420	109	1922	598	263	2337	895
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.69	0.69	0.69	0.58	0.58	0.58
Uniform Delay (d), s/veh	52.6	46.6	46.7	51.3	44.8	40.8	58.4	42.0	34.9	56.3	37.3	18.3
Incr Delay (d2), s/veh	25.4	3.5	3.6	22.5	1.5	0.4	18.7	0.7	0.4	15.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	6.1	6.3	7.4	6.4	1.4	2.6	10.8	3.0	7.3	11.7	2.1
LnGrp Delay(d),s/veh	77.9	50.1	50.3	73.8	46.3	41.2	77.1	42.8	35.3	71.3	37.7	18.4
LnGrp LOS	E	D	D	E	D	D	E	D	D	E	D	B
Approach Vol, veh/h		534			643			1191			1427	
Approach Delay, s/veh		58.2			53.8			44.0			41.0	
Approach LOS		E			D			D			D	

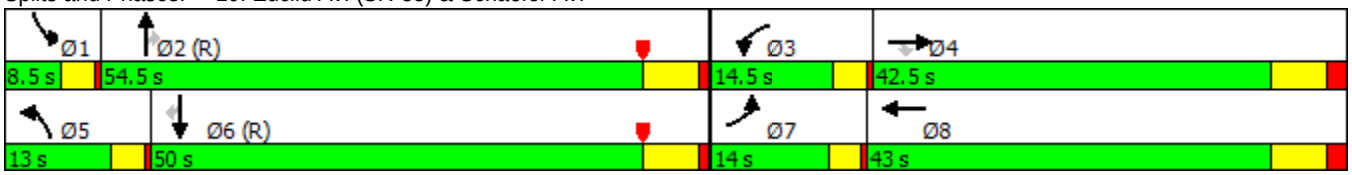
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.8	52.4	19.6	27.2	10.6	62.6	17.1	29.7
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	19.5	31.5	19.0	29.0	8.1	42.9	15.0	33.0
Max Q Clear Time (g_c+I1), s	16.1	25.4	15.6	14.5	6.9	27.5	13.2	15.2
Green Ext Time (p_c), s	0.2	5.2	0.1	5.5	0.0	11.6	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	61	117	57	119	119	1421	21	15	1634	132
Future Volume (vph)	139	61	117	57	119	119	1421	21	15	1634	132
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	42.5	42.5	14.5	43.0	13.0	54.5	54.5	8.5	50.0	50.0
Total Split (%)	11.7%	35.4%	35.4%	12.1%	35.8%	10.8%	45.4%	45.4%	7.1%	41.7%	41.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.7	21.6	21.6	10.3	17.6	14.5	70.6	70.6	5.4	56.2	56.2
Actuated g/C Ratio	0.10	0.18	0.18	0.09	0.15	0.12	0.59	0.59	0.04	0.47	0.47
v/c Ratio	0.94	0.20	0.33	0.44	0.55	0.65	0.52	0.02	0.22	0.75	0.18
Control Delay	113.2	42.8	8.6	62.6	51.3	42.1	21.2	2.4	84.5	11.4	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.2	42.8	8.6	62.6	51.3	42.1	21.2	2.4	84.5	11.4	0.7
LOS	F	D	A	E	D	D	C	A	F	B	A
Approach Delay		61.1			54.7		22.6			11.2	
Approach LOS		E			D		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 74.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	61	117	57	119	17	119	1421	21	15	1634	132
Future Volume (veh/h)	139	61	117	57	119	17	119	1421	21	15	1634	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	148	65	72	61	127	16	127	1512	17	16	1738	92
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	142	214	182	117	163	20	128	3071	956	28	2767	841
Arrive On Green	0.09	0.12	0.12	0.07	0.10	0.10	0.03	0.21	0.21	0.01	0.38	0.38
Sat Flow, veh/h	1619	1800	1530	1619	1568	197	1619	4914	1530	1619	4914	1494
Grp Volume(v), veh/h	148	65	72	61	0	143	127	1512	17	16	1738	92
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1765	1619	1638	1530	1619	1638	1494
Q Serve(g_s), s	10.5	4.0	5.2	4.4	0.0	9.5	9.4	32.6	1.1	1.2	34.6	4.8
Cycle Q Clear(g_c), s	10.5	4.0	5.2	4.4	0.0	9.5	9.4	32.6	1.1	1.2	34.6	4.8
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	142	214	182	117	0	183	128	3071	956	28	2767	841
V/C Ratio(X)	1.04	0.30	0.40	0.52	0.00	0.78	0.99	0.49	0.02	0.57	0.63	0.11
Avail Cap(c_a), veh/h	142	533	453	148	0	530	128	3071	956	67	2767	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.67	0.67	0.67	0.38	0.38	0.38
Uniform Delay (d), s/veh	54.8	48.3	48.9	53.6	0.0	52.5	58.4	30.8	18.3	58.9	27.1	17.8
Incr Delay (d2), s/veh	88.0	0.6	1.0	1.3	0.0	5.3	62.4	0.4	0.0	2.6	0.4	0.1
Initial Q Delay(d3),s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	2.0	2.3	2.0	0.0	4.9	6.4	14.9	0.5	0.6	15.8	2.0
LnGrp Delay(d),s/veh	143.0	48.9	49.9	55.0	0.0	57.8	120.8	31.2	18.3	61.5	27.5	17.9
LnGrp LOS	F	D	D	D		E	F	C	B	E	C	B
Approach Vol, veh/h		285			204			1656			1846	
Approach Delay, s/veh		98.0			57.0			37.9			27.4	
Approach LOS		F			E			D			C	

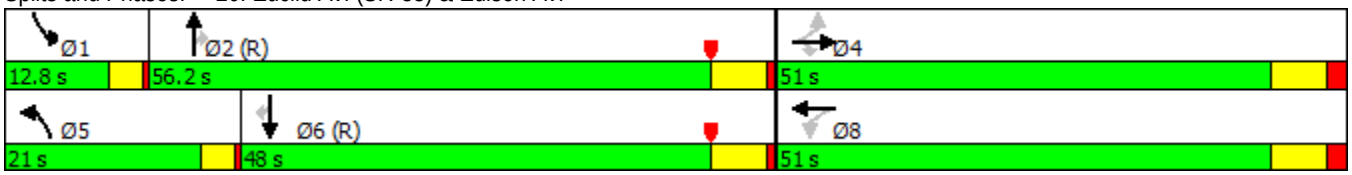
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	81.0	12.2	21.2	13.0	73.6	14.0	19.4
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	48.5	11.0	35.5	9.5	44.0	10.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	34.6	6.4	7.2	11.4	36.6	12.5	11.5
Green Ext Time (p_c), s	0.0	12.8	0.0	1.0	0.0	7.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	214	166	227	67	342	247	1273	36	41	1479	247
Future Volume (vph)	214	166	227	67	342	247	1273	36	41	1479	247
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	21.0	56.2	56.2	12.8	48.0	48.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	17.5%	46.8%	46.8%	10.7%	40.0%	40.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.1	44.1	44.1	44.1	44.1	17.5	53.6	53.6	7.5	41.9	41.9
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.15	0.45	0.45	0.06	0.35	0.35
v/c Ratio	1.07	0.27	0.34	0.18	0.62	1.12	0.62	0.05	0.44	0.92	0.41
Control Delay	117.2	28.1	4.6	27.4	35.7	131.5	17.5	1.4	79.6	32.1	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	117.2	28.1	4.6	27.4	35.7	131.5	17.5	1.4	79.6	32.1	9.7
LOS	F	C	A	C	D	F	B	A	E	C	A
Approach Delay		50.8			34.5		35.2			30.1	
Approach LOS		D			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 100.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	214	166	227	67	342	39	247	1273	36	41	1479	247
Future Volume (veh/h)	214	166	227	67	342	39	247	1273	36	41	1479	247
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	228	177	174	71	364	39	263	1354	23	44	1573	232
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	229	660	561	354	586	63	236	2271	707	54	1720	535
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.29	0.92	0.92	0.03	0.35	0.35
Sat Flow, veh/h	942	1800	1530	988	1598	171	1619	4914	1530	1619	4914	1528
Grp Volume(v), veh/h	228	177	174	71	0	403	263	1354	23	44	1573	232
Grp Sat Flow(s),veh/h/ln	942	1800	1530	988	0	1770	1619	1638	1530	1619	1638	1528
Q Serve(g_s), s	21.6	8.3	9.8	6.5	0.0	22.4	17.5	5.6	0.1	3.2	36.7	14.0
Cycle Q Clear(g_c), s	44.0	8.3	9.8	14.8	0.0	22.4	17.5	5.6	0.1	3.2	36.7	14.0
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	229	660	561	354	0	649	236	2271	707	54	1720	535
V/C Ratio(X)	0.99	0.27	0.31	0.20	0.00	0.62	1.11	0.60	0.03	0.81	0.91	0.43
Avail Cap(c_a), veh/h	229	660	561	354	0	649	236	2271	707	125	1720	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	0.63	0.63	0.63
Uniform Delay (d), s/veh	52.0	26.7	27.2	31.9	0.0	31.2	42.5	2.7	2.4	57.6	37.3	29.9
Incr Delay (d2), s/veh	57.5	0.2	0.3	0.3	0.0	1.8	85.2	0.9	0.1	6.5	6.1	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	4.2	4.2	1.8	0.0	11.3	13.3	2.2	0.1	1.6	17.6	6.1
LnGrp Delay(d),s/veh	109.5	26.9	27.5	32.2	0.0	33.0	127.7	3.5	2.5	64.1	43.3	31.5
LnGrp LOS	F	C	C	C		C	F	A	A	E	D	C
Approach Vol, veh/h		579			474			1640			1849	
Approach Delay, s/veh		59.6			32.9			23.4			42.4	
Approach LOS		E			C			C			D	

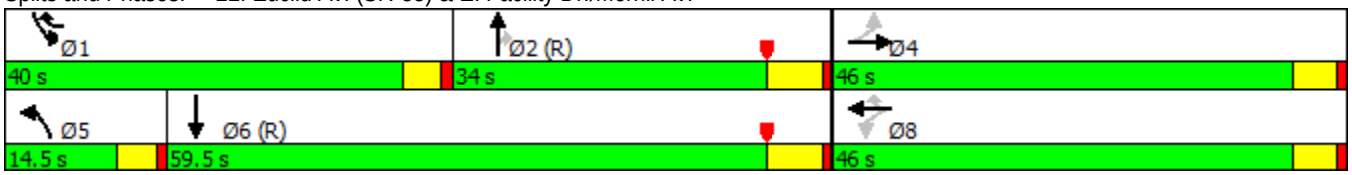
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	61.5		51.0	21.0	48.0		51.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.3	50.2		44.0	17.5	42.0		44.0
Max Q Clear Time (g_c+I1), s	5.2	7.6		46.0	19.5	38.7		24.4
Green Ext Time (p_c), s	0.0	32.1		0.0	0.0	3.1		5.3

Intersection Summary		
HCM 2010 Ctrl Delay		36.7
HCM 2010 LOS		D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	8	6	379	47	606	19	1046	179	475	1463
Future Volume (vph)	8	6	379	47	606	19	1046	179	475	1463
Turn Type	Perm	NA	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	1	5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	40.0	14.5	34.0	34.0	40.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	33.3%	12.1%	28.3%	28.3%	33.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	77.0	10.0	28.0	28.0	35.5	62.2
Actuated g/C Ratio		0.34		0.34	0.64	0.08	0.23	0.23	0.30	0.52
v/c Ratio		0.04		0.98	0.64	0.15	0.95	0.43	1.04	0.62
Control Delay		22.5		77.6	13.8	60.8	48.4	13.3	71.3	15.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.5		77.6	13.8	60.8	48.4	13.3	71.3	15.0
LOS		C		E	B	E	D	B	E	B
Approach Delay		22.5		40.2			43.6			28.5
Approach LOS		C		D			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 35.7	Intersection LOS: D
Intersection Capacity Utilization 95.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	379	47	606	19	1046	179	475	1463	43
Future Volume (veh/h)	8	6	4	379	47	606	19	1046	179	475	1463	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	395	49	585	20	1090	160	495	1524	42
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	44	27	6	330	34	968	66	1147	357	479	2402	66
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.04	0.23	0.23	0.30	0.49	0.49
Sat Flow, veh/h	0	79	17	801	99	1509	1619	4914	1530	1619	4917	135
Grp Volume(v), veh/h	17	0	0	444	0	585	20	1090	160	495	1015	551
Grp Sat Flow(s),veh/h/ln	96	0	0	900	0	1509	1619	1638	1530	1619	1638	1776
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	27.5	1.4	26.2	10.7	35.5	27.6	27.6
Cycle Q Clear(g_c), s	41.0	0.0	0.0	41.0	0.0	27.5	1.4	26.2	10.7	35.5	27.6	27.6
Prop In Lane	0.47		0.18	0.89		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	77	0	0	364	0	968	66	1147	357	479	1601	868
V/C Ratio(X)	0.22	0.00	0.00	1.22	0.00	0.60	0.30	0.95	0.45	1.03	0.63	0.63
Avail Cap(c_a), veh/h	77	0	0	364	0	968	135	1147	357	479	1601	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.84	0.84	0.84	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	0.0	42.7	0.0	12.9	55.9	45.3	39.4	42.2	22.7	22.7
Incr Delay (d2), s/veh	0.5	0.0	0.0	120.9	0.0	0.8	0.8	15.1	3.4	50.0	1.9	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	24.3	0.0	11.5	0.7	13.4	4.9	22.5	12.8	14.3
LnGrp Delay(d),s/veh	33.0	0.0	0.0	163.6	0.0	13.6	56.7	60.4	42.8	92.3	24.7	26.3
LnGrp LOS	C			F		B	E	E	D	F	C	C
Approach Vol, veh/h		17			1029			1270			2061	
Approach Delay, s/veh		33.0			78.3			58.1			41.3	
Approach LOS		C			E			E			D	

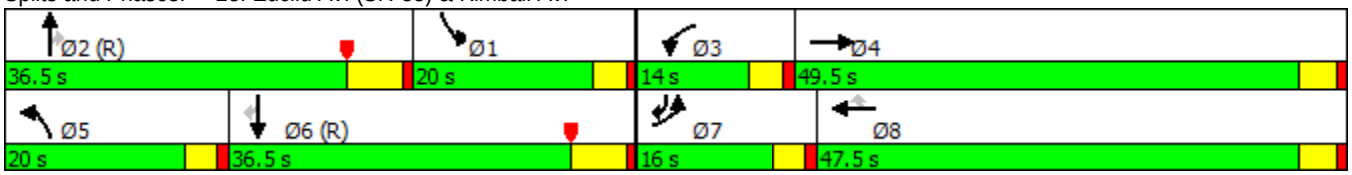
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	40.0	34.0		46.0	9.4	64.6		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	35.5	28.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	37.5	28.2		43.0	3.4	29.6		43.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	18.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	54.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	274	358	130	588	144	172	771	198	393	716	614
Future Volume (vph)	274	358	130	588	144	172	771	198	393	716	614
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	45.5	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	16.0	49.5	14.0	47.5	47.5	20.0	36.5	36.5	20.0	36.5	16.0
Total Split (%)	13.3%	41.3%	11.7%	39.6%	39.6%	16.7%	30.4%	30.4%	16.7%	30.4%	13.3%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.5	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	15.7	31.6	12.6	28.4	28.4	16.7	38.0	38.0	19.4	40.7	58.4
Actuated g/C Ratio	0.13	0.26	0.10	0.24	0.24	0.14	0.32	0.32	0.16	0.34	0.49
v/c Ratio	0.68	0.46	0.79	0.74	0.31	0.79	0.51	0.32	0.79	0.44	0.78
Control Delay	60.1	36.8	84.1	47.5	5.7	54.5	30.6	12.3	58.6	30.7	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	36.8	84.1	47.5	5.7	54.5	30.6	12.3	58.6	30.7	31.1
LOS	E	D	F	D	A	D	C	B	E	C	C
Approach Delay		46.2		46.1			31.1			37.2	
Approach LOS		D		D			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 49 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 38.7	Intersection LOS: D
Intersection Capacity Utilization 78.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	358	45	130	588	144	172	771	198	393	716	614
Future Volume (veh/h)	274	358	45	130	588	144	172	771	198	393	716	614
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	280	365	44	133	600	125	176	787	194	401	731	589
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	314	733	88	135	758	339	202	1008	314	950	1963	757
Arrive On Green	0.10	0.24	0.24	0.08	0.22	0.22	0.04	0.07	0.07	0.30	0.40	0.40
Sat Flow, veh/h	3141	3077	368	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	280	202	207	133	600	125	176	787	194	401	731	589
Grp Sat Flow(s),veh/h/ln	1570	1710	1735	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	10.6	12.2	12.4	9.8	19.9	4.1	13.0	18.9	11.7	12.3	12.6	38.4
Cycle Q Clear(g_c), s	10.6	12.2	12.4	9.8	19.9	4.1	13.0	18.9	11.7	12.3	12.6	38.4
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	314	408	414	135	758	339	202	1008	314	950	1963	757
V/C Ratio(X)	0.89	0.50	0.50	0.99	0.79	0.37	0.87	0.78	0.62	0.42	0.37	0.78
Avail Cap(c_a), veh/h	314	641	651	135	1226	548	216	1249	389	950	1963	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	0.68	0.68	0.68	0.75	0.75	0.75
Uniform Delay (d), s/veh	53.4	39.5	39.5	54.9	44.1	9.9	56.6	53.3	32.1	33.5	25.4	24.6
Incr Delay (d2), s/veh	23.2	0.8	0.9	72.8	0.7	0.2	20.2	4.1	6.1	0.1	0.4	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	5.9	6.0	7.1	9.5	1.8	7.0	9.0	5.5	5.3	5.8	17.1
LnGrp Delay(d),s/veh	76.6	40.3	40.4	127.7	44.8	10.1	76.8	57.4	38.2	33.6	25.8	30.5
LnGrp LOS	E	D	D	F	D	B	E	E	D	C	C	C
Approach Vol, veh/h		689			858			1157			1721	
Approach Delay, s/veh		55.1			52.6			57.1			29.2	
Approach LOS		E			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.3	30.6	14.0	33.1	19.0	53.9	16.0	31.1
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.0	* 31	10.0	45.0	16.0	30.5	12.0	43.0
Max Q Clear Time (g_c+I1), s	14.3	20.9	11.8	14.4	15.0	40.4	12.6	21.9
Green Ext Time (p_c), s	1.3	3.7	0.0	5.0	0.0	0.0	0.0	4.7

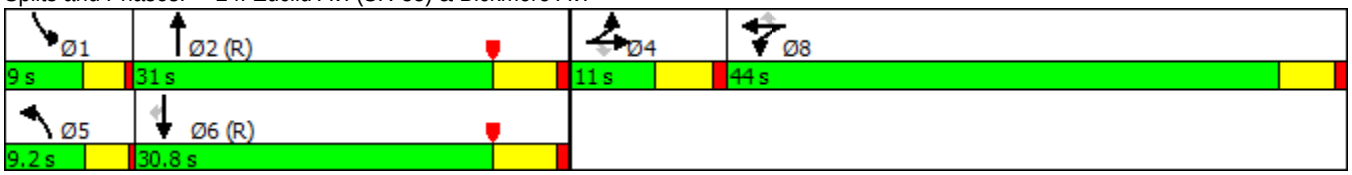
Intersection Summary	
HCM 2010 Ctrl Delay	45.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	85	28	51	282	403	254	79	773	74	676	110
Future Volume (vph)	85	28	51	282	403	254	79	773	74	676	110
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	11.0	11.0	11.0	44.0	44.0	44.0	9.2	31.0	9.0	30.8	30.8
Total Split (%)	11.6%	11.6%	11.6%	46.3%	46.3%	46.3%	9.7%	32.6%	9.5%	32.4%	32.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	6.3	6.3	6.3	31.2	31.2	31.2	8.3	30.6	8.0	30.2	30.2
Actuated g/C Ratio	0.07	0.07	0.07	0.33	0.33	0.33	0.09	0.32	0.08	0.32	0.32
v/c Ratio	0.84	0.25	0.25	0.54	0.82	0.42	0.60	0.82	0.59	0.66	0.21
Control Delay	99.3	48.0	2.7	29.0	41.3	8.1	61.5	38.6	61.7	32.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	48.0	2.7	29.0	41.3	8.1	61.5	38.6	61.7	32.9	6.0
LOS	F	D	A	C	D	A	E	D	E	C	A
Approach Delay		60.5			29.0			40.6		32.0	
Approach LOS		E			C			D		C	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	28	51	282	403	254	79	773	67	74	676	110
Future Volume (veh/h)	85	28	51	282	403	254	79	773	67	74	676	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	90	30	52	300	429	257	84	822	70	79	719	108
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	102	114	96	441	490	416	97	1298	111	94	1384	619
Arrive On Green	0.06	0.06	0.06	0.27	0.27	0.27	0.06	0.41	0.41	0.06	0.40	0.40
Sat Flow, veh/h	1619	1800	1523	1619	1800	1530	1619	3190	272	1619	3420	1530
Grp Volume(v), veh/h	90	30	52	300	429	257	84	441	451	79	719	108
Grp Sat Flow(s),veh/h/ln	1619	1800	1523	1619	1800	1530	1619	1710	1752	1619	1710	1530
Q Serve(g_s), s	5.2	1.5	3.1	15.7	21.6	14.0	4.9	19.6	19.6	4.6	15.1	4.3
Cycle Q Clear(g_c), s	5.2	1.5	3.1	15.7	21.6	14.0	4.9	19.6	19.6	4.6	15.1	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	102	114	96	441	490	416	97	696	713	94	1384	619
V/C Ratio(X)	0.88	0.26	0.54	0.68	0.88	0.62	0.86	0.63	0.63	0.84	0.52	0.17
Avail Cap(c_a), veh/h	102	114	96	665	739	628	97	696	713	94	1384	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.32	0.32	0.32	0.86	0.86	0.86
Uniform Delay (d), s/veh	44.1	42.4	43.2	30.9	33.0	30.2	44.3	22.5	22.5	44.3	21.3	18.1
Incr Delay (d2), s/veh	51.5	0.5	3.4	0.7	5.4	0.6	20.9	1.4	1.4	40.3	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.8	1.4	7.1	11.5	5.9	2.8	9.4	9.7	3.1	7.3	1.9
LnGrp Delay(d),s/veh	95.7	42.9	46.5	31.6	38.4	30.8	65.2	23.9	23.9	84.6	22.5	18.6
LnGrp LOS	F	D	D	C	D	C	E	C	C	F	C	B
Approach Vol, veh/h		172			986			976			906	
Approach Delay, s/veh		71.6			34.4			27.5			27.5	
Approach LOS		E			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.0	44.1		11.0	9.2	43.9		30.9
Change Period (Y+Rc), s	3.5	5.5		5.0	3.5	5.5		5.0
Max Green Setting (Gmax), s	5.5	25.5		6.0	5.7	25.3		39.0
Max Q Clear Time (g_c+I1), s	6.6	21.6		7.2	6.9	17.1		23.6
Green Ext Time (p_c), s	0.0	2.3		0.0	0.0	4.0		2.2

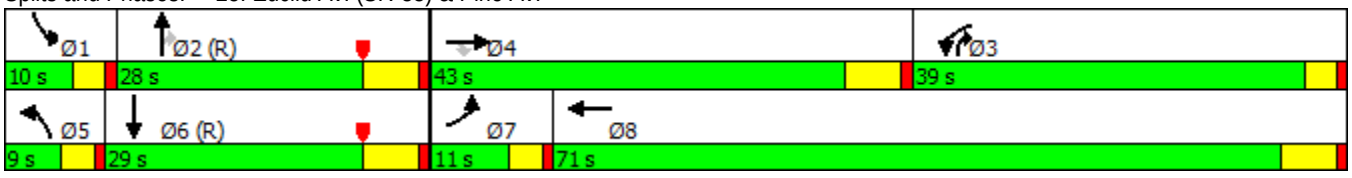
Intersection Summary	
HCM 2010 Ctrl Delay	32.2
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	218	33	879	166	58	892	496	84	904
Future Volume (vph)	5	218	33	879	166	58	892	496	84	904
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	11.0	43.0	43.0	39.0	71.0	9.0	28.0	39.0	10.0	29.0
Total Split (%)	9.2%	35.8%	35.8%	32.5%	59.2%	7.5%	23.3%	32.5%	8.3%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.3	22.8	22.8	42.1	66.8	8.0	24.4	68.4	10.8	27.2
Actuated g/C Ratio	0.04	0.19	0.19	0.35	0.56	0.07	0.20	0.57	0.09	0.23
v/c Ratio	0.07	0.65	0.09	0.86	0.28	0.55	0.90	0.48	0.59	0.83
Control Delay	57.0	52.5	0.4	46.3	12.4	73.2	44.9	2.2	58.2	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	52.5	0.4	46.3	12.4	73.2	44.9	2.2	58.2	38.6
LOS	E	D	A	D	B	E	D	A	E	D
Approach Delay		45.9			38.4		31.4			40.2
Approach LOS		D			D		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 40 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 36.8	Intersection LOS: D
Intersection Capacity Utilization 81.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	218	33	879	166	100	58	892	496	84	904	15
Future Volume (veh/h)	5	218	33	879	166	100	58	892	496	84	904	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	220	0	888	168	86	59	901	323	85	913	10
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	266	226	862	503	257	67	1609	936	81	1682	18
Arrive On Green	0.01	0.15	0.00	0.29	0.45	0.45	0.04	0.33	0.33	0.02	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1118	572	1619	4914	1496	1619	5010	55
Grp Volume(v), veh/h	5	220	0	888	0	254	59	901	323	85	597	326
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1690	1619	1638	1496	1619	1638	1789
Q Serve(g_s), s	0.4	14.2	0.0	35.0	0.0	11.7	4.3	18.1	2.8	6.0	20.7	20.7
Cycle Q Clear(g_c), s	0.4	14.2	0.0	35.0	0.0	11.7	4.3	18.1	2.8	6.0	20.7	20.7
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	266	226	862	0	760	67	1609	936	81	1100	601
V/C Ratio(X)	0.48	0.83	0.00	1.03	0.00	0.33	0.87	0.56	0.35	1.05	0.54	0.54
Avail Cap(c_a), veh/h	94	555	472	862	0	916	67	1609	936	81	1100	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.27	0.27	0.27	0.80	0.80	0.80
Uniform Delay (d), s/veh	59.4	49.7	0.0	42.5	0.0	21.4	57.2	33.2	3.5	59.0	44.6	44.6
Incr Delay (d2), s/veh	12.4	9.0	0.0	38.6	0.0	0.4	26.1	0.4	0.3	103.8	1.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.8	0.0	18.9	0.0	5.5	2.4	8.2	2.7	5.0	9.6	10.8
LnGrp Delay(d),s/veh	71.8	58.6	0.0	81.1	0.0	21.8	83.2	33.6	3.8	163.9	46.2	47.5
LnGrp LOS	E	E		F		C	F	C	A	F	D	D
Approach Vol, veh/h		225			1142			1283			1008	
Approach Delay, s/veh		58.9			67.9			28.4			56.5	
Approach LOS		E			E			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	45.3	41.0	23.7	9.0	46.3	4.8	60.0
Change Period (Y+Rc), s	4.0	6.0	6.0	* 6	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	22.0	35.0	* 37	5.0	23.0	7.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	20.1	37.0	16.2	6.3	22.7	2.4	13.7
Green Ext Time (p_c), s	0.0	1.4	0.0	1.5	0.0	0.2	0.0	3.7

Intersection Summary	
HCM 2010 Ctrl Delay	50.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	398	409	5	463	19	19	95	12
Future Volume (vph)	398	409	5	463	19	19	95	12
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	31.0	48.8	9.6	27.4	31.6	31.6	31.6	31.6
Total Split (%)	34.4%	54.2%	10.7%	30.4%	35.1%	35.1%	35.1%	35.1%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	23.8	45.8	5.1	19.0		22.3		22.3
Actuated g/C Ratio	0.29	0.57	0.06	0.23		0.28		0.28
v/c Ratio	0.88	0.23	0.05	0.80		0.14		0.82
Control Delay	50.8	10.3	41.4	39.1		24.2		46.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	50.8	10.3	41.4	39.1		24.2		46.0
LOS	D	B	D	D		C		D
Approach Delay		30.0		39.1		24.2		46.0
Approach LOS		C		D		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 79.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	398	409	11	5	463	122	19	19	18	95	12	200
Future Volume (veh/h)	398	409	11	5	463	122	19	19	18	95	12	200
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	419	431	12	5	487	128	20	20	19	100	13	211
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	459	1769	49	11	651	170	159	153	116	165	35	251
Arrive On Green	0.28	0.52	0.52	0.01	0.24	0.24	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1619	3396	94	1619	2670	697	358	601	456	388	139	984
Grp Volume(v), veh/h	419	217	226	5	311	304	59	0	0	324	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1781	1619	1710	1657	1416	0	0	1511	0	0
Q Serve(g_s), s	17.7	4.9	4.9	0.2	11.9	12.1	0.0	0.0	0.0	11.5	0.0	0.0
Cycle Q Clear(g_c), s	17.7	4.9	4.9	0.2	11.9	12.1	1.9	0.0	0.0	14.3	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.42	0.34		0.32	0.31		0.65
Lane Grp Cap(c), veh/h	459	891	928	11	417	404	429	0	0	452	0	0
V/C Ratio(X)	0.91	0.24	0.24	0.47	0.74	0.75	0.14	0.00	0.00	0.72	0.00	0.00
Avail Cap(c_a), veh/h	603	1028	1070	114	512	496	612	0	0	640	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.5	9.3	9.3	35.1	24.8	24.8	20.4	0.0	0.0	24.9	0.0	0.0
Incr Delay (d2), s/veh	13.4	0.1	0.1	11.3	4.6	5.1	0.1	0.0	0.0	2.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	2.3	2.4	0.1	6.1	6.1	0.9	0.0	0.0	6.2	0.0	0.0
LnGrp Delay(d),s/veh	37.9	9.5	9.4	46.4	29.4	29.9	20.5	0.0	0.0	27.2	0.0	0.0
LnGrp LOS	D	A	A	D	C	C	C			C		
Approach Vol, veh/h		862			620			59			324	
Approach Delay, s/veh		23.3			29.8			20.5			27.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	43.1		22.7	24.7	23.5		22.7
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	42.6		27.0	26.4	21.2		27.0
Max Q Clear Time (g_c+I1), s	2.2	6.9		16.3	19.7	14.1		3.9
Green Ext Time (p_c), s	0.0	6.4		1.6	0.4	3.2		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	26.0
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	193	294	456	118	251
Future Volume (vph)	228	193	294	456	118	251
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	24.0	56.8	32.8	32.8
Total Split (%)	36.9%	36.9%	26.7%	63.1%	36.4%	36.4%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	15.6	13.9	17.4	35.3	13.0	13.0
Actuated g/C Ratio	0.25	0.23	0.28	0.57	0.21	0.21
v/c Ratio	0.60	0.41	0.69	0.48	0.34	0.50
Control Delay	28.2	6.4	32.4	10.3	24.7	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	6.4	32.4	10.3	24.7	7.0
LOS	C	A	C	B	C	A
Approach Delay				19.0	12.7	
Approach LOS				B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 61.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 47.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	228	0	193	0	0	0	294	456	0	0	118	251
Future Volume (veh/h)	228	0	193	0	0	0	294	456	0	0	118	251
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	245	0	208				316	490	0	0	127	270
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	316	0	299				372	1076	0	0	498	423
Arrive On Green	0.20	0.00	0.20				0.23	0.60	0.00	0.00	0.28	0.28
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1530
Grp Volume(v), veh/h	245	0	208				316	490	0	0	127	270
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1530
Q Serve(g_s), s	7.2	0.0	6.4				9.4	7.6	0.0	0.0	2.8	7.8
Cycle Q Clear(g_c), s	7.2	0.0	6.4				9.4	7.6	0.0	0.0	2.8	7.8
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	316	0	299				372	1076	0	0	498	423
V/C Ratio(X)	0.78	0.00	0.70				0.85	0.46	0.00	0.00	0.25	0.64
Avail Cap(c_a), veh/h	921	0	870				625	1826	0	0	967	822
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	18.8				18.5	5.6	0.0	0.0	14.1	16.0
Incr Delay (d2), s/veh	1.6	0.0	1.1				2.4	0.3	0.0	0.0	0.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	5.3				4.4	3.8	0.0	0.0	1.4	6.7
LnGrp Delay(d),s/veh	20.7	0.0	19.9				20.9	5.9	0.0	0.0	14.4	17.6
LnGrp LOS	C		B				C	A			B	B
Approach Vol, veh/h		453						806			397	
Approach Delay, s/veh		20.4						11.8			16.6	
Approach LOS		C						B			B	

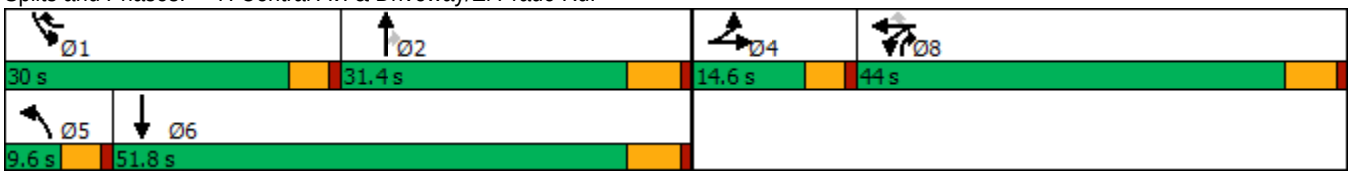
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		35.9		14.4	16.1	19.7		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		51.0		28.6	19.4	27.0		
Max Q Clear Time (g_c+I1), s		9.6		9.2	11.4	9.8		
Green Ext Time (p_c), s		4.9		0.6	0.3	4.1		

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	26	5	748	4	475	9	572	826	573	709
Future Volume (vph)	26	5	748	4	475	9	572	826	573	709
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	44.0	44.0	30.0	9.6	31.4	44.0	30.0	51.8
Total Split (%)	12.2%	12.2%	36.7%	36.7%	25.0%	8.0%	26.2%	36.7%	25.0%	43.2%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.2	10.2	34.7	34.7	64.3	5.1	26.2	60.9	23.7	52.8
Actuated g/C Ratio	0.09	0.09	0.31	0.31	0.57	0.05	0.23	0.54	0.21	0.47
v/c Ratio	0.18	0.16	0.82	0.78	0.51	0.12	0.75	0.87	0.90	0.33
Control Delay	54.5	26.4	52.1	48.3	9.6	59.2	48.9	20.9	62.1	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	26.4	52.1	48.3	9.6	59.2	48.9	20.9	62.1	20.9
LOS	D	C	D	D	A	E	D	C	E	C
Approach Delay		40.7		34.5			32.5			39.1
Approach LOS		D		C			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.1	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 93.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	5	20	748	4	475	9	572	826	573	709	18
Future Volume (veh/h)	26	5	20	748	4	475	9	572	826	573	709	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	27	5	12	782	0	344	9	596	684	597	739	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	111	32	78	910	0	751	18	831	797	658	2189	44
Arrive On Green	0.07	0.07	0.07	0.28	0.00	0.28	0.01	0.24	0.24	0.21	0.44	0.44
Sat Flow, veh/h	1619	471	1130	3238	0	1530	1619	3420	1508	3141	4955	100
Grp Volume(v), veh/h	27	0	17	782	0	344	9	596	684	597	488	266
Grp Sat Flow(s),veh/h/ln	1619	0	1601	1619	0	1530	1619	1710	1508	1570	1638	1780
Q Serve(g_s), s	1.7	0.0	1.1	24.1	0.0	15.6	0.6	16.8	25.6	19.5	10.3	10.3
Cycle Q Clear(g_c), s	1.7	0.0	1.1	24.1	0.0	15.6	0.6	16.8	25.6	19.5	10.3	10.3
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	111	0	110	910	0	751	18	831	797	658	1447	786
V/C Ratio(X)	0.24	0.00	0.15	0.86	0.00	0.46	0.51	0.72	0.86	0.91	0.34	0.34
Avail Cap(c_a), veh/h	154	0	152	1174	0	876	77	831	797	757	1447	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	0.0	46.2	35.9	0.0	17.6	51.8	36.5	18.0	40.6	19.3	19.3
Incr Delay (d2), s/veh	0.4	0.0	0.2	5.3	0.0	0.4	8.0	5.3	11.6	12.5	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	11.4	0.0	6.7	0.3	8.6	22.3	9.6	4.8	5.4
LnGrp Delay(d),s/veh	46.9	0.0	46.4	41.2	0.0	18.1	59.8	41.8	29.6	53.1	19.9	20.5
LnGrp LOS	D		D	D		B	E	D	C	D	B	C
Approach Vol, veh/h		44			1126			1289			1351	
Approach Delay, s/veh		46.7			34.1			35.5			34.7	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.7	31.4		11.8	5.8	52.3		35.4
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	25.4	25.6		10.0	5.0	46.0		38.2
Max Q Clear Time (g_c+I1), s	21.5	27.6		3.7	2.6	12.3		26.1
Green Ext Time (p_c), s	0.5	0.0		0.0	0.0	7.2		3.5

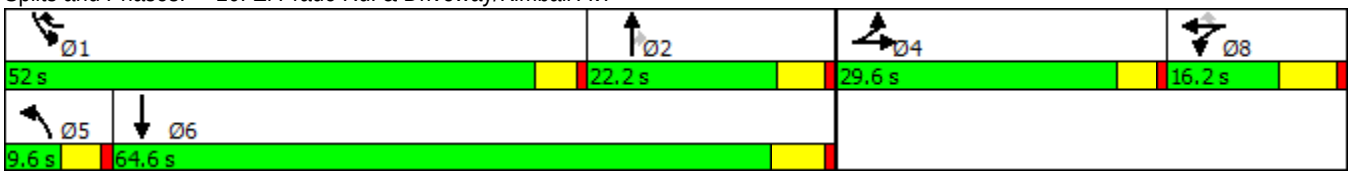
Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	35	8	3	871	4	202	24	991	352
Future Volume (vph)	35	8	3	871	4	202	24	991	352
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	52.0	9.6	22.2	22.2	52.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	43.3%	8.0%	18.5%	18.5%	43.3%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	14.7	14.7	12.8	40.5	6.4	16.8	16.8	33.2	42.9
Actuated g/C Ratio	0.19	0.19	0.16	0.52	0.08	0.21	0.21	0.42	0.55
v/c Ratio	0.12	0.05	0.10	0.85	0.03	0.55	0.06	0.79	0.40
Control Delay	39.9	28.9	46.2	15.4	51.2	43.8	0.2	28.0	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	28.9	46.2	15.4	51.2	43.8	0.2	28.0	15.0
LOS	D	C	D	B	D	D	A	C	B
Approach Delay		36.6	16.3			39.4			24.5
Approach LOS		D	B			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 78.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 88.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	8	8	23	3	871	4	202	24	991	352	14
Future Volume (veh/h)	35	8	8	23	3	871	4	202	24	991	352	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	37	8	6	24	3	466	4	213	24	1043	371	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	137	81	61	191	24	751	101	287	244	1150	798	30
Arrive On Green	0.08	0.08	0.08	0.12	0.12	0.12	0.06	0.16	0.16	0.37	0.46	0.46
Sat Flow, veh/h	1619	956	717	1532	191	1530	1619	1800	1530	3141	1723	65
Grp Volume(v), veh/h	37	0	14	27	0	466	4	213	24	1043	0	385
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1723	0	1530	1619	1800	1530	1570	0	1788
Q Serve(g_s), s	1.7	0.0	0.6	1.1	0.0	10.0	0.2	9.0	1.1	25.2	0.0	11.8
Cycle Q Clear(g_c), s	1.7	0.0	0.6	1.1	0.0	10.0	0.2	9.0	1.1	25.2	0.0	11.8
Prop In Lane	1.00		0.43	0.89		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	137	0	142	215	0	751	101	287	244	1150	0	828
V/C Ratio(X)	0.27	0.00	0.10	0.13	0.00	0.62	0.04	0.74	0.10	0.91	0.00	0.46
Avail Cap(c_a), veh/h	506	0	523	215	0	751	101	382	325	1860	0	1313
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.3	0.0	33.8	31.1	0.0	14.9	35.3	32.1	28.7	24.1	0.0	14.7
Incr Delay (d2), s/veh	1.0	0.0	0.3	0.3	0.0	1.6	0.1	5.3	0.2	2.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.3	0.5	0.0	7.8	0.1	4.9	0.5	11.3	0.0	5.9
LnGrp Delay(d),s/veh	35.4	0.0	34.1	31.4	0.0	16.5	35.3	37.3	28.9	26.8	0.0	15.1
LnGrp LOS	D		C	C		B	D	D	C	C		B
Approach Vol, veh/h		51			493			241			1428	
Approach Delay, s/veh		35.0			17.3			36.5			23.7	
Approach LOS		D			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	33.9	18.6		11.4	9.6	42.9		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	47.4	* 17		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	27.2	11.0		3.7	2.2	13.8		12.0
Green Ext Time (p_c), s	2.1	1.7		0.1	0.0	3.7		0.0

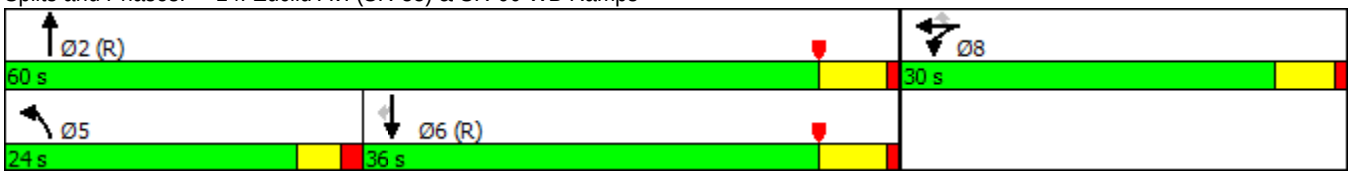
Intersection Summary	
HCM 2010 Ctrl Delay	23.9
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	636	6	414	540	1056	929	538
Future Volume (vph)	636	6	414	540	1056	929	538
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	24.0	60.0	36.0	36.0
Total Split (%)	33.3%	33.3%	33.3%	26.7%	66.7%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.0	24.0	24.0	18.6	55.5	32.4	32.4
Actuated g/C Ratio	0.27	0.27	0.27	0.21	0.62	0.36	0.36
v/c Ratio	0.93	0.91	0.78	0.88	0.53	0.79	0.63
Control Delay	63.9	58.8	35.5	38.7	17.7	32.4	5.6
Queue Delay	4.0	3.1	0.0	0.0	0.7	0.0	0.0
Total Delay	67.9	61.9	35.5	38.7	18.4	32.4	5.6
LOS	E	E	D	D	B	C	A
Approach Delay		55.7			25.3	22.6	
Approach LOS		E			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 51 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 32.1	Intersection LOS: C
Intersection Capacity Utilization 101.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	636	6	414	540	1056	0	0	929	538
Future Volume (veh/h)	0	0	0	636	6	414	540	1056	0	0	929	538
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				759	0	190	568	1112	0	0	978	566
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				833	0	388	641	2142	0	0	1273	558
Arrive On Green				0.26	0.00	0.26	0.07	0.21	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1510	3141	3510	0	0	3510	1500
Grp Volume(v), veh/h				759	0	190	568	1112	0	0	978	566
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1570	1710	0	0	1710	1500
Q Serve(g_s), s				20.5	0.0	9.6	16.1	26.0	0.0	0.0	22.6	33.5
Cycle Q Clear(g_c), s				20.5	0.0	9.6	16.1	26.0	0.0	0.0	22.6	33.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				833	0	388	641	2142	0	0	1273	558
V/C Ratio(X)				0.91	0.00	0.49	0.89	0.52	0.00	0.00	0.77	1.01
Avail Cap(c_a), veh/h				899	0	420	681	2142	0	0	1273	558
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.47	0.47	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.4	0.0	28.4	40.9	23.7	0.0	0.0	24.8	28.3
Incr Delay (d2), s/veh				12.2	0.0	0.4	6.4	0.4	0.0	0.0	4.5	41.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.6	0.0	4.0	7.6	12.5	0.0	0.0	11.4	20.2
LnGrp Delay(d),s/veh				44.6	0.0	28.8	47.3	24.1	0.0	0.0	29.3	69.8
LnGrp LOS				D		C	D	C			C	F
Approach Vol, veh/h					949			1680			1544	
Approach Delay, s/veh					41.4			31.9			44.2	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.9			22.9	39.0		28.1
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		54.5			19.5	30.5		25.0
Max Q Clear Time (g_c+I1), s		28.0			18.1	35.5		22.5
Green Ext Time (p_c), s		23.1			0.2	0.0		0.7

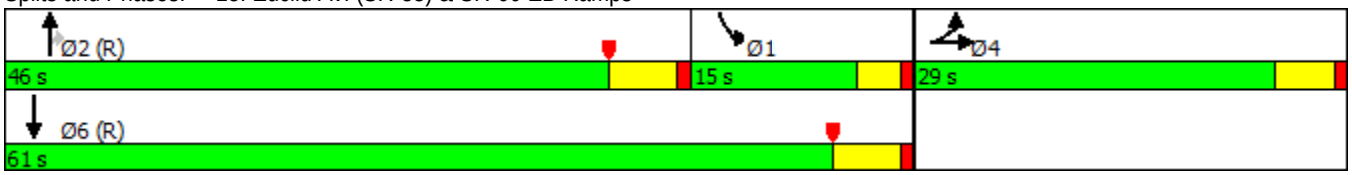
Intersection Summary	
HCM 2010 Ctrl Delay	38.6
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	384	2	1213	766	307	1259
Future Volume (vph)	384	2	1213	766	307	1259
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	46.0	46.0	15.0	61.0
Total Split (%)	32.2%	32.2%	51.1%	51.1%	16.7%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lead	Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.2	24.2	40.5	40.5	10.8	55.3
Actuated g/C Ratio	0.27	0.27	0.45	0.45	0.12	0.61
v/c Ratio	0.85	1.36	0.80	0.71	0.84	0.61
Control Delay	52.7	204.3	26.4	5.4	57.5	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	3.9
Total Delay	52.7	204.3	26.4	5.4	57.5	17.6
LOS	D	F	C	A	E	B
Approach Delay		148.3	18.2			25.4
Approach LOS		F	B			C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.36	
Intersection Signal Delay: 47.9	Intersection LOS: D
Intersection Capacity Utilization 101.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	384	2	550	0	0	0	0	1213	766	307	1259	0
Future Volume (veh/h)	384	2	550	0	0	0	0	1213	766	307	1259	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	392	2	484				0	1238	782	313	1285	0
Adj No. of Lanes	1	1	0				0	2	1	2	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	432	2	407				0	1539	677	811	2631	0
Arrive On Green	0.27	0.27	0.27				0.00	0.45	0.45	0.34	1.00	0.00
Sat Flow, veh/h	1619	6	1525				0	3510	1504	3141	3510	0
Grp Volume(v), veh/h	392	0	486				0	1238	782	313	1285	0
Grp Sat Flow(s),veh/h/ln	1619	0	1531				0	1710	1504	1570	1710	0
Q Serve(g_s), s	21.1	0.0	24.0				0.0	28.1	40.5	6.8	0.0	0.0
Cycle Q Clear(g_c), s	21.1	0.0	24.0				0.0	28.1	40.5	6.8	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	408				0	1539	677	811	2631	0
V/C Ratio(X)	0.91	0.00	1.19				0.00	0.80	1.16	0.39	0.49	0.00
Avail Cap(c_a), veh/h	432	0	408				0	1539	677	811	2631	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.59	0.59	0.44	0.44	0.00
Uniform Delay (d), s/veh	31.9	0.0	33.0				0.0	21.3	24.8	24.2	0.0	0.0
Incr Delay (d2), s/veh	22.2	0.0	107.6				0.0	2.7	80.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	0.0	22.3				0.0	13.8	31.8	2.9	0.1	0.0
LnGrp Delay(d),s/veh	54.2	0.0	140.6				0.0	24.1	104.7	24.2	0.3	0.0
LnGrp LOS	D		F					C	F	C	A	
Approach Vol, veh/h		878						2020			1598	
Approach Delay, s/veh		102.0						55.3			5.0	
Approach LOS		F						E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	28.9	46.0		29.0		74.9		
Change Period (Y+Rc), s	5.5	* 5.5		5.0		5.5		
Max Green Setting (Gmax), s	11.0	* 41		24.0		55.5		
Max Q Clear Time (g_c+I1), s	8.8	42.5		26.0		2.0		
Green Ext Time (p_c), s	0.9	0.0		0.0		20.0		

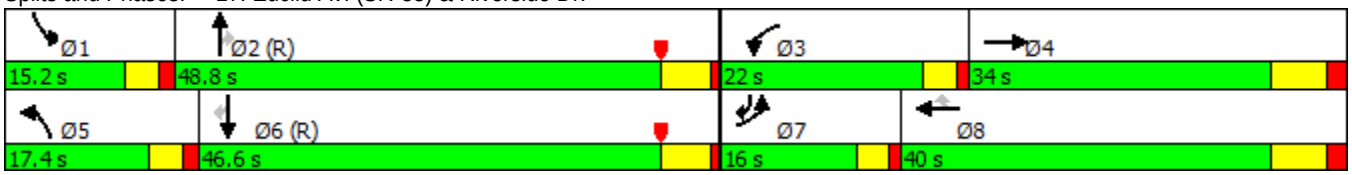
Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	149	383	175	344	55	108	1535	275	130	1191	165
Future Volume (vph)	149	383	175	344	55	108	1535	275	130	1191	165
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	16.0	34.0	22.0	40.0	40.0	17.4	48.8	48.8	15.2	46.6	16.0
Total Split (%)	13.3%	28.3%	18.3%	33.3%	33.3%	14.5%	40.7%	40.7%	12.7%	38.8%	13.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.7	23.5	16.4	27.3	27.3	12.2	45.7	45.7	13.3	46.8	61.0
Actuated g/C Ratio	0.11	0.20	0.14	0.23	0.23	0.10	0.38	0.38	0.11	0.39	0.51
v/c Ratio	0.94	0.76	0.85	0.48	0.14	0.71	0.88	0.40	0.78	0.67	0.21
Control Delay	108.9	51.2	82.5	41.3	2.1	54.6	49.5	16.8	66.6	29.0	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.9	51.2	82.5	41.3	2.1	54.6	49.5	16.8	66.6	29.0	11.1
LOS	F	D	F	D	A	D	D	B	E	C	B
Approach Delay		65.0		50.1			45.1			30.3	
Approach LOS		E		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 43.6	Intersection LOS: D
Intersection Capacity Utilization 81.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	383	90	175	344	55	108	1535	275	130	1191	165
Future Volume (veh/h)	149	383	90	175	344	55	108	1535	275	130	1191	165
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	160	412	63	188	370	59	116	1651	165	140	1281	79
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	551	84	212	739	326	140	2062	642	144	2075	790
Arrive On Green	0.10	0.19	0.19	0.13	0.22	0.22	0.03	0.14	0.14	0.03	0.14	0.14
Sat Flow, veh/h	1619	2978	452	1619	3420	1507	1619	4914	1530	1619	4914	1508
Grp Volume(v), veh/h	160	235	240	188	370	59	116	1651	165	140	1281	79
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	1507	1619	1638	1530	1619	1638	1508
Q Serve(g_s), s	11.8	15.6	15.8	13.7	11.4	3.8	8.6	39.1	11.6	10.4	29.5	4.6
Cycle Q Clear(g_c), s	11.8	15.6	15.8	13.7	11.4	3.8	8.6	39.1	11.6	10.4	29.5	4.6
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	317	318	212	739	326	140	2062	642	144	2075	790
V/C Ratio(X)	0.99	0.74	0.75	0.89	0.50	0.18	0.83	0.80	0.26	0.97	0.62	0.10
Avail Cap(c_a), veh/h	162	385	387	243	941	414	174	2062	642	144	2075	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.46	0.46	0.46	0.77	0.77	0.77
Uniform Delay (d), s/veh	53.9	46.2	46.3	51.3	41.3	38.4	57.4	46.8	35.0	58.1	42.5	22.0
Incr Delay (d2), s/veh	67.0	7.2	7.6	25.7	0.7	0.4	11.8	1.6	0.4	56.9	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	8.0	8.2	7.6	5.5	1.6	4.3	18.1	5.0	6.9	13.6	1.9
LnGrp Delay(d),s/veh	120.9	53.4	53.9	76.9	42.1	38.7	69.2	48.4	35.4	114.9	43.6	22.2
LnGrp LOS	F	D	D	E	D	D	E	D	D	F	D	C
Approach Vol, veh/h		635			617			1932			1500	
Approach Delay, s/veh		70.6			52.4			48.5			49.1	
Approach LOS		E			D			D			D	

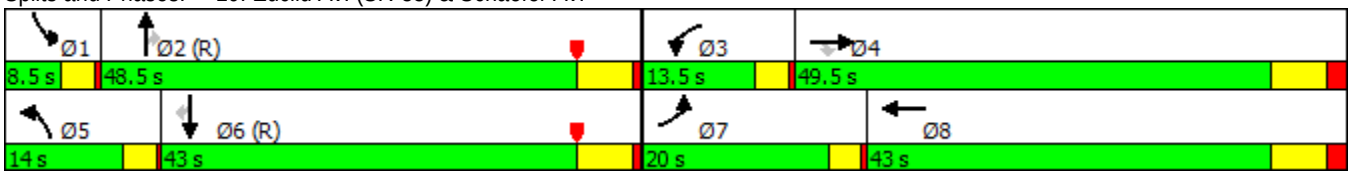
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	55.9	19.7	29.2	14.9	56.2	16.0	32.9
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	10.7	43.3	18.0	27.0	12.9	41.1	12.0	33.0
Max Q Clear Time (g_c+I1), s	12.4	41.1	15.7	17.8	10.6	31.5	13.8	13.4
Green Ext Time (p_c), s	0.0	2.2	0.1	4.4	0.1	8.9	0.0	6.9

Intersection Summary	
HCM 2010 Ctrl Delay	52.2
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	300	225	187	27	49	120	1841	41	22	1321	132
Future Volume (vph)	300	225	187	27	49	120	1841	41	22	1321	132
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	20.0	49.5	49.5	13.5	43.0	14.0	48.5	48.5	8.5	43.0	43.0
Total Split (%)	16.7%	41.3%	41.3%	11.3%	35.8%	11.7%	40.4%	40.4%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	16.5	25.4	25.4	10.0	15.8	13.2	67.8	67.8	5.7	56.8	56.8
Actuated g/C Ratio	0.14	0.21	0.21	0.08	0.13	0.11	0.56	0.56	0.05	0.47	0.47
v/c Ratio	1.39	0.61	0.41	0.21	0.28	0.70	0.68	0.05	0.30	0.59	0.17
Control Delay	239.9	48.5	7.0	55.4	36.6	52.5	32.4	3.1	60.9	27.6	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	239.9	48.5	7.0	55.4	36.6	52.5	32.4	3.1	60.9	27.6	8.3
LOS	F	D	A	E	D	D	C	A	E	C	A
Approach Delay		118.1			42.2		33.0			26.3	
Approach LOS		F			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.39	
Intersection Signal Delay: 45.1	Intersection LOS: D
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	225	187	27	49	15	120	1841	41	22	1321	132
Future Volume (veh/h)	300	225	187	27	49	15	120	1841	41	22	1321	132
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	309	232	117	28	51	10	124	1898	33	23	1362	83
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	277	236	82	98	19	142	2980	928	36	2660	810
Arrive On Green	0.14	0.15	0.15	0.05	0.07	0.07	0.06	0.41	0.41	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1463	287	1619	4914	1530	1619	4914	1496
Grp Volume(v), veh/h	309	232	117	28	0	61	124	1898	33	23	1362	83
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1749	1619	1638	1530	1619	1638	1496
Q Serve(g_s), s	16.5	15.0	8.4	2.0	0.0	4.0	9.1	37.1	1.6	1.7	30.1	5.6
Cycle Q Clear(g_c), s	16.5	15.0	8.4	2.0	0.0	4.0	9.1	37.1	1.6	1.7	30.1	5.6
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	277	236	82	0	117	142	2980	928	36	2660	810
V/C Ratio(X)	1.39	0.84	0.50	0.34	0.00	0.52	0.88	0.64	0.04	0.64	0.51	0.10
Avail Cap(c_a), veh/h	223	638	542	135	0	525	142	2980	928	67	2660	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.57	0.57	0.57	0.70	0.70	0.70
Uniform Delay (d), s/veh	51.8	49.3	46.5	55.0	0.0	54.1	55.8	25.0	14.5	59.1	35.0	24.9
Incr Delay (d2), s/veh	199.9	5.0	1.2	0.9	0.0	2.6	26.7	0.6	0.0	4.8	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.7	7.9	3.6	0.9	0.0	2.1	5.1	17.0	0.7	0.8	13.8	2.4
LnGrp Delay(d),s/veh	251.6	54.3	47.7	56.0	0.0	56.8	82.5	25.6	14.5	63.9	35.5	25.1
LnGrp LOS	F	D	D	E		E	F	C	B	E	D	C
Approach Vol, veh/h		658			89			2055			1468	
Approach Delay, s/veh		145.8			56.5			28.9			35.3	
Approach LOS		F			E			C			D	

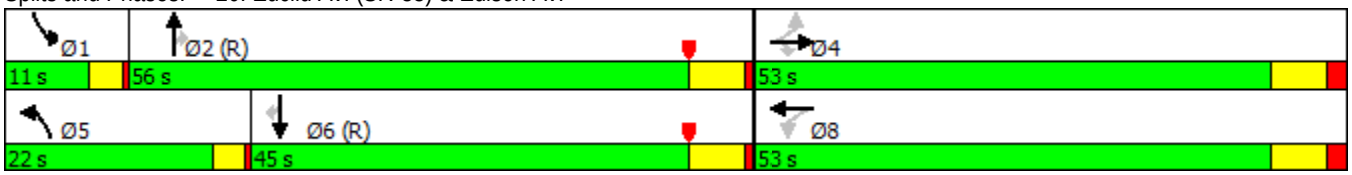
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	78.8	9.6	25.5	14.0	71.0	20.0	15.0
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	42.5	10.0	42.5	10.5	37.0	16.5	36.0
Max Q Clear Time (g_c+I1), s	3.7	39.1	4.0	17.0	11.1	32.1	18.5	6.0
Green Ext Time (p_c), s	0.0	3.3	0.0	1.5	0.0	4.7	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	49.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	343	471	280	28	140	171	1594	77	68	1292	169
Future Volume (vph)	343	471	280	28	140	171	1594	77	68	1292	169
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	22.0	56.0	56.0	11.0	45.0	45.0
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%	18.3%	46.7%	46.7%	9.2%	37.5%	37.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7	16.0	55.3	55.3	7.3	44.8	44.8
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.13	0.46	0.46	0.06	0.37	0.37
v/c Ratio	0.92	0.75	0.40	0.19	0.28	0.81	0.72	0.11	0.70	0.72	0.26
Control Delay	67.2	41.7	4.5	29.0	26.1	52.7	31.3	11.6	114.2	15.3	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	41.7	4.5	29.0	26.1	52.7	31.3	11.6	114.2	15.3	2.2
LOS	E	D	A	C	C	D	C	B	F	B	A
Approach Delay		40.2			26.5		32.5			18.2	
Approach LOS		D			C		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 29.4	Intersection LOS: C
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	343	471	280	28	140	30	171	1594	77	68	1292	169
Future Volume (veh/h)	343	471	280	28	140	30	171	1594	77	68	1292	169
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	350	481	194	29	143	26	174	1627	59	69	1318	145
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	427	685	574	174	565	103	200	2109	657	85	1759	548
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.14	0.14	0.11	0.72	0.72
Sat Flow, veh/h	1167	1800	1508	732	1483	270	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	350	481	194	29	0	169	174	1627	59	69	1318	145
Grp Sat Flow(s),veh/h/ln	1167	1800	1508	732	0	1752	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	35.2	27.1	11.0	4.2	0.0	7.9	12.8	38.3	4.0	5.0	19.7	4.0
Cycle Q Clear(g_c), s	43.2	27.1	11.0	31.3	0.0	7.9	12.8	38.3	4.0	5.0	19.7	4.0
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	427	685	574	174	0	667	200	2109	657	85	1759	548
V/C Ratio(X)	0.82	0.70	0.34	0.17	0.00	0.25	0.87	0.77	0.09	0.81	0.75	0.26
Avail Cap(c_a), veh/h	430	690	578	175	0	672	250	2109	657	101	1759	548
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.64	0.64	0.64	0.81	0.81	0.81
Uniform Delay (d), s/veh	40.2	31.4	26.4	44.6	0.0	25.5	56.6	45.8	31.1	53.1	13.7	11.5
Incr Delay (d2), s/veh	11.8	3.2	0.3	0.4	0.0	0.2	13.7	1.8	0.2	23.9	2.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	14.1	4.6	0.9	0.0	3.9	6.5	17.7	1.7	2.8	8.9	1.8
LnGrp Delay(d),s/veh	52.0	34.6	26.7	45.1	0.0	25.7	70.3	47.7	31.3	77.0	16.2	12.5
LnGrp LOS	D	C	C	D		C	E	D	C	E	B	B
Approach Vol, veh/h		1025			198			1860			1532	
Approach Delay, s/veh		39.1			28.5			49.3			18.6	
Approach LOS		D			C			D			B	

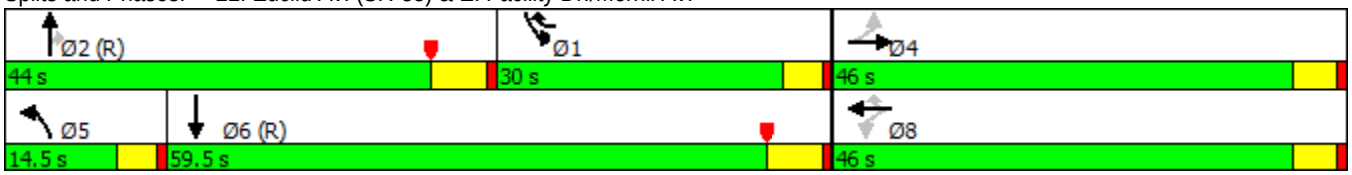
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	57.5		52.7	18.4	49.0		52.7
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	50.0		46.0	18.5	39.0		46.0
Max Q Clear Time (g_c+I1), s	7.0	40.3		45.2	14.8	21.7		33.3
Green Ext Time (p_c), s	0.0	8.9		0.5	0.1	15.1		4.9

Intersection Summary	
HCM 2010 Ctrl Delay	35.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	21	179	0	453	2	1468	343	682	1088
Future Volume (vph)	5	21	179	0	453	2	1468	343	682	1088
Turn Type	Perm	NA	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	1	5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	30.0	14.5	44.0	44.0	30.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	25.0%	12.1%	36.7%	36.7%	25.0%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		24.5		24.5	55.0	10.0	54.5	54.5	25.5	81.6
Actuated g/C Ratio		0.20		0.20	0.46	0.08	0.45	0.45	0.21	0.68
v/c Ratio		0.11		0.71	0.66	0.01	0.71	0.49	1.10	0.35
Control Delay		26.5		57.8	25.0	39.0	37.2	24.9	108.4	20.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		26.5		57.8	25.0	39.0	37.2	24.9	108.4	20.3
LOS		C		E	C	D	D	C	F	C
Approach Delay		26.5		34.3			34.9			54.3
Approach LOS		C		C			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 42.8	Intersection LOS: D
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	11	179	0	453	2	1468	343	682	1088	1
Future Volume (veh/h)	5	21	11	179	0	453	2	1468	343	682	1088	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	23	4	192	0	459	2	1578	340	733	1170	1
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	35	134	19	172	0	1124	9	1556	478	1235	3635	3
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.32	0.32	0.39	0.72	0.72
Sat Flow, veh/h	0	393	56	329	0	1530	1619	4914	1509	3141	5071	4
Grp Volume(v), veh/h	32	0	0	192	0	459	2	1578	340	733	756	415
Grp Sat Flow(s),veh/h/ln	450	0	0	329	0	1530	1619	1638	1509	1570	1638	1799
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	38.0	23.8	22.2	10.2	10.2
Cycle Q Clear(g_c), s	41.0	0.0	0.0	41.0	0.0	0.0	0.1	38.0	23.8	22.2	10.2	10.2
Prop In Lane	0.16		0.12	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	188	0	0	172	0	1124	9	1556	478	1235	2349	1290
V/C Ratio(X)	0.17	0.00	0.00	1.11	0.00	0.41	0.23	1.01	0.71	0.59	0.32	0.32
Avail Cap(c_a), veh/h	188	0	0	172	0	1124	135	1556	478	1235	2349	1290
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	0.0	46.6	0.0	6.0	59.4	41.0	36.2	28.8	6.3	6.3
Incr Delay (d2), s/veh	0.2	0.0	0.0	102.5	0.0	0.1	3.0	21.4	5.4	0.5	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	10.6	0.0	5.8	0.1	20.2	10.6	9.7	4.6	5.2
LnGrp Delay(d),s/veh	30.5	0.0	0.0	149.1	0.0	6.1	62.4	62.4	41.6	29.4	6.6	6.9
LnGrp LOS	C			F		A	E	F	D	C	A	A
Approach Vol, veh/h		32			651			1920			1904	
Approach Delay, s/veh		30.5			48.3			58.7			15.4	
Approach LOS		C			D			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	53.7	44.0		46.0	5.1	92.6		46.0
Change Period (Y+Rc), s	6.0	* 6		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	25.5	* 38		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	24.2	40.0		43.0	2.1	12.2		43.0
Green Ext Time (p_c), s	0.4	0.0		0.0	0.0	10.2		0.0

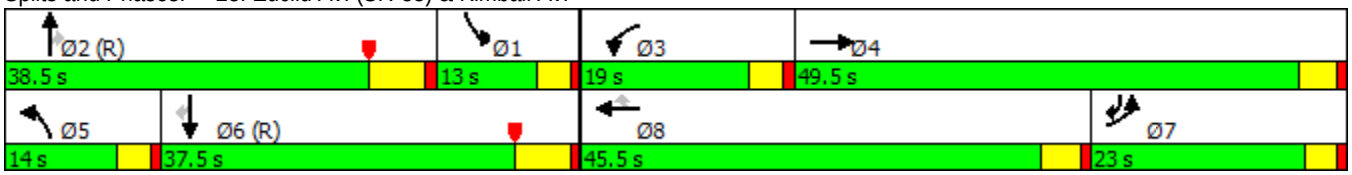
Intersection Summary	
HCM 2010 Ctrl Delay	38.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	619	798	216	373	337	124	803	157	262	869	198
Future Volume (vph)	619	798	216	373	337	124	803	157	262	869	198
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	45.5	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	23.0	49.5	19.0	45.5	45.5	14.0	38.5	38.5	13.0	37.5	23.0
Total Split (%)	19.2%	41.3%	15.8%	37.9%	37.9%	11.7%	32.1%	32.1%	10.8%	31.3%	19.2%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.5	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	34.3	43.4	15.0	24.1	24.1	11.6	28.9	28.9	14.2	31.5	67.8
Actuated g/C Ratio	0.29	0.36	0.12	0.20	0.20	0.10	0.24	0.24	0.12	0.26	0.56
v/c Ratio	0.72	0.75	1.12	0.57	0.81	0.83	0.71	0.33	0.74	0.70	0.22
Control Delay	45.4	37.6	147.0	45.2	38.1	84.8	24.2	3.0	56.2	37.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	37.6	147.0	45.2	38.1	84.8	24.2	3.0	56.2	37.1	5.8
LOS	D	D	F	D	D	F	C	A	E	D	A
Approach Delay		40.8		66.3			28.1			36.2	
Approach LOS		D		E			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 41.6	Intersection LOS: D
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	619	798	81	216	373	337	124	803	157	262	869	198
Future Volume (veh/h)	619	798	81	216	373	337	124	803	157	262	869	198
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	645	831	80	225	389	317	129	836	149	273	905	188
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	580	933	90	202	793	355	135	1008	314	638	1679	799
Arrive On Green	0.18	0.30	0.30	0.13	0.23	0.23	0.17	0.41	0.41	0.20	0.34	0.34
Sat Flow, veh/h	3141	3153	304	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	645	451	460	225	389	317	129	836	149	273	905	188
Grp Sat Flow(s),veh/h/ln	1570	1710	1746	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	22.2	30.2	30.2	15.0	11.8	24.1	9.5	18.2	6.3	9.1	17.8	2.0
Cycle Q Clear(g_c), s	22.2	30.2	30.2	15.0	11.8	24.1	9.5	18.2	6.3	9.1	17.8	2.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	580	506	517	202	793	355	135	1008	314	638	1679	799
V/C Ratio(X)	1.11	0.89	0.89	1.11	0.49	0.89	0.96	0.83	0.47	0.43	0.54	0.24
Avail Cap(c_a), veh/h	580	641	655	202	1169	523	135	1331	414	638	1679	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.41	0.41	0.41	1.00	1.00	1.00	0.73	0.73	0.73	0.95	0.95	0.95
Uniform Delay (d), s/veh	48.9	40.4	40.4	52.5	39.9	44.6	49.8	33.5	16.7	41.7	31.9	5.9
Incr Delay (d2), s/veh	60.7	5.7	5.6	96.4	0.2	9.7	52.8	5.9	3.7	0.2	1.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.5	15.1	15.4	12.1	5.6	11.1	6.2	8.8	3.0	4.0	8.2	2.0
LnGrp Delay(d),s/veh	109.6	46.1	46.0	148.9	40.1	54.4	102.6	39.4	20.4	41.9	33.1	6.6
LnGrp LOS	F	D	D	F	D	D	F	D	C	D	C	A
Approach Vol, veh/h		1556			931			1114			1366	
Approach Delay, s/veh		72.4			71.3			44.2			31.2	
Approach LOS		E			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.4	30.6	19.0	40.0	14.0	47.0	26.7	32.3
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.5	* 4.5
Max Green Setting (Gmax), s	9.0	* 33	15.0	45.0	10.0	31.5	19.0	* 41
Max Q Clear Time (g_c+I1), s	11.1	20.2	17.0	32.2	11.5	19.8	24.2	26.1
Green Ext Time (p_c), s	0.0	4.4	0.0	3.3	0.0	5.1	0.0	1.7

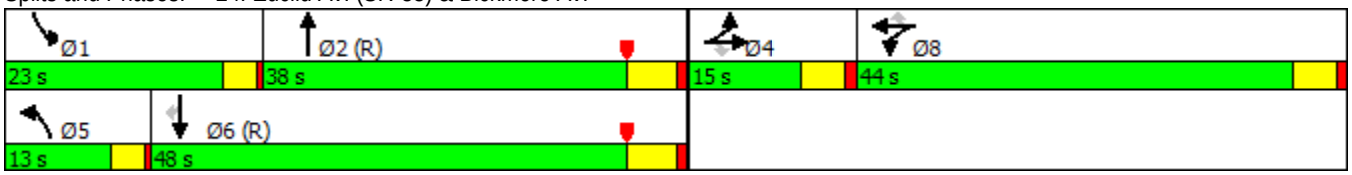
Intersection Summary	
HCM 2010 Ctrl Delay	54.5
HCM 2010 LOS	D

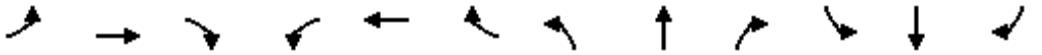
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	115	118	118	116	42	118	47	856	215	837	77
Future Volume (vph)	115	118	118	116	42	118	47	856	215	837	77
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	15.0	15.0	15.0	44.0	44.0	44.0	13.0	38.0	23.0	48.0	48.0
Total Split (%)	12.5%	12.5%	12.5%	36.7%	36.7%	36.7%	10.8%	31.7%	19.2%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	10.0	10.0	15.7	15.7	15.7	7.9	53.4	21.8	69.1	69.1
Actuated g/C Ratio	0.08	0.08	0.08	0.13	0.13	0.13	0.07	0.44	0.18	0.58	0.58
v/c Ratio	0.96	0.87	0.53	0.43	0.41	0.42	0.50	0.80	0.81	0.47	0.10
Control Delay	121.8	100.8	16.8	51.1	50.1	9.9	84.6	18.3	62.5	11.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.8	100.8	16.8	51.1	50.1	9.9	84.6	18.3	62.5	11.1	4.6
LOS	F	F	B	D	D	A	F	B	E	B	A
Approach Delay		79.5			33.2			21.1		20.4	
Approach LOS		E			C			C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 105 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 29.1	Intersection LOS: C
Intersection Capacity Utilization 71.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	118	118	116	42	118	47	856	212	215	837	77
Future Volume (veh/h)	115	118	118	116	42	118	47	856	212	215	837	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	128	131	112	88	104	119	52	951	226	239	930	86
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	150	127	158	176	150	64	1360	323	263	2123	930
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.08	1.00	1.00	0.05	0.20	0.20
Sat Flow, veh/h	1619	1800	1530	1619	1800	1530	1619	2732	648	1619	3420	1498
Grp Volume(v), veh/h	128	131	112	88	104	119	52	595	582	239	930	86
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1619	1710	1670	1619	1710	1498
Q Serve(g_s), s	9.4	8.6	8.7	6.2	6.6	9.1	3.8	0.6	0.6	17.6	28.5	5.6
Cycle Q Clear(g_c), s	9.4	8.6	8.7	6.2	6.6	9.1	3.8	0.6	0.6	17.6	28.5	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	135	150	127	158	176	150	64	852	831	263	2123	930
V/C Ratio(X)	0.95	0.87	0.88	0.56	0.59	0.79	0.81	0.70	0.70	0.91	0.44	0.09
Avail Cap(c_a), veh/h	135	150	127	526	585	497	128	852	831	263	2123	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.24	0.24	0.24	0.52	0.52	0.52
Uniform Delay (d), s/veh	54.7	54.4	54.4	51.6	51.8	53.0	54.8	0.1	0.1	55.9	29.4	20.3
Incr Delay (d2), s/veh	61.2	38.1	43.9	1.1	1.2	3.6	2.2	1.2	1.2	19.9	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	5.9	5.2	2.8	3.4	4.0	1.7	0.4	0.4	9.4	13.7	2.4
LnGrp Delay(d),s/veh	115.9	92.4	98.3	52.8	53.0	56.6	57.0	1.3	1.3	75.8	29.8	20.4
LnGrp LOS	F	F	F	D	D	E	E	A	A	E	C	C
Approach Vol, veh/h		371			311			1229			1255	
Approach Delay, s/veh		102.3			54.3			3.7			37.9	
Approach LOS		F			D			A			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	65.3		15.0	8.3	80.0		16.7
Change Period (Y+Rc), s	3.5	5.5		5.0	3.5	5.5		5.0
Max Green Setting (Gmax), s	19.5	32.5		10.0	9.5	42.5		39.0
Max Q Clear Time (g_c+I1), s	19.6	2.6		11.4	5.8	30.5		11.1
Green Ext Time (p_c), s	0.0	10.1		0.0	0.0	6.6		0.6

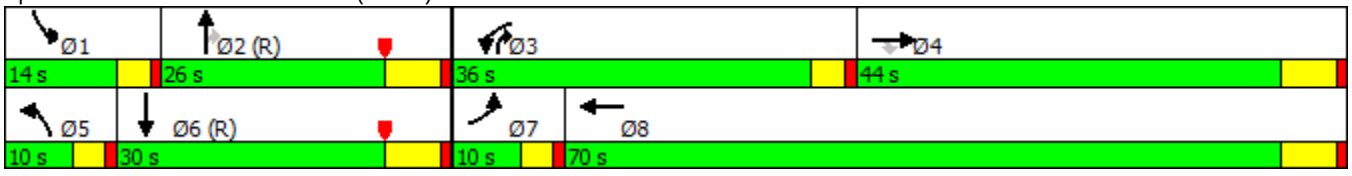
Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

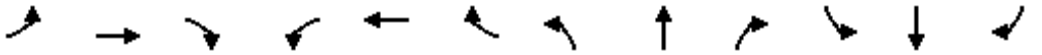
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	339	29	475	77	34	987	1074	112	908
Future Volume (vph)	15	339	29	475	77	34	987	1074	112	908
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	10.0	44.0	44.0	36.0	70.0	10.0	26.0	36.0	14.0	30.0
Total Split (%)	8.3%	36.7%	36.7%	30.0%	58.3%	8.3%	21.7%	30.0%	11.7%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.5	29.4	29.4	32.0	61.4	6.4	26.3	64.3	12.2	35.9
Actuated g/C Ratio	0.05	0.24	0.24	0.27	0.51	0.05	0.22	0.54	0.10	0.30
v/c Ratio	0.20	0.79	0.06	0.62	0.16	0.41	0.94	1.18	0.70	0.65
Control Delay	61.5	55.1	0.2	42.8	9.9	68.6	44.9	103.3	69.0	46.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	55.1	0.2	42.8	9.9	68.6	44.9	103.3	69.0	46.6
LOS	E	E	A	D	A	E	D	F	E	D
Approach Delay		51.2			35.4		75.2			49.0
Approach LOS		D			D		E			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 60.5	Intersection LOS: E
Intersection Capacity Utilization 107.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	339	29	475	77	62	34	987	1074	112	908	15
Future Volume (veh/h)	15	339	29	475	77	62	34	987	1074	112	908	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	349	0	490	79	58	35	1018	674	115	936	11
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	410	349	546	383	281	46	1658	799	135	1962	23
Arrive On Green	0.02	0.23	0.00	0.18	0.40	0.40	0.03	0.34	0.34	0.03	0.13	0.13
Sat Flow, veh/h	1619	1800	1530	2956	966	709	1619	4914	1530	1619	5005	59
Grp Volume(v), veh/h	15	349	0	490	0	137	35	1018	674	115	612	335
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1675	1619	1638	1530	1619	1638	1788
Q Serve(g_s), s	1.1	22.3	0.0	19.4	0.0	6.5	2.6	20.8	40.5	8.5	20.8	20.8
Cycle Q Clear(g_c), s	1.1	22.3	0.0	19.4	0.0	6.5	2.6	20.8	40.5	8.5	20.8	20.8
Prop In Lane	1.00		1.00	1.00		0.42	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	27	410	349	546	0	664	46	1658	799	135	1284	701
V/C Ratio(X)	0.57	0.85	0.00	0.90	0.00	0.21	0.75	0.61	0.84	0.85	0.48	0.48
Avail Cap(c_a), veh/h	81	570	484	788	0	893	81	1658	799	135	1284	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.93	0.93	0.93
Uniform Delay (d), s/veh	58.6	44.4	0.0	47.8	0.0	23.8	57.9	33.2	24.5	57.6	40.8	40.8
Incr Delay (d2), s/veh	6.8	10.1	0.0	7.5	0.0	0.2	0.8	0.2	1.1	34.3	1.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.2	0.0	8.5	0.0	3.0	1.2	9.4	19.2	5.1	9.7	10.7
LnGrp Delay(d),s/veh	65.4	54.4	0.0	55.3	0.0	24.0	58.7	33.4	25.6	91.9	42.0	43.0
LnGrp LOS	E	D		E		C	E	C	C	F	D	D
Approach Vol, veh/h		364			627			1727			1062	
Approach Delay, s/veh		54.9			48.5			30.9			47.7	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	46.5	26.2	33.3	7.4	53.0	6.0	53.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	20.0	32.0	38.0	6.0	24.0	6.0	64.0
Max Q Clear Time (g_c+I1), s	10.5	42.5	21.4	24.3	4.6	22.8	3.1	8.5
Green Ext Time (p_c), s	0.0	0.0	0.7	3.1	0.0	1.0	0.0	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	40.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	274	668	14	412	25	6	74	17
Future Volume (vph)	274	668	14	412	25	6	74	17
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	37.4	9.6	24.0	33.0	33.0	33.0	33.0
Total Split (%)	28.8%	46.8%	12.0%	30.0%	41.3%	41.3%	41.3%	41.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	16.1	34.9	5.1	15.9		26.0		26.0
Actuated g/C Ratio	0.22	0.47	0.07	0.22		0.35		0.35
v/c Ratio	0.82	0.48	0.14	0.74		0.10		0.89
Control Delay	49.4	15.3	38.4	35.1		17.9		45.9
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	49.4	15.3	38.4	35.1		17.9		45.9
LOS	D	B	D	D		B		D
Approach Delay		24.7		35.1		17.9		45.9
Approach LOS		C		D		B		D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 73.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	668	46	14	412	89	25	6	9	74	17	349
Future Volume (veh/h)	274	668	46	14	412	89	25	6	9	74	17	349
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	291	711	49	15	438	95	27	6	10	79	18	371
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	332	1330	92	29	626	135	241	58	65	127	42	415
Arrive On Green	0.21	0.41	0.41	0.02	0.22	0.22	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1619	3240	223	1619	2801	603	449	166	186	190	122	1195
Grp Volume(v), veh/h	291	375	385	15	266	267	43	0	0	468	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1753	1619	1710	1694	801	0	0	1508	0	0
Q Serve(g_s), s	12.0	11.4	11.4	0.6	9.8	10.0	0.0	0.0	0.0	14.3	0.0	0.0
Cycle Q Clear(g_c), s	12.0	11.4	11.4	0.6	9.8	10.0	1.1	0.0	0.0	20.1	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.36	0.63		0.23	0.17		0.79
Lane Grp Cap(c), veh/h	332	702	720	29	382	379	363	0	0	585	0	0
V/C Ratio(X)	0.88	0.53	0.53	0.51	0.70	0.70	0.12	0.00	0.00	0.80	0.00	0.00
Avail Cap(c_a), veh/h	434	777	796	118	443	439	441	0	0	684	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.5	15.3	15.3	33.4	24.5	24.6	15.0	0.0	0.0	21.1	0.0	0.0
Incr Delay (d2), s/veh	12.4	0.6	0.6	5.0	3.9	4.2	0.1	0.0	0.0	5.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	5.4	5.6	0.3	5.1	5.1	0.6	0.0	0.0	9.3	0.0	0.0
LnGrp Delay(d),s/veh	38.8	15.9	15.9	38.5	28.4	28.8	15.2	0.0	0.0	27.0	0.0	0.0
LnGrp LOS	D	B	B	D	C	C	B			C		
Approach Vol, veh/h		1051			548			43			468	
Approach Delay, s/veh		22.3			28.9			15.2			27.0	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	34.4		28.4	18.7	21.6		28.4
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	31.2		28.4	18.4	17.8		28.4
Max Q Clear Time (g_c+I1), s	2.6	13.4		22.1	14.0	12.0		3.1
Green Ext Time (p_c), s	0.0	6.8		1.7	0.2	3.3		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	339	366	192	154	322	201
Future Volume (vph)	339	366	192	154	322	201
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	14.0	46.8	32.8	32.8
Total Split (%)	41.5%	41.5%	17.5%	58.5%	41.0%	41.0%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	18.6	16.9	9.8	32.0	17.5	17.5
Actuated g/C Ratio	0.30	0.28	0.16	0.52	0.29	0.29
v/c Ratio	0.75	0.57	0.80	0.18	0.68	0.37
Control Delay	30.5	5.9	55.8	9.4	27.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	5.9	55.8	9.4	27.4	5.1
LOS	C	A	E	A	C	A
Approach Delay				35.1	18.8	
Approach LOS				D	B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 61.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	0	366	0	0	0	192	154	0	0	322	201
Future Volume (veh/h)	339	0	366	0	0	0	192	154	0	0	322	201
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	365	0	394				206	166	0	0	346	216
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	485	0	459				249	914	0	0	484	402
Arrive On Green	0.30	0.00	0.30				0.15	0.51	0.00	0.00	0.27	0.27
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1493
Grp Volume(v), veh/h	365	0	394				206	166	0	0	346	216
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1493
Q Serve(g_s), s	11.0	0.0	13.1				6.7	2.7	0.0	0.0	9.4	6.7
Cycle Q Clear(g_c), s	11.0	0.0	13.1				6.7	2.7	0.0	0.0	9.4	6.7
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	485	0	459				249	914	0	0	484	402
V/C Ratio(X)	0.75	0.00	0.86				0.83	0.18	0.00	0.00	0.71	0.54
Avail Cap(c_a), veh/h	857	0	810				282	1366	0	0	900	746
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	17.8				22.2	7.2	0.0	0.0	17.9	16.9
Incr Delay (d2), s/veh	0.9	0.0	1.9				14.8	0.1	0.0	0.0	2.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.0	0.2				4.0	1.4	0.0	0.0	4.9	0.1
LnGrp Delay(d),s/veh	18.0	0.0	19.7				37.0	7.3	0.0	0.0	19.8	18.0
LnGrp LOS	B		B				D	A			B	B
Approach Vol, veh/h		759						372			562	
Approach Delay, s/veh		18.9						23.8			19.1	
Approach LOS		B						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		33.2		20.8	12.9	20.3		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		41.0		28.6	9.4	27.0		
Max Q Clear Time (g_c+I1), s		4.7		15.1	8.7	11.4		
Green Ext Time (p_c), s		3.7		1.1	0.0	3.1		

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	C

APPENDIX 6.13:

OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	417	413	365	487	1035	1112	516
v/c Ratio	0.94	0.92	0.74	0.92	0.51	0.87	0.59
Control Delay	62.9	57.9	31.2	41.6	17.1	35.5	5.1
Queue Delay	49.2	50.6	0.0	0.0	0.6	0.0	0.0
Total Delay	112.1	108.5	31.2	41.6	17.7	35.5	5.1
Queue Length 50th (ft)	238	241	142	153	267	310	0
Queue Length 95th (ft)	#422	#430	#257	m#203	m327	#437	66
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	460	467	505	539	2032	1280	878
Starvation Cap Reductn	0	0	0	0	552	0	0
Spillback Cap Reductn	122	123	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	1.20	0.72	0.90	0.70	0.87	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	323	684	1148	679	318	1561
v/c Ratio	0.67	1.30	0.85	0.68	0.79	0.81
Control Delay	34.8	172.4	32.4	5.5	53.3	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	48.1
Total Delay	34.8	172.4	32.4	5.5	53.3	71.1
Queue Length 50th (ft)	167	~492	306	0	102	511
Queue Length 95th (ft)	268	#718	#397	72	m116	m578
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	485	528	1349	1003	417	1957
Starvation Cap Reductn	0	0	0	0	0	646
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	1.30	0.85	0.68	0.76	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	384	376	344	552	1108	977	566
v/c Ratio	0.94	0.90	0.76	0.86	0.53	0.79	0.63
Control Delay	64.6	56.1	34.2	37.9	17.8	32.2	5.6
Queue Delay	4.0	2.5	0.0	0.0	0.7	0.0	0.0
Total Delay	68.7	58.7	34.2	37.9	18.5	32.2	5.6
Queue Length 50th (ft)	221	213	137	174	275	267	0
Queue Length 95th (ft)	#397	#391	#271	m#220	m327	#354	76
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	426	434	465	678	2106	1236	900
Starvation Cap Reductn	0	0	0	0	600	0	0
Spillback Cap Reductn	17	17	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.90	0.74	0.81	0.74	0.79	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	353	597	1218	761	313	1277
v/c Ratio	0.85	1.34	0.79	0.70	0.84	0.61
Control Delay	52.4	197.2	25.9	5.2	57.8	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	3.7
Total Delay	52.4	197.2	25.9	5.2	57.8	17.5
Queue Length 50th (ft)	201	~447	300	0	101	252
Queue Length 95th (ft)	#363	#665	387	64	m121	m336
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	414	444	1539	1092	382	2109
Starvation Cap Reductn	0	0	0	0	0	724
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.34	0.79	0.70	0.82	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 6.14:

OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	429	423	365	491	1037	1115	516
v/c Ratio	0.95	0.92	0.73	0.92	0.52	0.89	0.59
Control Delay	64.3	58.3	30.4	42.2	17.4	37.1	5.1
Queue Delay	46.9	49.3	0.0	0.0	0.6	0.0	0.0
Total Delay	111.2	107.6	30.4	42.2	18.0	37.1	5.1
Queue Length 50th (ft)	248	249	142	154	268	311	0
Queue Length 95th (ft)	#440	#446	#257	m#204	m326	#439	66
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	460	467	505	539	2013	1258	872
Starvation Cap Reductn	0	0	0	0	553	0	0
Spillback Cap Reductn	125	126	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	1.24	0.72	0.91	0.71	0.89	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	323	701	1153	684	318	1585
v/c Ratio	0.67	1.33	0.85	0.68	0.79	0.82
Control Delay	34.8	185.8	32.7	5.6	52.4	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	48.0
Total Delay	34.8	185.8	32.7	5.6	52.4	70.8
Queue Length 50th (ft)	167	~514	308	0	102	521
Queue Length 95th (ft)	268	#742	#401	73	m113	m579
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	485	528	1349	1006	417	1957
Starvation Cap Reductn	0	0	0	0	0	646
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	1.33	0.85	0.68	0.76	1.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	381	381	349	568	1112	978	566
v/c Ratio	0.93	0.91	0.78	0.88	0.53	0.79	0.63
Control Delay	63.9	58.8	35.5	38.7	17.7	32.4	5.6
Queue Delay	4.0	3.1	0.0	0.0	0.7	0.0	0.0
Total Delay	67.9	61.9	35.5	38.7	18.4	32.4	5.6
Queue Length 50th (ft)	218	218	142	180	278	267	0
Queue Length 95th (ft)	#393	#401	#281	m#227	m328	#355	76
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	426	434	464	678	2109	1231	899
Starvation Cap Reductn	0	0	0	0	602	0	0
Spillback Cap Reductn	18	18	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.92	0.75	0.84	0.74	0.79	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	353	602	1238	782	313	1285
v/c Ratio	0.85	1.36	0.80	0.71	0.84	0.61
Control Delay	52.7	204.3	26.4	5.4	57.5	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	3.9
Total Delay	52.7	204.3	26.4	5.4	57.5	17.6
Queue Length 50th (ft)	201	~454	308	0	101	252
Queue Length 95th (ft)	#363	#672	397	66	m121	m338
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	413	442	1539	1103	382	2109
Starvation Cap Reductn	0	0	0	0	0	722
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.36	0.80	0.71	0.82	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 7.1:

OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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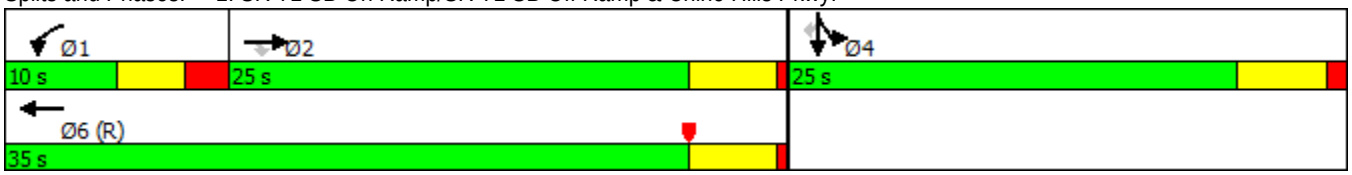
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1243	323	6	982	520	86	407
Future Volume (vph)	1243	323	6	982	520	86	407
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.44	0.37	0.04	0.58	0.61	0.57	0.71
Control Delay	11.7	3.2	27.7	9.6	22.8	21.4	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	3.2	27.7	9.6	22.8	21.4	20.8
LOS	B	A	C	A	C	C	C
Approach Delay	9.9			9.7		21.6	
Approach LOS	A			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 68.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1243	323	6	982	0	0	0	0	520	86	407
Future Volume (veh/h)	0	1243	323	6	982	0	0	0	0	520	86	407
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1281	263	6	1012	0				600	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1281	263	6	1012	0				600	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	9.1	7.3	0.2	9.5	0.0				9.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.1	7.3	0.2	9.5	0.0				9.1	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.50	0.41	0.47	0.58	0.00				0.56	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.71	0.71	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.9	12.3	29.6	6.3	0.0				16.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.4	6.8	1.0	0.0				2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	3.1	0.1	4.6	0.0				4.3	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.0	12.7	36.4	7.3	0.0				18.4	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1544			1018						600	
Approach Delay, s/veh		13.0			7.5						18.4	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	11.1		11.1		11.5		
Green Ext Time (p_c), s	0.0	8.1		1.2		15.0		

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	570	1193	605	345	383	204
Future Volume (vph)	570	1193	605	345	383	204
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	17.0	47.0	30.0	30.0	13.0	13.0
Total Split (%)	28.3%	78.3%	50.0%	50.0%	21.7%	21.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	12.0	40.5	23.5	23.5	7.0	7.0
Actuated g/C Ratio	0.20	0.68	0.39	0.39	0.12	0.12
v/c Ratio	1.02	0.54	0.48	0.54	1.20	1.13
Control Delay	70.2	6.0	15.1	11.6	164.6	114.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.2	6.0	15.1	11.6	164.6	114.4
LOS	E	A	B	B	F	F
Approach Delay		26.8	13.8			130.9
Approach LOS		C	B			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 41.8	Intersection LOS: D
Intersection Capacity Utilization 68.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	570	1193	0	0	605	345	383	204	9	0	0	0
Future Volume (veh/h)	570	1193	0	0	605	345	383	204	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	600	1256	0	0	637	362	419	192	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	591	2308	0	0	1340	590	378	203	6			
Arrive On Green	0.20	0.68	0.00	0.00	0.39	0.39	0.12	0.12	0.12			
Sat Flow, veh/h	2956	3510	0	0	3510	1505	3238	1736	54			
Grp Volume(v), veh/h	600	1256	0	0	637	362	419	0	198			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1505	1619	0	1790			
Q Serve(g_s), s	12.0	11.3	0.0	0.0	8.4	11.6	7.0	0.0	6.6			
Cycle Q Clear(g_c), s	12.0	11.3	0.0	0.0	8.4	11.6	7.0	0.0	6.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	591	2309	0	0	1340	590	378	0	209			
V/C Ratio(X)	1.01	0.54	0.00	0.00	0.48	0.61	1.11	0.00	0.95			
Avail Cap(c_a), veh/h	591	2309	0	0	1340	590	378	0	209			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.88	0.88	0.00	0.00	0.65	0.65	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.0	5.0	0.0	0.0	13.6	14.6	26.5	0.0	26.3			
Incr Delay (d2), s/veh	38.5	0.8	0.0	0.0	0.8	3.1	79.1	0.0	50.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.0	5.5	0.0	0.0	4.0	5.2	7.2	0.0	6.1			
LnGrp Delay(d),s/veh	62.5	5.8	0.0	0.0	14.4	17.7	105.6	0.0	76.3			
LnGrp LOS	F	A			B	B	F		E			
Approach Vol, veh/h		1856			999			617				
Approach Delay, s/veh		24.1			15.6			96.2				
Approach LOS		C			B			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.0			17.0	30.0		13.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		40.5			12.0	23.5		7.0
Max Q Clear Time (g_c+I1), s		13.3			14.0	13.6		9.0
Green Ext Time (p_c), s		17.4			0.0	8.0		0.0

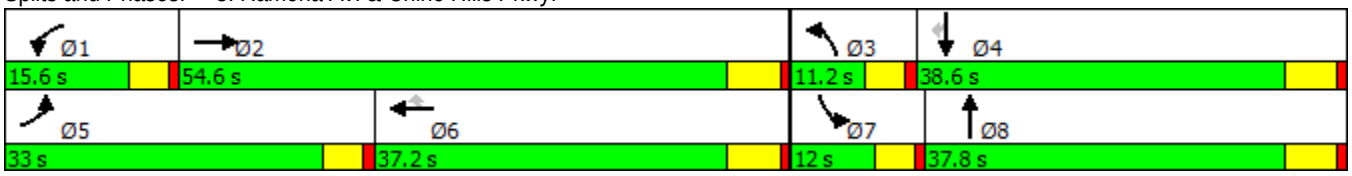
Intersection Summary	
HCM 2010 Ctrl Delay	34.5
HCM 2010 LOS	C

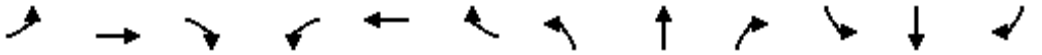
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	361	838	68	667	99	28	407	86	184	255
Future Volume (vph)	361	838	68	667	99	28	407	86	184	255
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	28.4	50.8	8.9	29.3	29.3	6.0	32.0	7.4	37.4	37.4
Actuated g/C Ratio	0.24	0.43	0.08	0.25	0.25	0.05	0.27	0.06	0.32	0.32
v/c Ratio	0.98	0.42	0.59	0.83	0.21	0.35	0.64	0.90	0.18	0.41
Control Delay	85.7	24.7	72.4	51.2	2.6	66.8	39.0	122.2	31.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.7	24.7	72.4	51.2	2.6	66.8	39.0	122.2	31.7	6.0
LOS	F	C	E	D	A	E	D	F	C	A
Approach Delay		43.0		47.2			40.3		34.1	
Approach LOS		D		D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.9	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 42.1	Intersection LOS: D
Intersection Capacity Utilization 91.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	361	838	4	68	667	99	28	407	153	86	184	255
Future Volume (veh/h)	361	838	4	68	667	99	28	407	153	86	184	255
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	380	882	3	72	702	87	29	428	93	91	194	172
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	393	2175	7	90	831	366	42	763	164	102	1062	467
Arrive On Green	0.24	0.43	0.43	0.06	0.24	0.24	0.03	0.27	0.27	0.06	0.31	0.31
Sat Flow, veh/h	1619	5055	17	1619	3420	1507	1619	2792	601	1619	3420	1504
Grp Volume(v), veh/h	380	571	314	72	702	87	29	261	260	91	194	172
Grp Sat Flow(s),veh/h/ln	1619	1638	1797	1619	1710	1507	1619	1710	1683	1619	1710	1504
Q Serve(g_s), s	27.2	14.1	14.1	5.1	22.9	5.4	2.1	15.3	15.6	6.5	4.9	10.4
Cycle Q Clear(g_c), s	27.2	14.1	14.1	5.1	22.9	5.4	2.1	15.3	15.6	6.5	4.9	10.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	393	1409	773	90	831	366	42	468	460	102	1062	467
V/C Ratio(X)	0.97	0.41	0.41	0.80	0.85	0.24	0.69	0.56	0.57	0.89	0.18	0.37
Avail Cap(c_a), veh/h	393	1409	773	152	918	404	91	468	460	102	1062	467
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.8	23.0	23.0	54.6	42.2	35.6	56.5	36.4	36.5	54.4	29.5	31.4
Incr Delay (d2), s/veh	36.5	0.3	0.5	6.2	7.2	0.5	7.1	4.7	5.0	53.9	0.4	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.1	6.4	7.1	2.5	11.7	2.3	1.0	7.9	7.9	4.5	2.3	4.6
LnGrp Delay(d),s/veh	80.4	23.3	23.5	60.8	49.4	36.1	63.6	41.2	41.5	108.3	29.9	33.6
LnGrp LOS	F	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1265			861			550			457	
Approach Delay, s/veh		40.5			49.0			42.5			46.9	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	56.1	7.7	42.1	33.0	34.2	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	7.1	16.1	4.1	12.4	29.2	24.9	8.5	17.6
Green Ext Time (p_c), s	0.0	18.0	0.0	4.5	0.0	3.5	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.1
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	854	99	28	711	111	32
Future Vol, veh/h	854	99	28	711	111	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	938	109	31	781	122	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	938	0	1390	469
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	452	-
Critical Hdwy	-	-	4.1	-	7.5	6.9
Critical Hdwy Stg 1	-	-	-	-	6.5	-
Critical Hdwy Stg 2	-	-	-	-	6.5	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	739	-	~ 104	546
Stage 1	-	-	-	-	288	-
Stage 2	-	-	-	-	562	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	739	-	~ 101	546
Mov Cap-2 Maneuver	-	-	-	-	253	-
Stage 1	-	-	-	-	288	-
Stage 2	-	-	-	-	538	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	31.5
HCM LOS			D

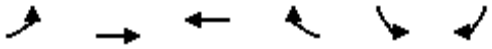
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	288	-	-	739	-
HCM Lane V/C Ratio	0.546	-	-	0.042	-
HCM Control Delay (s)	31.5	-	-	10.1	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	3	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	225	662	639	67	100
Future Volume (vph)	225	662	639	67	100
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	91.0	49.0	29.0	42.0
Total Split (%)	35.0%	75.8%	40.8%	24.2%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	17.6	48.1	25.8	23.7	42.5
Actuated g/C Ratio	0.21	0.57	0.31	0.28	0.51
v/c Ratio	0.72	0.37	0.69	0.09	0.13
Control Delay	44.3	9.6	29.4	26.9	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	9.6	29.4	26.9	4.1
LOS	D	A	C	C	A
Approach Delay		18.4	29.4	13.2	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 83.7	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	225	662	639	31	67	100
Future Volume (veh/h)	225	662	639	31	67	100
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	245	720	695	34	73	34
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	282	2010	1192	58	813	687
Arrive On Green	0.17	0.59	0.36	0.36	0.27	0.27
Sat Flow, veh/h	1619	3510	3409	162	2956	1530
Grp Volume(v), veh/h	245	720	358	371	73	34
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1771	1478	1530
Q Serve(g_s), s	12.4	9.3	14.3	14.3	1.5	1.1
Cycle Q Clear(g_c), s	12.4	9.3	14.3	14.3	1.5	1.1
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	282	2010	614	636	813	687
V/C Ratio(X)	0.87	0.36	0.58	0.58	0.09	0.05
Avail Cap(c_a), veh/h	718	3453	875	907	813	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	9.1	21.9	21.9	22.7	13.1
Incr Delay (d2), s/veh	3.2	0.2	1.3	1.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	4.3	7.0	7.2	0.7	1.3
LnGrp Delay(d),s/veh	37.2	9.2	23.2	23.1	23.0	13.2
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		965	729		107	
Approach Delay, s/veh		16.3	23.2		19.9	
Approach LOS		B	C		B	

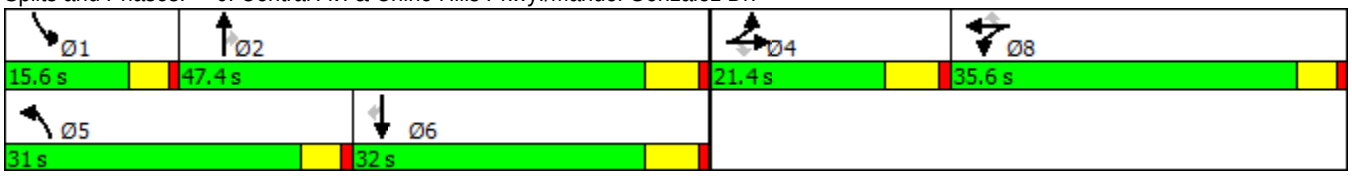
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		55.4		29.0	19.3	36.1		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	37.4	43.2		
Max Q Clear Time (g_c+I1), s		11.3		3.5	14.4	16.3		
Green Ext Time (p_c), s		19.9		0.3	0.3	14.0		

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	313	53	261	2	3	7	376	844	46	66	694	259
Future Volume (vph)	313	53	261	2	3	7	376	844	46	66	694	259
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	15.9	13.5	13.5	13.5	26.9	47.6	47.6	8.2	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.76	0.72	0.58	0.01	0.01	0.02	0.89	0.53	0.06	0.52	0.78	0.50
Control Delay	60.3	55.9	10.5	35.5	35.3	0.1	57.4	21.3	0.2	57.7	39.8	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	55.9	10.5	35.5	35.3	0.1	57.4	21.3	0.2	57.7	39.8	14.8
LOS	E	E	B	D	D	A	E	C	A	E	D	B
Approach Delay		38.2			13.7			31.3			34.6	
Approach LOS		D			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 33.9	Intersection LOS: C
Intersection Capacity Utilization 74.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	53	261	2	3	7	376	844	46	66	694	259
Future Volume (veh/h)	313	53	261	2	3	7	376	844	46	66	694	259
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	381	0	188	2	3	3	409	917	38	72	754	227
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	491	0	232	33	36	31	441	1802	789	90	1059	468
Arrive On Green	0.15	0.00	0.15	0.02	0.02	0.02	0.27	0.53	0.53	0.06	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	381	0	188	2	3	3	409	917	38	72	754	227
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	9.6	0.0	10.1	0.1	0.1	0.2	20.8	14.7	1.0	3.7	16.5	10.3
Cycle Q Clear(g_c), s	9.6	0.0	10.1	0.1	0.1	0.2	20.8	14.7	1.0	3.7	16.5	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	491	0	232	33	36	31	441	1802	789	90	1059	468
V/C Ratio(X)	0.78	0.00	0.81	0.06	0.08	0.10	0.93	0.51	0.05	0.80	0.71	0.49
Avail Cap(c_a), veh/h	597	0	282	593	660	561	505	1802	789	211	1059	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	0.0	34.7	40.6	40.7	40.7	29.9	12.9	9.7	39.5	25.8	23.7
Incr Delay (d2), s/veh	5.2	0.0	13.7	0.8	1.0	1.3	20.6	1.0	0.1	6.1	4.1	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	5.1	0.1	0.1	0.1	11.8	7.1	0.5	1.8	8.3	4.8
LnGrp Delay(d),s/veh	39.8	0.0	48.4	41.4	41.6	42.0	50.6	14.0	9.8	45.6	29.9	27.3
LnGrp LOS	D		D	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		569			8			1364			1053	
Approach Delay, s/veh		42.6			41.7			24.8			30.4	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	50.4		18.6	27.7	32.0		6.3
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.7	16.7		12.1	22.8	18.5		2.2
Green Ext Time (p_c), s	0.0	17.5		0.8	0.3	6.6		0.0

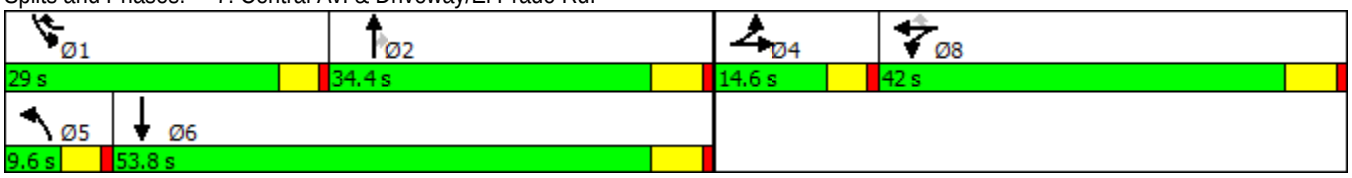
Intersection Summary	
HCM 2010 Ctrl Delay	30.2
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1048	3	510	2	783	698	400	639
Future Volume (vph)	1	1	1048	3	510	2	783	698	400	639
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	1.13	1.07	0.54	0.03	0.96	0.83	1.22	0.28
Control Delay	48.0	41.0	116.7	95.2	8.1	53.0	61.9	12.7	158.5	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	116.7	95.2	8.1	53.0	61.9	12.7	158.5	16.4
LOS	D	D	F	F	A	D	E	B	F	B
Approach Delay		43.3		74.0			38.7			70.5
Approach LOS		D		E			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 60.3	Intersection LOS: E
Intersection Capacity Utilization 100.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1048	3	510	2	783	698	400	639	10
Future Volume (veh/h)	1	1	1	1048	3	510	2	783	698	400	639	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1166	0	424	2	870	607	444	710	9
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1057	0	836	4	882	390	356	2377	30
Arrive On Green	0.01	0.01	0.01	0.33	0.00	0.33	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5001	63
Grp Volume(v), veh/h	1	0	2	1166	0	424	2	870	607	444	465	254
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	36.2	0.0	19.3	0.1	28.1	28.6	24.4	9.6	9.6
Cycle Q Clear(g_c), s	0.1	0.0	0.1	36.2	0.0	19.3	0.1	28.1	28.6	24.4	9.6	9.6
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	13	0	13	1057	0	836	4	882	390	356	1557	850
V/C Ratio(X)	0.08	0.00	0.15	1.10	0.00	0.51	0.46	0.99	1.56	1.25	0.30	0.30
Avail Cap(c_a), veh/h	146	0	149	1057	0	836	73	882	390	356	1557	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	37.3	0.0	15.8	55.2	40.9	41.1	43.2	17.8	17.8
Incr Delay (d2), s/veh	0.9	0.0	2.0	60.3	0.0	0.5	25.4	27.2	263.5	132.2	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	24.9	0.0	8.2	0.1	16.5	40.3	23.9	4.4	4.9
LnGrp Delay(d),s/veh	55.5	0.0	56.6	97.7	0.0	16.3	80.6	68.1	304.6	175.5	18.3	18.7
LnGrp LOS	E		E	F		B	F	E	F	F	B	B
Approach Vol, veh/h		3			1590			1479			1163	
Approach Delay, s/veh		56.2			76.0			165.2			78.4	
Approach LOS		E			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		42.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	11.6		38.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	24.5		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		107.8
HCM 2010 LOS		F

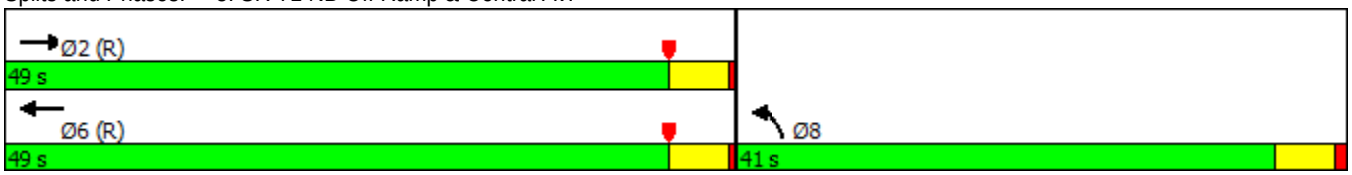
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1196	894	103
Future Volume (vph)	1196	894	103
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	49.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	57.8	57.8	22.7
Actuated g/C Ratio	0.64	0.64	0.25
v/c Ratio	0.89dr	0.34	1.20dr
Control Delay	9.2	8.3	38.2
Queue Delay	0.0	0.0	0.0
Total Delay	9.2	8.3	38.2
LOS	A	A	D
Approach Delay	9.2	8.3	38.2
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1196	810	0	894	103	386
Future Volume (veh/h)	1196	810	0	894	103	386
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1441	976	0	1077	124	272
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2271	1061	0	3406	326	308
Arrive On Green	1.00	1.00	0.00	0.69	0.20	0.20
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1441	976	0	1077	124	272
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	7.8	6.0	15.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.8	6.0	15.5
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2271	1061	0	3406	326	308
V/C Ratio(X)	0.63	0.92	0.00	0.32	0.38	0.88
Avail Cap(c_a), veh/h	2271	1061	0	3406	648	612
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.4	31.1	34.9
Incr Delay (d2), s/veh	1.4	14.1	0.0	0.2	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.1	0.0	3.6	2.7	6.9
LnGrp Delay(d),s/veh	1.4	14.1	0.0	5.7	31.4	38.3
LnGrp LOS	A	B		A	C	D
Approach Vol, veh/h	2417			1077	396	
Approach Delay, s/veh	6.5			5.7	36.1	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		66.9				66.9		23.1
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		36.0
Max Q Clear Time (g_c+I1), s		2.0				9.8		17.5
Green Ext Time (p_c), s		29.4				25.5		0.6

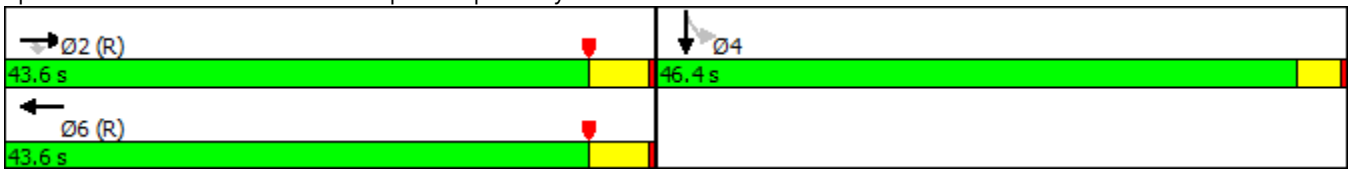
Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1412	73	793	595	0
Future Volume (vph)	1412	73	793	595	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	41.6	41.6	41.6	40.4	40.4
Actuated g/C Ratio	0.46	0.46	0.46	0.45	0.45
v/c Ratio	0.79	0.12	0.56	0.92	0.84
Control Delay	24.3	4.0	13.0	43.3	31.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	4.0	13.0	43.3	31.7
LOS	C	A	B	D	C
Approach Delay	23.3		13.0		37.7
Approach LOS	C		B		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 24.3	Intersection LOS: C
Intersection Capacity Utilization 65.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1412	73	0	793	204	0	0	0	595	0	365
Future Volume (veh/h)	0	1412	73	0	793	204	0	0	0	595	0	365
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1787	0	0	1004	258				537	302	321
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2470	769	0	1960	503				661	327	347
Arrive On Green	0.00	0.50	0.00	0.00	1.00	1.00				0.41	0.41	0.41
Sat Flow, veh/h	0	5076	1530	0	4061	1000				1619	800	850
Grp Volume(v), veh/h	0	1787	0	0	843	419				537	0	623
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1623				1619	0	1650
Q Serve(g_s), s	0.0	25.6	0.0	0.0	0.0	0.0				26.4	0.0	32.3
Cycle Q Clear(g_c), s	0.0	25.6	0.0	0.0	0.0	0.0				26.4	0.0	32.3
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.52
Lane Grp Cap(c), veh/h	0	2470	769	0	1647	816				661	0	674
V/C Ratio(X)	0.00	0.72	0.00	0.00	0.51	0.51				0.81	0.00	0.92
Avail Cap(c_a), veh/h	0	2470	769	0	1647	816				772	0	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.5	0.0	0.0	0.0	0.0				23.6	0.0	25.3
Incr Delay (d2), s/veh	0.0	1.9	0.0	0.0	1.1	2.3				4.9	0.0	14.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.8	0.0	0.0	0.3	0.5				12.7	0.0	17.4
LnGrp Delay(d),s/veh	0.0	19.4	0.0	0.0	1.1	2.3				28.5	0.0	39.6
LnGrp LOS		B			A	A				C		D
Approach Vol, veh/h		1787			1262						1160	
Approach Delay, s/veh		19.4			1.5						34.4	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		49.7		40.3		49.7		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		27.6		34.3		2.0		
Green Ext Time (p_c), s		10.1		2.5		26.0		

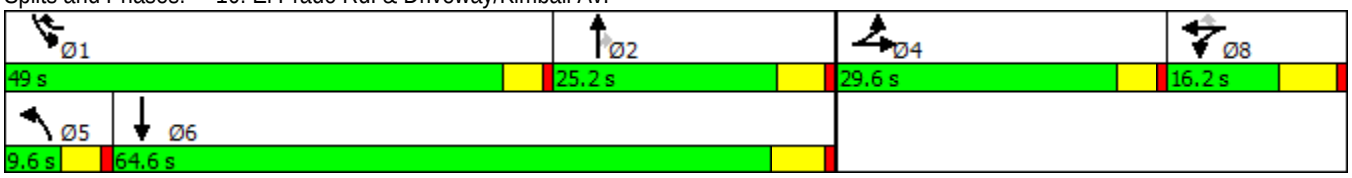
Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	1	27	1275	5	288	32	743	209
Future Volume (vph)	12	1	27	1275	5	288	32	743	209
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	58.0	5.1	20.2	20.2	45.6	60.1
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.21	0.21	0.48	0.63
v/c Ratio	0.06	0.01	0.31	1.11	0.06	0.78	0.07	0.98	0.12
Control Delay	40.2	30.3	50.0	75.7	52.6	54.0	0.3	57.9	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.3	50.0	75.7	52.6	54.0	0.3	57.9	9.3
LOS	D	C	D	E	D	D	A	E	A
Approach Delay		38.2	74.6			48.6			45.6
Approach LOS		D	E			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 60.4	Intersection LOS: E
Intersection Capacity Utilization 119.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	2	29	27	1275	5	288	32	743	209	44
Future Volume (veh/h)	12	1	2	29	27	1275	5	288	32	743	209	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	1	1	30	28	440	5	294	33	758	213	45
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	52	27	27	94	87	859	84	338	287	742	1676	347
Arrive On Green	0.03	0.03	0.03	0.10	0.10	0.10	0.05	0.19	0.19	0.46	0.59	0.59
Sat Flow, veh/h	1619	827	827	908	847	1530	1619	1800	1530	1619	2821	585
Grp Volume(v), veh/h	12	0	2	58	0	440	5	294	33	758	127	131
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1696
Q Serve(g_s), s	0.7	0.0	0.1	3.0	0.0	10.0	0.3	15.4	1.7	44.4	3.2	3.3
Cycle Q Clear(g_c), s	0.7	0.0	0.1	3.0	0.0	10.0	0.3	15.4	1.7	44.4	3.2	3.3
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	52	0	54	181	0	859	84	338	287	742	1016	1008
V/C Ratio(X)	0.23	0.00	0.04	0.32	0.00	0.51	0.06	0.87	0.11	1.02	0.13	0.13
Avail Cap(c_a), veh/h	418	0	427	181	0	859	84	371	316	742	1037	1029
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	0.0	45.4	40.3	0.0	13.1	43.7	38.2	32.7	26.3	8.6	8.6
Incr Delay (d2), s/veh	2.2	0.0	0.3	1.0	0.0	0.5	0.1	18.3	0.2	38.8	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	1.5	0.0	7.3	0.1	9.3	0.7	27.8	1.5	1.5
LnGrp Delay(d),s/veh	47.9	0.0	45.7	41.3	0.0	13.6	43.8	56.5	32.9	65.1	8.7	8.7
LnGrp LOS	D		D	D		B	D	E	C	F	A	A
Approach Vol, veh/h		14			498			332			1016	
Approach Delay, s/veh		47.6			16.8			53.9			50.8	
Approach LOS		D			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	49.0	24.0		7.7	9.6	63.4		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	46.4	17.4		2.7	2.3	5.3		12.0
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	3.4		0.0

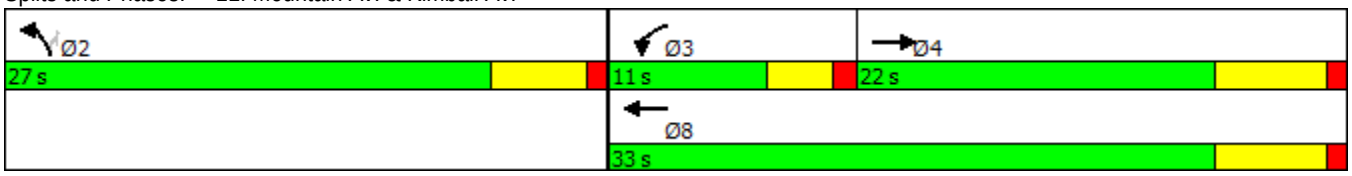
Intersection Summary	
HCM 2010 Ctrl Delay	42.2
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	664	133	1099	277	51
Future Volume (vph)	664	133	1099	277	51
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	15.1	7.4	23.2	12.9	12.9
Actuated g/C Ratio	0.31	0.15	0.48	0.27	0.27
v/c Ratio	0.77	0.56	0.69	0.67	0.12
Control Delay	22.8	35.1	12.7	24.8	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	35.1	12.7	24.8	5.5
LOS	C	D	B	C	A
Approach Delay	22.8		15.1	21.8	
Approach LOS	C		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 48.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	664	129	133	1099	277	51
Future Volume (veh/h)	664	129	133	1099	277	51
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	692	129	139	1145	289	48
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	910	169	207	1819	355	335
Arrive On Green	0.32	0.32	0.13	0.53	0.22	0.22
Sat Flow, veh/h	2969	536	1619	3510	1619	1530
Grp Volume(v), veh/h	411	410	139	1145	289	48
Grp Sat Flow(s),veh/h/ln	1710	1705	1619	1710	1619	1530
Q Serve(g_s), s	9.8	9.8	3.7	10.7	7.7	1.1
Cycle Q Clear(g_c), s	9.8	9.8	3.7	10.7	7.7	1.1
Prop In Lane		0.31	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	540	539	207	1819	355	335
V/C Ratio(X)	0.76	0.76	0.67	0.63	0.81	0.14
Avail Cap(c_a), veh/h	603	602	250	2036	775	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	14.0	18.9	7.5	16.8	14.3
Incr Delay (d2), s/veh	4.2	4.2	3.2	0.3	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.2	1.8	5.0	3.5	0.5
LnGrp Delay(d),s/veh	18.2	18.2	22.1	7.8	18.6	14.3
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	821			1284	337	
Approach Delay, s/veh	18.2			9.3	18.0	
Approach LOS	B			A	B	

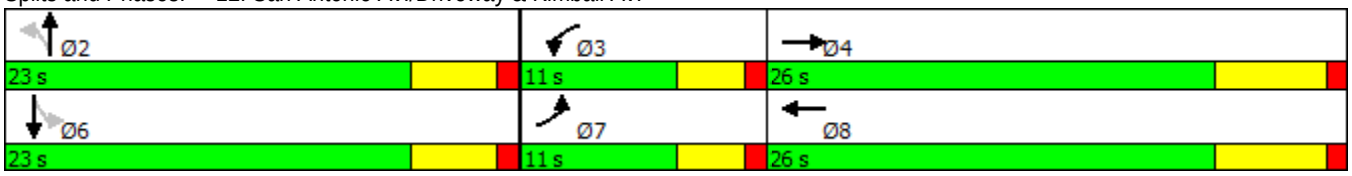
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		15.2	9.8	20.3				30.1
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		9.7	5.7	11.8				12.7
Green Ext Time (p_c), s		0.2	0.0	2.5				5.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	596	37	1236	64	0	46	0
Future Volume (vph)	38	596	37	1236	64	0	46	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	26.0	11.0	26.0	23.0	23.0	23.0	23.0
Total Split (%)	18.3%	43.3%	18.3%	43.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.3	20.7	7.3	20.7	9.0	9.0	9.0	9.0
Actuated g/C Ratio	0.16	0.46	0.16	0.46	0.20	0.20	0.20	0.20
v/c Ratio	0.15	0.45	0.15	0.84	0.26	0.03	0.19	0.01
Control Delay	21.7	11.1	21.6	21.6	18.9	0.1	17.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	11.1	21.6	21.6	18.9	0.1	17.9	0.0
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.6		21.6		15.3		16.2
Approach LOS		B		C		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44.7	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 56.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	596	65	37	1236	18	64	0	15	46	0	5
Future Volume (veh/h)	38	596	65	37	1236	18	64	0	15	46	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	40	634	69	39	1315	19	68	0	13	49	0	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1354	147	98	1501	22	380	0	246	372	0	246
Arrive On Green	0.06	0.44	0.44	0.06	0.43	0.43	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	1619	3105	337	1619	3451	50	1354	0	1530	1344	0	1530
Grp Volume(v), veh/h	40	349	354	39	651	683	68	0	13	49	0	5
Grp Sat Flow(s),veh/h/ln	1619	1710	1732	1619	1710	1791	1354	0	1530	1344	0	1530
Q Serve(g_s), s	1.0	6.3	6.3	1.0	15.1	15.1	1.9	0.0	0.3	1.4	0.0	0.1
Cycle Q Clear(g_c), s	1.0	6.3	6.3	1.0	15.1	15.1	2.1	0.0	0.3	1.7	0.0	0.1
Prop In Lane	1.00		0.19	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	746	755	98	744	779	380	0	246	372	0	246
V/C Ratio(X)	0.40	0.47	0.47	0.40	0.88	0.88	0.18	0.00	0.05	0.13	0.00	0.02
Avail Cap(c_a), veh/h	260	786	796	260	786	823	725	0	637	715	0	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.6	8.7	8.7	19.7	11.2	11.2	16.2	0.0	15.4	16.2	0.0	15.4
Incr Delay (d2), s/veh	1.0	0.2	0.2	1.0	9.9	9.6	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.9	3.0	0.5	9.1	9.5	0.7	0.0	0.1	0.5	0.0	0.1
LnGrp Delay(d),s/veh	20.6	8.9	8.9	20.6	21.1	20.8	16.3	0.0	15.5	16.2	0.0	15.4
LnGrp LOS	C	A	A	C	C	C	B		B	B		B
Approach Vol, veh/h		743			1373			81			54	
Approach Delay, s/veh		9.5			20.9			16.2			16.1	
Approach LOS		A			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.6	25.0		11.9	6.7	24.9
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		4.1	3.0	8.3		3.7	3.0	17.1
Green Ext Time (p_c), s		0.1	0.0	4.7		0.1	0.0	1.8

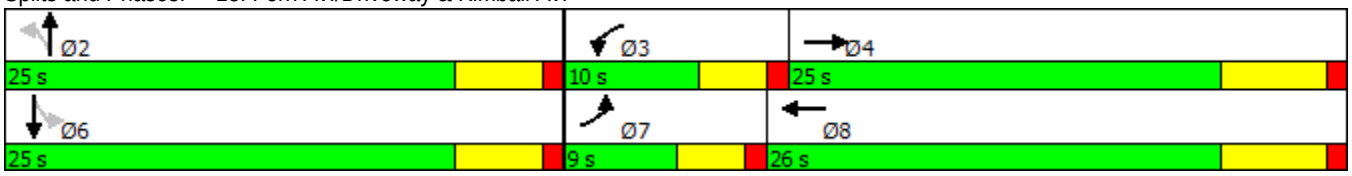
Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	37	542	39	1284	46	0	65	1
Future Volume (vph)	37	542	39	1284	46	0	65	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	20.8	5.5	21.2	8.1	8.1	8.1	8.1
Actuated g/C Ratio	0.12	0.48	0.13	0.49	0.19	0.19	0.19	0.19
v/c Ratio	0.21	0.42	0.21	0.87	0.21	0.05	0.31	0.03
Control Delay	24.4	10.5	23.4	22.4	17.4	0.2	19.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	10.5	23.4	22.4	17.4	0.2	19.0	9.6
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.3		22.4		11.1		17.8
Approach LOS		B		C		B		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 43.3
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 18.5 — Intersection LOS: B
Intersection Capacity Utilization 57.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	542	67	39	1284	20	46	0	26	65	1	8
Future Volume (veh/h)	37	542	67	39	1284	20	46	0	26	65	1	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	41	602	67	43	1427	22	51	0	19	72	1	8
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	74	1456	162	77	1627	25	336	0	188	327	21	170
Arrive On Green	0.05	0.47	0.47	0.05	0.47	0.47	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1619	3097	344	1619	3447	53	1349	0	1530	1337	173	1383
Grp Volume(v), veh/h	41	332	337	43	707	742	51	0	19	72	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1731	1619	1710	1791	1349	0	1530	1337	0	1556
Q Serve(g_s), s	1.0	5.2	5.2	1.1	15.1	15.2	1.4	0.0	0.4	2.1	0.0	0.2
Cycle Q Clear(g_c), s	1.0	5.2	5.2	1.1	15.1	15.2	1.6	0.0	0.4	2.5	0.0	0.2
Prop In Lane	1.00		0.20	1.00		0.03	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	74	804	814	77	807	845	336	0	188	327	0	192
V/C Ratio(X)	0.56	0.41	0.41	0.56	0.88	0.88	0.15	0.00	0.10	0.22	0.00	0.05
Avail Cap(c_a), veh/h	199	813	822	239	855	895	838	0	757	824	0	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.0	7.1	7.1	18.9	9.7	9.7	16.4	0.0	15.8	16.9	0.0	15.7
Incr Delay (d2), s/veh	2.4	0.1	0.1	2.4	9.3	9.0	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.4	2.5	0.5	9.0	9.3	0.5	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	21.4	7.2	7.2	21.3	18.9	18.7	16.5	0.0	15.9	17.0	0.0	15.7
LnGrp LOS	C	A	A	C	B	B	B		B	B		B
Approach Vol, veh/h		710			1492			70			81	
Approach Delay, s/veh		8.0			18.9			16.3			16.9	
Approach LOS		A			B			B			B	

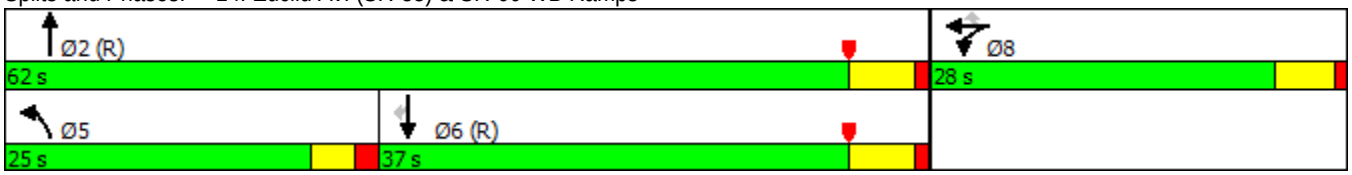
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	5.9	24.8		9.9	5.9	24.9
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.6	3.1	7.2		4.5	3.0	17.2
Green Ext Time (p_c), s		0.1	0.0	5.0		0.1	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	744	2	386	459	982	1054	489
Future Volume (vph)	744	2	386	459	982	1054	489
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.0	23.0	23.0	20.5	56.5	31.5	31.5
Actuated g/C Ratio	0.26	0.26	0.26	0.23	0.63	0.35	0.35
v/c Ratio	1.08	1.05	0.82	1.35	0.49	0.95	0.62
Control Delay	103.3	93.8	38.3	187.4	21.9	45.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	2.8	1.4	0.0
Total Delay	103.3	93.8	38.3	187.4	24.7	46.9	5.7
LOS	F	F	D	F	C	D	A
Approach Delay		80.1			76.5	33.8	
Approach LOS		F			E	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.35	
Intersection Signal Delay: 61.5	Intersection LOS: E
Intersection Capacity Utilization 136.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	744	2	386	459	982	0	0	1054	489
Future Volume (veh/h)	0	0	0	744	2	386	459	982	0	0	1054	489
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				882	0	174	494	1056	0	0	1133	526
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				828	0	391	369	2147	0	0	1197	515
Arrive On Green				0.26	0.00	0.26	0.46	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1473
Grp Volume(v), veh/h				882	0	174	494	1056	0	0	1133	526
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1473
Q Serve(g_s), s				23.0	0.0	8.6	20.5	0.0	0.0	0.0	29.0	31.5
Cycle Q Clear(g_c), s				23.0	0.0	8.6	20.5	0.0	0.0	0.0	29.0	31.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				828	0	391	369	2147	0	0	1197	515
V/C Ratio(X)				1.07	0.00	0.45	1.34	0.49	0.00	0.00	0.95	1.02
Avail Cap(c_a), veh/h				828	0	391	369	2147	0	0	1197	515
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.24	0.24	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.5	0.0	28.1	24.5	0.0	0.0	0.0	28.4	29.3
Incr Delay (d2), s/veh				50.4	0.0	0.3	157.2	0.2	0.0	0.0	16.0	44.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.0	0.0	3.7	25.1	0.1	0.0	0.0	16.2	19.2
LnGrp Delay(d),s/veh				83.9	0.0	28.4	181.7	0.2	0.0	0.0	44.4	74.2
LnGrp LOS				F		C	F	A			D	F
Approach Vol, veh/h					1056			1550			1659	
Approach Delay, s/veh					74.7			58.0			53.9	
Approach LOS					E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			25.0	37.0		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			22.5	33.5		25.0
Green Ext Time (p_c), s		43.2			0.0	0.0		0.0

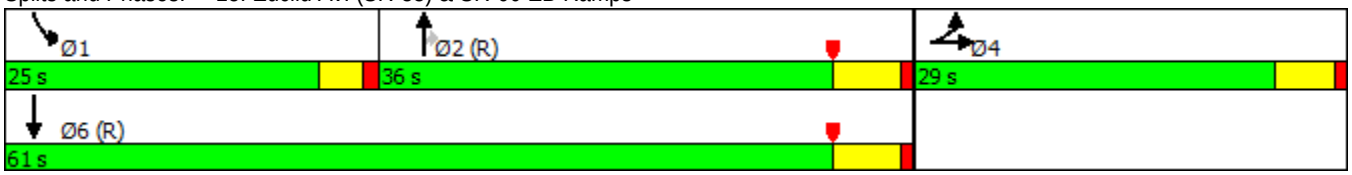
Intersection Summary	
HCM 2010 Ctrl Delay	60.5
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	344	0	1097	649	305	1493
Future Volume (vph)	344	0	1097	649	305	1493
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	31.5	31.5	20.0	55.5
Actuated g/C Ratio	0.27	0.27	0.35	0.35	0.22	0.62
v/c Ratio	0.80	1.54	0.97	0.73	0.91	0.75
Control Delay	47.7	280.1	50.9	7.6	48.6	5.9
Queue Delay	7.0	1.0	0.0	0.0	0.0	3.4
Total Delay	54.7	281.1	50.9	7.6	48.6	9.3
LOS	D	F	D	A	D	A
Approach Delay		208.1	34.8			15.9
Approach LOS		F	C			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.54	
Intersection Signal Delay: 64.2	Intersection LOS: E
Intersection Capacity Utilization 136.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	0	615	0	0	0	0	1097	649	305	1493	0
Future Volume (veh/h)	344	0	615	0	0	0	0	1097	649	305	1493	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	366	0	571				0	1167	690	324	1588	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	432	0	408				0	1214	540	352	2109	0
Arrive On Green	0.27	0.00	0.27				0.00	0.36	0.36	0.29	0.82	0.00
Sat Flow, veh/h	1619	0	1530				0	3510	1521	1619	3510	0
Grp Volume(v), veh/h	366	0	571				0	1167	690	324	1588	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1521	1619	1710	0
Q Serve(g_s), s	19.3	0.0	24.0				0.0	30.1	32.0	17.5	19.7	0.0
Cycle Q Clear(g_c), s	19.3	0.0	24.0				0.0	30.1	32.0	17.5	19.7	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	408				0	1214	540	352	2109	0
V/C Ratio(X)	0.85	0.00	1.40				0.00	0.96	1.28	0.92	0.75	0.00
Avail Cap(c_a), veh/h	432	0	408				0	1214	540	378	2109	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.71	0.71	0.13	0.13	0.00
Uniform Delay (d), s/veh	31.3	0.0	33.0				0.0	28.4	29.0	31.3	4.9	0.0
Incr Delay (d2), s/veh	13.9	0.0	194.1				0.0	14.3	134.9	5.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	0.0	32.1				0.0	16.5	33.6	8.2	8.8	0.0
LnGrp Delay(d),s/veh	45.2	0.0	227.1				0.0	42.8	163.9	36.3	5.2	0.0
LnGrp LOS	D		F					D	F	D	A	
Approach Vol, veh/h		937						1857			1912	
Approach Delay, s/veh		156.0						87.8			10.5	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.5	37.5		29.0		61.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	19.5	34.0		26.0		21.7		
Green Ext Time (p_c), s	0.1	0.0		0.0		32.3		

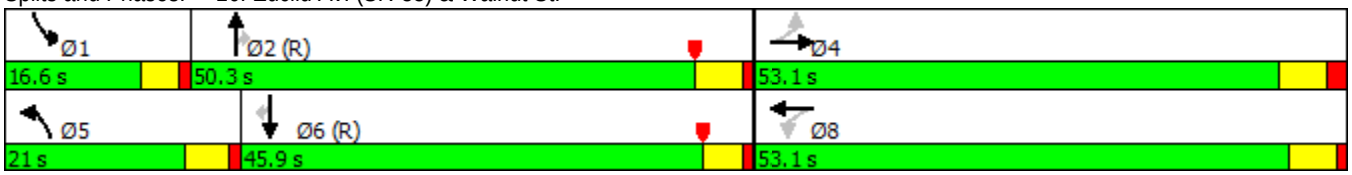
Intersection Summary		
HCM 2010 Ctrl Delay		70.0
HCM 2010 LOS		E

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	155	345	90	319	117	1390	54	163	1659	59
Future Volume (vph)	155	345	90	319	117	1390	54	163	1659	59
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	34.0	34.0	35.0	35.0	13.6	59.1	59.1	10.8	56.7	56.7
Actuated g/C Ratio	0.28	0.28	0.29	0.29	0.11	0.49	0.49	0.09	0.47	0.47
v/c Ratio	1.05	0.50	0.51	0.52	0.68	0.60	0.07	0.65	0.75	0.08
Control Delay	126.5	33.0	42.7	28.3	56.7	23.6	5.8	64.5	31.1	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.5	33.0	42.7	28.3	56.7	23.6	5.8	64.5	31.1	5.2
LOS	F	C	D	C	E	C	A	E	C	A
Approach Delay		56.8		30.5		25.5			33.2	
Approach LOS		E		C		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 33.4	Intersection LOS: C
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	345	109	90	319	178	117	1390	54	163	1659	59
Future Volume (veh/h)	155	345	109	90	319	178	117	1390	54	163	1659	59
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	163	363	93	95	336	154	123	1463	38	172	1746	33
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	262	941	238	280	794	357	148	2180	679	220	2078	646
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.03	0.15	0.15	0.07	0.42	0.42
Sat Flow, veh/h	869	2704	684	897	2283	1025	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	163	228	228	95	250	240	123	1463	38	172	1746	33
Grp Sat Flow(s),veh/h/ln	869	1710	1679	897	1710	1598	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	21.3	12.0	12.3	10.7	13.4	13.8	9.1	33.8	2.6	6.9	38.2	1.5
Cycle Q Clear(g_c), s	35.1	12.0	12.3	23.0	13.4	13.8	9.1	33.8	2.6	6.9	38.2	1.5
Prop In Lane	1.00		0.41	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	595	584	280	595	556	148	2180	679	220	2078	646
V/C Ratio(X)	0.62	0.38	0.39	0.34	0.42	0.43	0.83	0.67	0.06	0.78	0.84	0.05
Avail Cap(c_a), veh/h	299	667	655	325	681	637	217	2180	679	298	2078	646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.43	0.43	0.43	0.57	0.57	0.57
Uniform Delay (d), s/veh	43.5	29.4	29.5	38.2	29.9	30.0	57.3	42.9	29.6	54.6	31.0	20.4
Incr Delay (d2), s/veh	3.2	0.4	0.4	0.7	0.5	0.5	7.4	0.7	0.1	3.6	2.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	5.8	5.8	2.7	6.4	6.2	4.4	15.5	1.1	2.9	17.6	0.7
LnGrp Delay(d),s/veh	46.7	29.8	29.9	38.9	30.3	30.6	64.6	43.6	29.7	58.2	33.5	20.5
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	C	C
Approach Vol, veh/h		619			585			1624			1951	
Approach Delay, s/veh		34.3			31.8			44.9			35.5	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.4	58.5		48.1	15.9	56.1		48.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	8.9	35.8		37.1	11.1	40.2		25.0
Green Ext Time (p_c), s	0.1	8.4		4.6	0.1	1.2		7.2

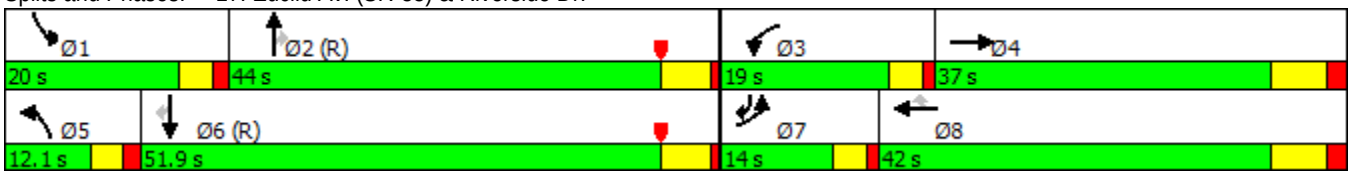
Intersection Summary		
HCM 2010 Ctrl Delay		38.1
HCM 2010 LOS		D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	148	337	179	396	52	65	983	175	186	1064	153
Future Volume (vph)	148	337	179	396	52	65	983	175	186	1064	153
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	37.0	19.0	42.0	42.0	12.1	44.0	44.0	20.0	51.9	14.0
Total Split (%)	11.7%	30.8%	15.8%	35.0%	35.0%	10.1%	36.7%	36.7%	16.7%	43.3%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.3	21.6	14.9	25.2	25.2	9.7	42.7	42.7	19.8	54.9	71.8
Actuated g/C Ratio	0.09	0.18	0.12	0.21	0.21	0.08	0.36	0.36	0.16	0.46	0.60
v/c Ratio	1.03	0.67	0.94	0.58	0.13	0.52	0.85	0.28	0.74	0.72	0.16
Control Delay	134.1	49.6	102.0	45.2	0.6	86.8	29.0	3.0	81.4	10.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	134.1	49.6	102.0	45.2	0.6	86.8	29.0	3.0	81.4	10.9	0.3
LOS	F	D	F	D	A	F	C	A	F	B	A
Approach Delay		72.8		57.7			28.4			19.1	
Approach LOS		E		E			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 36.1	Intersection LOS: D
Intersection Capacity Utilization 80.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	337	54	179	396	52	65	983	175	186	1064	153
Future Volume (veh/h)	148	337	54	179	396	52	65	983	175	186	1064	153
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	156	355	34	188	417	50	68	1035	103	196	1120	95
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	543	52	202	732	327	84	1363	610	209	1626	855
Arrive On Green	0.08	0.17	0.17	0.13	0.21	0.21	0.07	0.53	0.53	0.26	0.95	0.95
Sat Flow, veh/h	1619	3152	300	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	156	192	197	188	417	50	68	1035	103	196	1120	95
Grp Sat Flow(s),veh/h/ln	1619	1710	1742	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	10.0	12.5	12.7	13.8	13.1	3.2	5.0	28.6	4.2	14.2	5.6	0.4
Cycle Q Clear(g_c), s	10.0	12.5	12.7	13.8	13.1	3.2	5.0	28.6	4.2	14.2	5.6	0.4
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	295	300	202	732	327	84	1363	610	209	1626	855
V/C Ratio(X)	1.16	0.65	0.66	0.93	0.57	0.15	0.81	0.76	0.17	0.94	0.69	0.11
Avail Cap(c_a), veh/h	135	428	435	202	998	446	103	1363	610	209	1626	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.68	0.68	0.68	0.59	0.59	0.59
Uniform Delay (d), s/veh	55.0	46.3	46.3	52.0	42.2	38.3	55.2	23.7	17.9	44.0	1.7	1.1
Incr Delay (d2), s/veh	125.6	3.4	3.5	43.1	1.0	0.3	22.6	2.8	0.4	32.2	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	6.2	6.4	8.6	6.3	1.4	2.7	13.9	1.8	8.2	2.2	0.2
LnGrp Delay(d),s/veh	180.6	49.7	49.8	95.0	43.2	38.6	77.8	26.4	18.4	76.2	3.1	1.3
LnGrp LOS	F	D	D	F	D	D	E	C	B	E	A	A
Approach Vol, veh/h		545			655			1206			1411	
Approach Delay, s/veh		87.2			57.7			28.7			13.1	
Approach LOS		F			E			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	53.3	19.0	27.7	10.8	62.6	14.0	32.7
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	38.5	15.0	30.0	7.6	46.4	10.0	35.0
Max Q Clear Time (g_c+I1), s	16.2	30.6	15.8	14.7	7.0	7.6	12.0	15.1
Green Ext Time (p_c), s	0.0	6.6	0.0	5.8	0.0	22.0	0.0	6.6

Intersection Summary	
HCM 2010 Ctrl Delay	36.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	103	126	65	64	164	70	1354	140	30	1659	100
Future Volume (vph)	103	126	65	64	164	70	1354	140	30	1659	100
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.4	26.4	26.4		26.4	9.9	73.7	73.7	7.0	69.1	69.1
Actuated g/C Ratio	0.22	0.22	0.22		0.22	0.08	0.61	0.61	0.06	0.58	0.58
v/c Ratio	0.68	0.34	0.17		0.82	0.56	0.68	0.15	0.34	0.89	0.12
Control Delay	62.6	40.2	4.2		62.3	66.0	18.5	4.3	49.7	44.5	13.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	40.2	4.2		62.3	66.0	18.5	4.3	49.7	44.5	13.4
LOS	E	D	A		E	E	B	A	D	D	B
Approach Delay		40.1			62.3		19.4			42.9	
Approach LOS		D			E		B			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 34.6	Intersection LOS: C
Intersection Capacity Utilization 95.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	126	65	64	164	37	70	1354	140	30	1659	100
Future Volume (veh/h)	103	126	65	64	164	37	70	1354	140	30	1659	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	108	133	44	67	173	35	74	1425	111	32	1746	76
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	203	413	346	102	226	42	91	2072	927	44	1973	882
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.11	1.00	1.00	0.02	0.39	0.39
Sat Flow, veh/h	1126	1800	1510	282	987	185	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	108	133	44	275	0	0	74	1425	111	32	1746	76
Grp Sat Flow(s),veh/h/ln	1126	1800	1510	1454	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	1.2	7.4	2.8	14.8	0.0	0.0	5.4	0.0	0.0	2.4	57.1	3.8
Cycle Q Clear(g_c), s	23.3	7.4	2.8	22.2	0.0	0.0	5.4	0.0	0.0	2.4	57.1	3.8
Prop In Lane	1.00		1.00	0.24		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	413	346	371	0	0	91	2072	927	44	1973	882
V/C Ratio(X)	0.53	0.32	0.13	0.74	0.00	0.00	0.81	0.69	0.12	0.72	0.88	0.09
Avail Cap(c_a), veh/h	292	555	466	496	0	0	169	2072	927	101	1973	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.53	0.53	0.53	0.58	0.58	0.58
Uniform Delay (d), s/veh	45.3	38.5	36.7	44.6	0.0	0.0	52.6	0.0	0.0	58.5	33.1	16.7
Incr Delay (d2), s/veh	2.1	0.4	0.2	4.1	0.0	0.0	3.5	1.0	0.1	4.8	3.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	3.7	1.2	9.1	0.0	0.0	2.5	0.3	0.0	1.1	28.0	1.6
LnGrp Delay(d),s/veh	47.4	38.9	36.9	48.7	0.0	0.0	56.1	1.0	0.1	63.2	36.9	16.8
LnGrp LOS	D	D	D	D			E	A	A	E	D	B
Approach Vol, veh/h		285			275			1610			1854	
Approach Delay, s/veh		41.8			48.7			3.5			36.5	
Approach LOS		D			D			A			D	

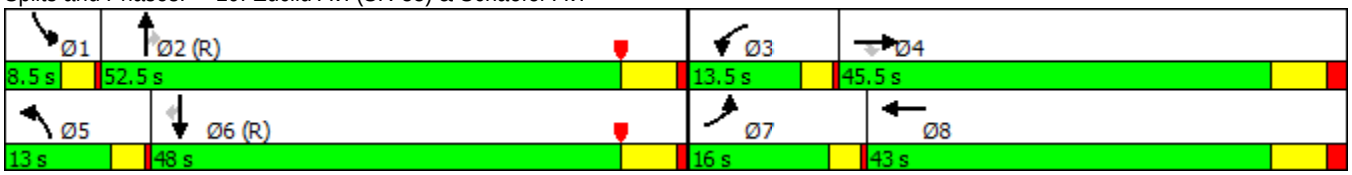
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	78.7		34.5	10.3	75.2		34.5
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.4	2.0		25.3	7.4	59.1		24.2
Green Ext Time (p_c), s	0.0	44.3		2.2	0.0	0.0		2.3

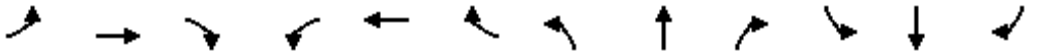
Intersection Summary	
HCM 2010 Ctrl Delay	24.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	142	62	116	57	121	120	1431	21	15	1608	134
Future Volume (vph)	142	62	116	57	121	120	1431	21	15	1608	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.4	22.8	22.8	10.0	17.7	14.7	69.7	69.7	5.4	55.2	55.2
Actuated g/C Ratio	0.10	0.19	0.19	0.08	0.15	0.12	0.58	0.58	0.04	0.46	0.46
v/c Ratio	0.91	0.19	0.32	0.46	0.56	0.65	0.77	0.02	0.22	1.09	0.19
Control Delay	103.1	40.6	8.1	63.9	51.5	43.3	32.1	1.2	61.3	79.6	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.1	40.6	8.1	63.9	51.5	43.3	32.1	1.2	61.3	79.6	8.5
LOS	F	D	A	E	D	D	C	A	E	E	A
Approach Delay		56.6			55.1		32.5			74.0	
Approach LOS		E			E		C			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 54.6	Intersection LOS: D
Intersection Capacity Utilization 88.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	62	116	57	121	18	120	1431	21	15	1608	134
Future Volume (veh/h)	142	62	116	57	121	18	120	1431	21	15	1608	134
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	151	66	71	61	129	17	128	1522	17	16	1711	95
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	169	247	210	117	164	22	128	2074	928	28	1862	814
Arrive On Green	0.10	0.14	0.14	0.07	0.11	0.11	0.03	0.20	0.20	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1558	205	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	151	66	71	61	0	146	128	1522	17	16	1711	95
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	11.1	3.9	5.0	4.4	0.0	9.7	9.5	50.1	1.1	1.2	59.0	6.4
Cycle Q Clear(g_c), s	11.1	3.9	5.0	4.4	0.0	9.7	9.5	50.1	1.1	1.2	59.0	6.4
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	247	210	117	0	186	128	2074	928	28	1862	814
V/C Ratio(X)	0.90	0.27	0.34	0.52	0.00	0.78	1.00	0.73	0.02	0.57	0.92	0.12
Avail Cap(c_a), veh/h	169	578	491	135	0	529	128	2074	928	67	1862	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.28	0.28	0.28	0.39	0.39	0.39
Uniform Delay (d), s/veh	53.1	46.4	46.8	53.6	0.0	52.3	58.4	38.9	19.3	59.2	46.6	25.0
Incr Delay (d2), s/veh	39.9	0.4	0.7	1.3	0.0	5.4	41.9	0.7	0.0	2.7	3.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	2.0	2.2	2.0	0.0	5.0	5.7	24.0	0.5	0.6	29.0	2.7
LnGrp Delay(d),s/veh	93.0	46.8	47.5	55.0	0.0	57.7	100.4	39.6	19.3	61.9	50.5	25.2
LnGrp LOS	F	D	D	D		E	F	D	B	E	D	C
Approach Vol, veh/h		288			207			1667			1822	
Approach Delay, s/veh		71.2			56.9			44.0			49.3	
Approach LOS		E			E			D			D	

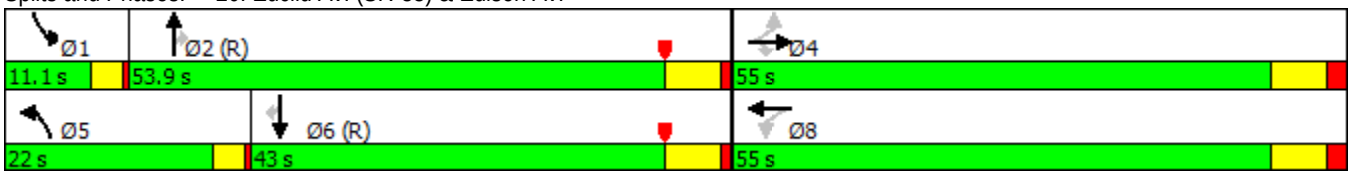
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	78.8	12.2	23.5	13.0	71.3	16.0	19.7
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	52.1	6.4	7.0	11.5	61.0	13.1	11.7
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	218	169	224	68	349	249	1278	37	41	1446	252
Future Volume (vph)	218	169	224	68	349	249	1278	37	41	1446	252
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.5	44.5	44.5	44.5	44.5	21.3	53.9	53.9	6.8	37.8	37.8
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.18	0.45	0.45	0.06	0.32	0.32
v/c Ratio	1.09	0.27	0.33	0.18	0.63	0.93	0.88	0.05	0.48	1.43	0.48
Control Delay	124.1	26.7	4.2	25.4	34.7	76.8	43.1	5.1	83.7	214.1	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	124.1	26.7	4.2	25.4	34.7	76.8	43.1	5.1	83.7	214.1	2.8
LOS	F	C	A	C	C	E	D	A	F	F	A
Approach Delay		53.2			33.3		47.6			180.4	
Approach LOS		D			C		D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.43	
Intersection Signal Delay: 99.7	Intersection LOS: F
Intersection Capacity Utilization 113.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	169	224	68	349	40	249	1278	37	41	1446	252
Future Volume (veh/h)	218	169	224	68	349	40	249	1278	37	41	1446	252
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	232	180	171	72	371	41	265	1360	24	44	1538	237
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	720	612	389	637	70	250	1467	656	54	1054	471
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.21	0.57	0.57	0.07	0.62	0.62
Sat Flow, veh/h	934	1800	1530	988	1593	176	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	232	180	171	72	0	412	265	1360	24	44	1538	237
Grp Sat Flow(s),veh/h/ln	934	1800	1530	988	0	1769	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	26.1	8.0	9.1	6.3	0.0	21.9	18.5	43.5	0.8	3.2	37.0	10.3
Cycle Q Clear(g_c), s	48.0	8.0	9.1	14.3	0.0	21.9	18.5	43.5	0.8	3.2	37.0	10.3
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	720	612	389	0	708	250	1467	656	54	1055	471
V/C Ratio(X)	0.88	0.25	0.28	0.18	0.00	0.58	1.06	0.93	0.04	0.81	1.46	0.50
Avail Cap(c_a), veh/h	263	720	612	389	0	708	250	1467	656	103	1055	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	0.09	0.09	0.09
Uniform Delay (d), s/veh	48.5	24.0	24.3	28.8	0.0	28.2	47.7	24.0	14.9	55.6	23.0	17.9
Incr Delay (d2), s/veh	27.2	0.2	0.2	0.2	0.0	1.2	66.8	9.2	0.1	1.0	206.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	4.0	3.8	1.7	0.0	10.9	12.9	22.3	0.4	1.5	47.3	4.3
LnGrp Delay(d),s/veh	75.7	24.2	24.6	29.0	0.0	29.4	114.5	33.2	15.0	56.6	229.8	18.2
LnGrp LOS	E	C	C	C		C	F	C	B	E	F	B
Approach Vol, veh/h		583			484			1649			1819	
Approach Delay, s/veh		44.8			29.3			46.0			198.1	
Approach LOS		D			C			D			F	

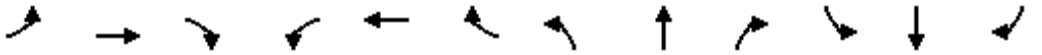
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	57.5		55.0	22.0	43.0		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.2	45.5		50.0	20.5	39.0		23.9
Green Ext Time (p_c), s	0.0	2.3		0.0	0.0	0.0		5.8

Intersection Summary			
HCM 2010 Ctrl Delay		105.1	
HCM 2010 LOS		F	

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	55	7	205	20	45	177	1486	7	22	1681	28
Future Volume (vph)	55	7	205	20	45	177	1486	7	22	1681	28
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	21.0	63.5	63.5	9.7	52.2	52.2
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	17.5%	52.9%	52.9%	8.1%	43.5%	43.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.8	15.8	15.8	15.8	15.8	17.4	87.5	87.5	6.2	72.8	72.8
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.14	0.73	0.73	0.05	0.61	0.61
v/c Ratio	0.36	0.03	0.55	0.12	0.32	0.79	0.62	0.01	0.28	0.84	0.03
Control Delay	49.0	36.6	10.2	40.8	29.4	63.0	9.1	0.0	76.4	14.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	36.6	10.2	40.8	29.4	63.0	9.1	0.0	76.4	14.9	1.2
LOS	D	D	B	D	C	E	A	A	E	B	A
Approach Delay		18.8			31.8		14.8			15.5	
Approach LOS		B			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 82.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	7	205	20	45	31	177	1486	7	22	1681	28
Future Volume (veh/h)	55	7	205	20	45	31	177	1486	7	22	1681	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	57	7	128	21	47	25	184	1548	7	23	1751	25
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	145	192	163	184	118	63	208	2580	1154	36	2216	970
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.13	0.75	0.75	0.01	0.21	0.21
Sat Flow, veh/h	1274	1800	1530	1204	1107	589	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	57	7	128	21	0	72	184	1548	7	23	1751	25
Grp Sat Flow(s),veh/h/ln	1274	1800	1530	1204	0	1696	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	5.2	0.4	9.8	1.9	0.0	4.8	13.4	24.4	0.1	1.7	58.1	1.6
Cycle Q Clear(g_c), s	10.0	0.4	9.8	2.3	0.0	4.8	13.4	24.4	0.1	1.7	58.1	1.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	192	163	184	0	181	208	2580	1154	36	2216	970
V/C Ratio(X)	0.39	0.04	0.78	0.11	0.00	0.40	0.88	0.60	0.01	0.64	0.79	0.03
Avail Cap(c_a), veh/h	456	630	535	477	0	594	236	2580	1154	84	2216	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.7	48.1	52.3	49.1	0.0	50.0	51.4	6.6	3.6	59.1	39.4	17.2
Incr Delay (d2), s/veh	1.3	0.1	6.1	0.2	0.0	1.1	27.1	1.0	0.0	1.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	4.4	0.6	0.0	2.3	7.5	11.8	0.1	0.8	27.7	0.7
LnGrp Delay(d),s/veh	56.0	48.1	58.3	49.3	0.0	51.1	78.5	7.6	3.6	60.3	39.7	17.2
LnGrp LOS	E	D	E	D		D	E	A	A	E	D	B
Approach Vol, veh/h		192			93			1739			1799	
Approach Delay, s/veh		57.3			50.7			15.1			39.7	
Approach LOS		E			D			B			D	

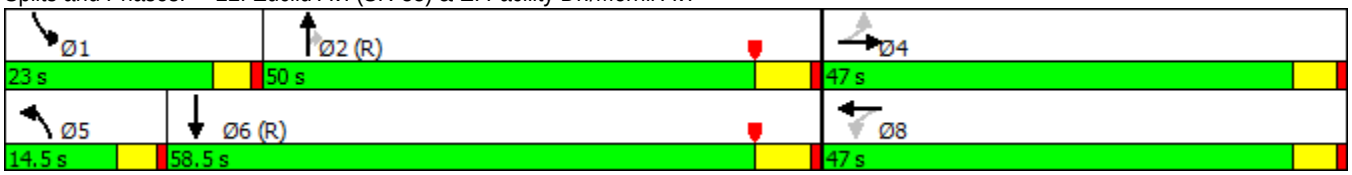
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	96.2		17.6	18.9	83.5		17.6
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	57.8		42.0	17.5	46.5		42.0
Max Q Clear Time (g_c+I1), s	3.7	26.4		12.0	15.4	60.1		6.8
Green Ext Time (p_c), s	0.0	27.4		0.8	0.1	0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	29.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	387	48	20	1046	183	480	1418
Future Volume (vph)	8	6	387	48	20	1046	183	480	1418
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		42.0		42.0	10.0	44.0	44.0	18.5	61.2
Actuated g/C Ratio		0.35		0.35	0.08	0.37	0.37	0.15	0.51
v/c Ratio		0.04		2.01	0.16	0.87	0.31	2.02	0.88
Control Delay		22.0		485.8	61.6	27.6	9.5	491.9	27.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.0		485.8	61.6	27.6	9.5	491.9	27.1
LOS		C		F	E	C	A	F	C
Approach Delay		22.0		485.8		25.5			142.0
Approach LOS		C		F		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.02	
Intersection Signal Delay: 192.0	Intersection LOS: F
Intersection Capacity Utilization 145.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	387	48	614	20	1046	183	480	1418	44
Future Volume (veh/h)	8	6	4	387	48	614	20	1046	183	480	1418	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	403	50	594	21	1090	165	500	1477	43
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	205	147	66	243	25	297	68	1254	561	250	1625	47
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.04	0.37	0.37	0.15	0.48	0.48
Sat Flow, veh/h	459	421	189	575	71	847	1619	3420	1530	1619	3394	99
Grp Volume(v), veh/h	17	0	0	1047	0	0	21	1090	165	500	743	777
Grp Sat Flow(s),veh/h/ln	1069	0	0	1493	0	0	1619	1710	1530	1619	1710	1783
Q Serve(g_s), s	0.0	0.0	0.0	41.2	0.0	0.0	1.5	35.6	9.2	18.5	48.1	48.3
Cycle Q Clear(g_c), s	0.8	0.0	0.0	42.0	0.0	0.0	1.5	35.6	9.2	18.5	48.1	48.3
Prop In Lane	0.47		0.18	0.38		0.57	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	418	0	0	564	0	0	68	1254	561	250	819	854
V/C Ratio(X)	0.04	0.00	0.00	1.86	0.00	0.00	0.31	0.87	0.29	2.00	0.91	0.91
Avail Cap(c_a), veh/h	418	0	0	564	0	0	135	1254	561	250	819	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	0.0	40.5	0.0	0.0	55.8	35.3	27.0	50.8	28.8	28.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	391.8	0.0	0.0	0.1	0.8	0.1	465.4	15.7	15.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	80.1	0.0	0.0	0.7	17.0	3.9	40.5	26.1	27.4
LnGrp Delay(d),s/veh	25.6	0.0	0.0	432.3	0.0	0.0	55.9	36.2	27.1	516.1	44.5	44.3
LnGrp LOS	C			F			E	D	C	F	D	D
Approach Vol, veh/h		17			1047			1276			2020	
Approach Delay, s/veh		25.6			432.3			35.3			161.2	
Approach LOS		C			F			D			F	

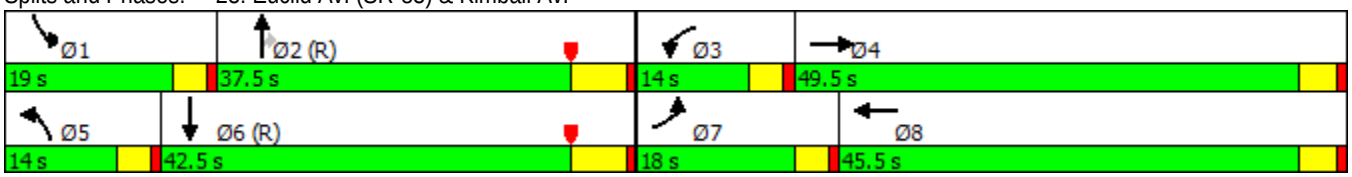
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	50.0		47.0	9.5	63.5		47.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	20.5	37.6		2.8	3.5	50.3		44.0
Green Ext Time (p_c), s	0.0	5.8		6.3	0.0	2.1		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		188.9
HCM 2010 LOS		F

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	278	323	129	587	174	783	188	334	726
Future Volume (vph)	278	323	129	587	174	783	188	334	726
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	14.0	35.5	10.0	31.5	19.5	31.5	31.5	24.5	36.5
Actuated g/C Ratio	0.12	0.30	0.08	0.26	0.16	0.26	0.26	0.20	0.30
v/c Ratio	1.51	0.38	0.99	0.82	0.68	0.89	0.35	1.04	1.26
Control Delay	291.9	32.3	129.2	48.0	44.7	44.4	10.8	80.7	141.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	291.9	32.3	129.2	48.0	44.7	44.4	10.8	80.7	141.1
LOS	F	C	F	D	D	D	B	F	F
Approach Delay		143.8		60.4		38.9			129.1
Approach LOS		F		E		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.51	
Intersection Signal Delay: 94.0	Intersection LOS: F
Intersection Capacity Utilization 107.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	323	46	129	587	130	174	783	188	334	726	624
Future Volume (veh/h)	278	323	46	129	587	130	174	783	188	334	726	624
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	284	330	45	132	599	111	178	799	184	341	741	599
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	189	851	115	135	714	132	135	1219	545	202	719	569
Arrive On Green	0.12	0.28	0.28	0.08	0.25	0.25	0.03	0.12	0.12	0.13	0.40	0.40
Sat Flow, veh/h	1619	3028	409	1619	2883	533	1619	3420	1530	1619	1806	1430
Grp Volume(v), veh/h	284	185	190	132	355	355	178	799	184	341	701	639
Grp Sat Flow(s),veh/h/ln	1619	1710	1728	1619	1710	1706	1619	1710	1530	1619	1710	1526
Q Serve(g_s), s	14.0	10.5	10.7	9.8	23.6	23.7	10.0	26.8	13.3	15.0	47.8	47.8
Cycle Q Clear(g_c), s	14.0	10.5	10.7	9.8	23.6	23.7	10.0	26.8	13.3	15.0	47.8	47.8
Prop In Lane	1.00		0.24	1.00		0.31	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	189	481	486	135	424	423	135	1219	545	202	681	607
V/C Ratio(X)	1.50	0.39	0.39	0.98	0.84	0.84	1.32	0.66	0.34	1.68	1.03	1.05
Avail Cap(c_a), veh/h	189	641	648	135	584	583	135	1219	545	202	681	607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.36	0.36	0.36	0.36	0.36	0.36
Uniform Delay (d), s/veh	53.0	34.8	34.8	54.9	42.8	42.9	58.4	45.9	39.9	52.5	36.1	36.1
Incr Delay (d2), s/veh	250.3	0.5	0.5	70.4	5.6	5.8	161.5	1.0	0.6	315.9	28.7	37.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.4	5.0	5.1	7.0	11.8	11.8	10.5	12.9	5.7	24.4	27.9	26.3
LnGrp Delay(d),s/veh	303.3	35.2	35.3	125.3	48.5	48.7	219.9	46.9	40.5	368.4	64.8	73.3
LnGrp LOS	F	D	D	F	D	D	F	D	D	F	F	F
Approach Vol, veh/h		659			842			1161			1681	
Approach Delay, s/veh		150.8			60.6			72.4			129.6	
Approach LOS		F			E			E			F	

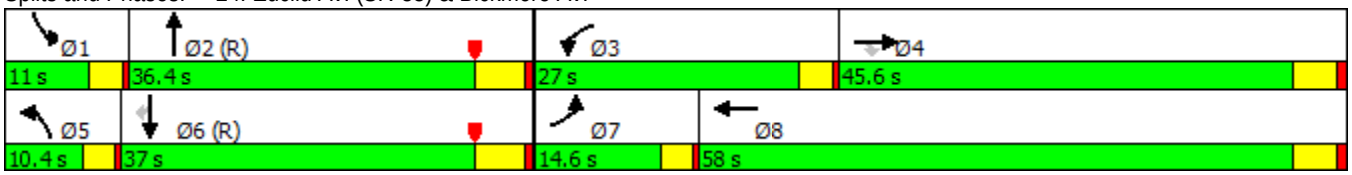
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	48.8	14.0	38.2	14.0	53.8	18.0	34.2
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	28.8	11.8	12.7	12.0	49.8	16.0	25.7
Green Ext Time (p_c), s	0.0	2.4	0.0	4.7	0.0	0.0	0.0	4.0

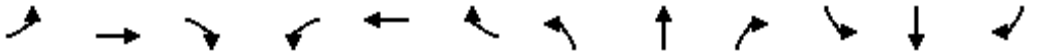
Intersection Summary	
HCM 2010 Ctrl Delay	104.2
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	86	28	52	278	411	79	774	71	685	112
Future Volume (vph)	86	28	52	278	411	79	774	71	685	112
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.8	32.8	32.8	30.0	51.0	7.9	34.1	7.6	33.8	33.8
Actuated g/C Ratio	0.08	0.27	0.27	0.25	0.42	0.07	0.28	0.06	0.28	0.28
v/c Ratio	0.69	0.06	0.11	0.73	0.96	0.79	0.89	0.75	0.76	0.23
Control Delay	79.5	27.5	0.4	56.5	56.8	43.2	35.8	60.4	22.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	27.5	0.4	56.5	56.8	43.2	35.8	60.4	22.4	4.9
LOS	E	C	A	E	E	D	D	E	C	A
Approach Delay		45.9			56.7		36.4		23.2	
Approach LOS		D			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 39.7	Intersection LOS: D
Intersection Capacity Utilization 88.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	28	52	278	411	257	79	774	40	71	685	112
Future Volume (veh/h)	86	28	52	278	411	257	79	774	40	71	685	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	91	30	53	296	437	260	84	823	42	76	729	110
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	111	540	459	317	452	269	93	992	51	95	1028	460
Arrive On Green	0.07	0.30	0.30	0.20	0.43	0.43	0.02	0.10	0.10	0.02	0.10	0.10
Sat Flow, veh/h	1619	1800	1528	1619	1059	630	1619	3311	169	1619	3420	1530
Grp Volume(v), veh/h	91	30	53	296	0	697	84	425	440	76	729	110
Grp Sat Flow(s),veh/h/ln	1619	1800	1528	1619	0	1689	1619	1710	1770	1619	1710	1530
Q Serve(g_s), s	6.7	1.4	3.0	21.6	0.0	48.3	6.2	29.3	29.3	5.6	24.8	8.0
Cycle Q Clear(g_c), s	6.7	1.4	3.0	21.6	0.0	48.3	6.2	29.3	29.3	5.6	24.8	8.0
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	111	540	459	317	0	722	93	513	531	95	1028	460
V/C Ratio(X)	0.82	0.06	0.12	0.93	0.00	0.97	0.90	0.83	0.83	0.80	0.71	0.24
Avail Cap(c_a), veh/h	150	609	517	317	0	746	93	513	531	101	1028	460
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.1	29.9	30.4	47.5	0.0	33.5	58.5	51.1	51.1	58.2	49.0	41.4
Incr Delay (d2), s/veh	16.7	0.0	0.0	33.2	0.0	24.2	10.6	1.5	1.5	3.7	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.7	1.3	12.5	0.0	27.3	3.1	14.1	14.6	2.6	11.8	3.4
LnGrp Delay(d),s/veh	71.8	29.9	30.5	80.7	0.0	57.7	69.1	52.6	52.5	61.8	49.3	41.5
LnGrp LOS	E	C	C	F		E	E	D	D	E	D	D
Approach Vol, veh/h		174			993			949			915	
Approach Delay, s/veh		52.0			64.5			54.0			49.4	
Approach LOS		D			E			D			D	

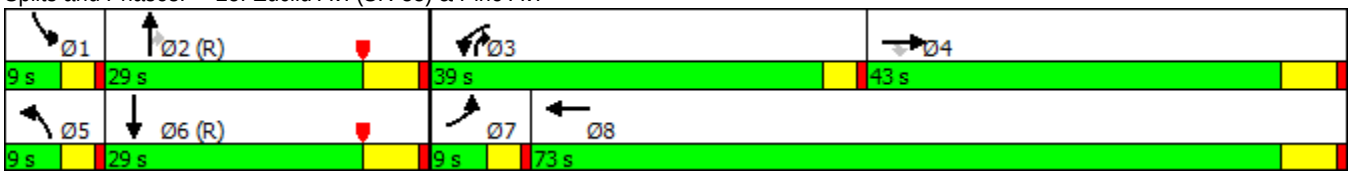
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	41.5	27.0	41.0	10.4	41.6	11.8	56.3
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	7.6	31.3	23.6	5.0	8.2	26.8	8.7	50.3
Green Ext Time (p_c), s	0.0	0.0	0.0	3.4	0.0	2.7	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	56.0
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	223	33	897	169	59	876	506	83	910
Future Volume (vph)	5	223	33	897	169	59	876	506	83	910
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	23.0	23.0	35.0	60.2	8.6	29.6	66.6	12.4	33.4
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.25	0.56	0.10	0.28
v/c Ratio	0.07	0.65	0.08	1.05	0.30	0.52	1.05	0.51	0.50	0.98
Control Delay	57.8	52.6	0.4	87.1	15.2	62.7	90.4	4.3	66.1	50.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.6	0.4	87.1	15.2	62.7	90.4	4.3	66.1	50.9
LOS	E	D	A	F	B	E	F	A	E	D
Approach Delay		46.1			70.8		59.1			52.2
Approach LOS		D			E		E			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 59.9	Intersection LOS: E
Intersection Capacity Utilization 90.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	223	33	897	169	93	59	876	506	83	910	15
Future Volume (veh/h)	5	223	33	897	169	93	59	876	506	83	910	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	225	0	906	171	79	60	885	333	84	919	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	298	253	862	523	242	67	1144	947	67	1159	13
Arrive On Green	0.01	0.17	0.00	0.29	0.45	0.45	0.04	0.33	0.33	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1161	536	1619	3420	1496	1619	3465	38
Grp Volume(v), veh/h	5	225	0	906	0	250	60	885	333	84	454	475
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1697	1619	1710	1496	1619	1710	1792
Q Serve(g_s), s	0.4	14.3	0.0	35.0	0.0	11.4	4.4	27.9	12.8	5.0	31.0	31.0
Cycle Q Clear(g_c), s	0.4	14.3	0.0	35.0	0.0	11.4	4.4	27.9	12.8	5.0	31.0	31.0
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	10	298	253	862	0	765	67	1144	947	67	572	600
V/C Ratio(X)	0.48	0.76	0.00	1.05	0.00	0.33	0.89	0.77	0.35	1.25	0.79	0.79
Avail Cap(c_a), veh/h	67	555	472	862	0	948	67	1144	947	67	572	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.29	0.29	0.29	0.63	0.63	0.63
Uniform Delay (d), s/veh	59.4	47.8	0.0	42.5	0.0	21.2	57.2	35.9	10.8	59.2	49.3	49.3
Incr Delay (d2), s/veh	12.4	5.5	0.0	44.9	0.0	0.4	31.0	1.6	0.3	166.6	7.0	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.6	0.0	19.6	0.0	5.4	2.6	13.4	5.3	5.4	15.8	16.5
LnGrp Delay(d),s/veh	71.8	53.2	0.0	87.4	0.0	21.6	88.2	37.4	11.1	225.7	56.3	56.0
LnGrp LOS	E	D		F		C	F	D	B	F	E	E
Approach Vol, veh/h		230			1156			1278			1013	
Approach Delay, s/veh		53.6			73.1			32.9			70.3	
Approach LOS		D			E			C			E	

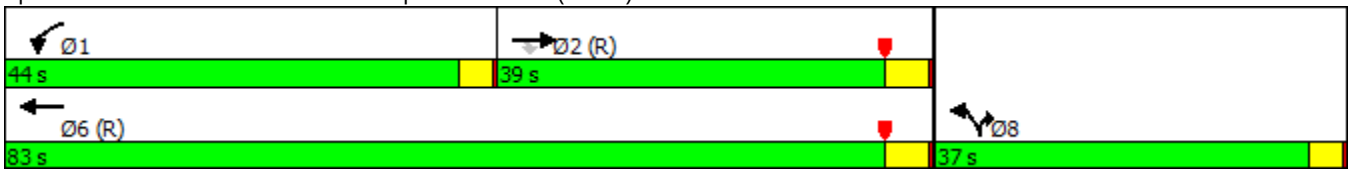
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	46.1	39.0	25.9	9.0	46.1	4.8	60.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	7.0	29.9	37.0	16.3	6.4	33.0	2.4	13.4
Green Ext Time (p_c), s	0.0	0.0	0.0	3.6	0.0	0.0	0.0	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	57.1
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	548	306	602	1230	73	929
Future Volume (vph)	548	306	602	1230	73	929
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	39.0	39.0	44.0	83.0	37.0	37.0
Total Split (%)	32.5%	32.5%	36.7%	69.2%	30.8%	30.8%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	34.5	34.5	40.5	78.5	33.5	33.5
Actuated g/C Ratio	0.29	0.29	0.34	0.65	0.28	0.28
v/c Ratio	0.58	0.48	1.09	0.57	0.08	1.10
Control Delay	61.1	25.7	86.6	1.1	32.3	78.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.1	25.7	86.6	1.1	32.3	78.4
LOS	E	C	F	A	C	E
Approach Delay	48.4			29.2	75.1	
Approach LOS	D			C	E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 46.1	Intersection LOS: D
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	548	306	602	1230	73	929
Future Volume (veh/h)	548	306	602	1230	73	929
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	571	0	627	1281	76	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1796	803	579	3050	139	64
Arrive On Green	1.00	0.00	0.34	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	571	0	627	1281	76	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	40.5	7.8	2.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	40.5	7.8	2.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1796	803	579	3050	139	64
V/C Ratio(X)	0.32	0.00	1.08	0.42	0.55	0.00
Avail Cap(c_a), veh/h	1796	803	579	3050	928	427
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	39.8	1.1	56.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	41.0	0.0	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	25.7	3.6	1.3	0.0
LnGrp Delay(d),s/veh	0.5	0.0	80.7	1.2	59.7	0.0
LnGrp LOS	A		F	A	E	
Approach Vol, veh/h	571			1908	76	
Approach Delay, s/veh	0.5			27.3	59.7	
Approach LOS	A			C	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	44.0	67.5				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	40.5	34.5				78.5		33.5
Max Q Clear Time (g_c+I1), s	42.5	2.0				9.8		4.7
Green Ext Time (p_c), s	0.0	13.2				15.6		0.2

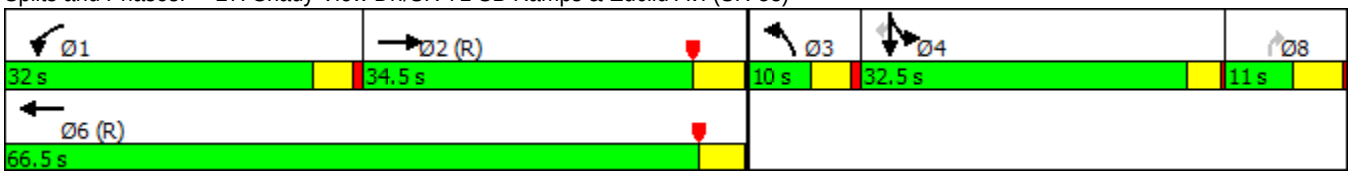
Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	818	404	246	63	306	277	21	37
Future Volume (vph)	818	404	246	63	306	277	21	37
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	34.5	32.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	28.8%	26.7%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	29.5	36.2	70.7	5.5	7.4	18.9	18.9	18.9
Actuated g/C Ratio	0.25	0.30	0.59	0.05	0.06	0.16	0.16	0.16
v/c Ratio	1.09	0.91	0.13	0.93	0.82	0.68	0.63	0.11
Control Delay	102.5	65.6	3.6	144.5	22.9	60.8	57.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.5	65.6	3.6	144.5	22.9	60.8	57.2	0.6
LOS	F	E	A	F	C	E	E	A
Approach Delay	102.5		42.2				52.5	
Approach LOS	F		D				D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 67.0 — Intersection LOS: E
Intersection Capacity Utilization 76.1% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	818	17	404	246	0	63	0	306	277	21	37
Future Volume (veh/h)	0	818	17	404	246	0	63	0	306	277	21	37
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	899	19	444	270	0	69	0	336	320	0	41
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1852	39	371	2761	0	0	0	0	394	0	186
Arrive On Green	0.00	0.54	0.54	0.38	1.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Sat Flow, veh/h	0	3515	72	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	449	469	444	270	0		0.0		320	0	41
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	19.6	19.6	27.5	0.0	0.0				11.6	0.0	2.9
Cycle Q Clear(g_c), s	0.0	19.6	19.6	27.5	0.0	0.0				11.6	0.0	2.9
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	925	966	371	2761	0				394	0	186
V/C Ratio(X)	0.00	0.49	0.49	1.20	0.10	0.00				0.81	0.00	0.22
Avail Cap(c_a), veh/h	0	925	966	371	2761	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.2	17.2	37.0	0.0	0.0				51.4	0.0	47.6
Incr Delay (d2), s/veh	0.0	1.8	1.7	111.9	0.1	0.0				4.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.7	10.1	23.7	0.0	0.0				5.4	0.0	1.3
LnGrp Delay(d),s/veh	0.0	19.0	18.9	148.9	0.1	0.0				55.4	0.0	48.1
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		918			714						361	
Approach Delay, s/veh		18.9			92.6						54.6	
Approach LOS		B			F						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	32.0	69.9		18.1		101.9		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	27.5	29.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	29.5	21.6		13.6		2.0		
Green Ext Time (p_c), s	0.0	3.1		1.1		5.1		

Intersection Summary	
HCM 2010 Ctrl Delay	51.8
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	961	0	0	1374	0	0	0	0	1	0	0
Future Vol, veh/h	3	961	0	0	1374	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	1056	0	0	1510	0	0	0	0	1	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	1510	0	-	-	-	0				2573	2573	1510
Stage 1	-	-	-	-	-	-				1510	1510	-
Stage 2	-	-	-	-	-	-				1063	1063	-
Critical Hdwy	4.1	-	-	-	-	-				6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	449	-	0	0	-	-				29	26	150
Stage 1	-	-	0	0	-	-				204	185	-
Stage 2	-	-	0	0	-	-				335	302	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	449	-	-	-	-	-				29	0	150
Mov Cap-2 Maneuver	-	-	-	-	-	-				128	0	-
Stage 1	-	-	-	-	-	-				204	0	-
Stage 2	-	-	-	-	-	-				333	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	33.4
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	449	-	-	-	128
HCM Lane V/C Ratio	0.007	-	-	-	0.009
HCM Control Delay (s)	13.1	-	-	-	33.4
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	828	35	21	941	58	47
Future Vol, veh/h	828	35	21	941	58	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	863	36	22	980	60	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	899	0	1905	449
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	1024	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	764	-	69	563
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	350	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	764	-	67	563
Mov Cap-2 Maneuver	-	-	-	-	245	-
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	340	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	18.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	245	563	-	-	764	-
HCM Lane V/C Ratio	0.247	0.087	-	-	0.029	-
HCM Control Delay (s)	24.4	12	-	-	9.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.9	0.3	-	-	0.1	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	811	33	799	164	39
Future Volume (vph)	811	33	799	164	39
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	26.0	5.1	29.2	10.3	10.3
Actuated g/C Ratio	0.51	0.10	0.57	0.20	0.20
v/c Ratio	0.56	0.22	0.85	0.56	0.13
Control Delay	10.5	28.4	18.1	30.3	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	28.4	18.1	30.3	9.3
LOS	B	C	B	C	A
Approach Delay	10.5		18.5	26.3	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	811	64	33	799	164	39
Future Volume (veh/h)	811	64	33	799	164	39
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	891	70	36	878	180	40
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1537	121	63	1086	301	285
Arrive On Green	0.48	0.48	0.04	0.60	0.19	0.19
Sat Flow, veh/h	3297	252	1619	1800	1619	1530
Grp Volume(v), veh/h	475	486	36	878	180	40
Grp Sat Flow(s),veh/h/ln	1710	1749	1619	1800	1619	1530
Q Serve(g_s), s	10.8	10.8	1.2	20.3	5.5	1.2
Cycle Q Clear(g_c), s	10.8	10.8	1.2	20.3	5.5	1.2
Prop In Lane		0.14	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	819	838	63	1086	301	285
V/C Ratio(X)	0.58	0.58	0.57	0.81	0.60	0.14
Avail Cap(c_a), veh/h	926	947	151	1297	301	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	10.1	25.4	8.2	20.0	18.3
Incr Delay (d2), s/veh	0.7	0.7	3.1	3.3	8.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.3	0.6	10.8	3.2	0.6
LnGrp Delay(d),s/veh	10.8	10.8	28.5	11.6	28.5	19.3
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	961			914	220	
Approach Delay, s/veh	10.8			12.2	26.8	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.7	31.9				38.6		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	3.2	12.8				22.3		7.5
Green Ext Time (p_c), s	0.0	10.1				10.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	738	71	604	228	81
Future Volume (vph)	738	71	604	228	81
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	21.7	5.5	29.1	13.8	13.8
Actuated g/C Ratio	0.40	0.10	0.54	0.26	0.26
v/c Ratio	0.74	0.49	0.70	0.62	0.23
Control Delay	18.0	38.4	13.2	29.4	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	38.4	13.2	29.4	17.9
LOS	B	D	B	C	B
Approach Delay	18.0		15.8	26.4	
Approach LOS	B		B	C	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 54.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 18.6		Intersection LOS: B	
Intersection Capacity Utilization 57.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	738	139	71	604	228	81
Future Volume (veh/h)	738	139	71	604	228	81
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	829	156	80	679	256	73
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1157	218	105	997	400	378
Arrive On Green	0.40	0.40	0.06	0.55	0.25	0.25
Sat Flow, veh/h	2950	538	1619	1800	1619	1530
Grp Volume(v), veh/h	496	489	80	679	256	73
Grp Sat Flow(s),veh/h/ln	1710	1688	1619	1800	1619	1530
Q Serve(g_s), s	13.2	13.2	2.6	14.7	7.7	2.0
Cycle Q Clear(g_c), s	13.2	13.2	2.6	14.7	7.7	2.0
Prop In Lane		0.32	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	692	683	105	997	400	378
V/C Ratio(X)	0.72	0.72	0.77	0.68	0.64	0.19
Avail Cap(c_a), veh/h	813	803	161	1188	400	378
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	13.5	25.0	8.7	18.3	16.1
Incr Delay (d2), s/veh	2.5	2.5	4.3	1.3	7.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.6	1.3	7.5	4.3	1.0
LnGrp Delay(d),s/veh	16.1	16.1	29.3	9.9	25.9	17.3
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	985			759	329	
Approach Delay, s/veh	16.1			12.0	24.0	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.1	28.1				36.2		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.6	15.2				16.7		9.7
Green Ext Time (p_c), s	0.0	6.7				9.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	71.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	398	410	11	5	464	124	19	20	18	96	13	192
Future Vol, veh/h	398	410	11	5	464	124	19	20	18	96	13	192
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	419	432	12	5	488	131	20	21	19	101	14	202

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	620	0	0	445	0	0	1949	1907	225	1630	1848	555
Stage 1	-	-	-	-	-	-	1277	1277	-	565	565	-
Stage 2	-	-	-	-	-	-	672	630	-	1065	1283	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	970	-	-	1126	-	-	44	69	784	~ 75	75	535
Stage 1	-	-	-	-	-	-	179	239	-	513	511	-
Stage 2	-	-	-	-	-	-	449	478	-	241	238	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	970	-	-	1125	-	-	~ 16	39	782	~ 33	42	534
Mov Cap-2 Maneuver	-	-	-	-	-	-	175	49	-	~ 83	106	-
Stage 1	-	-	-	-	-	-	101	136	-	291	508	-
Stage 2	-	-	-	-	-	-	270	475	-	113	135	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.6	0.1	76.2	$ 390.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	106	970	-	-	1125	-	-	184
HCM Lane V/C Ratio	0.566	0.432	-	-	0.005	-	-	1.722
HCM Control Delay (s)	76.2	11.5	-	-	8.2	-	-	$ 390.8
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	2.7	2.2	-	-	0	-	-	22

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	399	15	25	518	8	58	0	22	2	0	16
Future Vol, veh/h	109	399	15	25	518	8	58	0	22	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	438	16	27	569	9	64	0	24	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	578	0	0	456	0	0	1322	1318	228	1085	1322	574
Stage 1	-	-	-	-	-	-	685	685	-	629	629	-
Stage 2	-	-	-	-	-	-	637	633	-	456	693	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1006	-	-	1115	-	-	125	159	781	184	158	522
Stage 1	-	-	-	-	-	-	409	451	-	474	478	-
Stage 2	-	-	-	-	-	-	469	476	-	559	448	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1006	-	-	1115	-	-	108	137	780	159	136	522
Mov Cap-2 Maneuver	-	-	-	-	-	-	250	276	-	159	136	-
Stage 1	-	-	-	-	-	-	361	398	-	418	466	-
Stage 2	-	-	-	-	-	-	442	464	-	478	395	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.4	21.4	14.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	307	1006	-	-	1115	-	-	416
HCM Lane V/C Ratio	0.286	0.118	-	-	0.025	-	-	0.047
HCM Control Delay (s)	21.4	9.1	-	-	8.3	-	-	14.1
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.2	0.4	-	-	0.1	-	-	0.1

Intersection	
Intersection Delay, s/veh	28.3
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	230	0	194	0	0	0	0	0	293	465	0
Future Vol, veh/h	0	230	0	194	0	0	0	0	0	293	465	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	247	0	209	0	0	0	0	0	315	500	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	17.5	40.8
HCM LOS	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	293	465	230	194	120	255
LT Vol	293	0	230	0	0	0
Through Vol	0	465	0	0	120	0
RT Vol	0	0	0	194	0	255
Lane Flow Rate	315	500	247	209	129	274
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.641	0.946	0.555	0.397	0.267	0.512
Departure Headway (Hd)	7.32	6.808	8.085	6.858	7.437	6.717
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	495	535	448	526	484	537
Service Time	5.038	4.526	5.803	4.577	5.173	4.453
HCM Lane V/C Ratio	0.636	0.935	0.551	0.397	0.267	0.51
HCM Control Delay	22.2	52.6	20.4	14	12.9	16.3
HCM Lane LOS	C	F	C	B	B	C
HCM 95th-tile Q	4.5	12	3.3	1.9	1.1	2.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

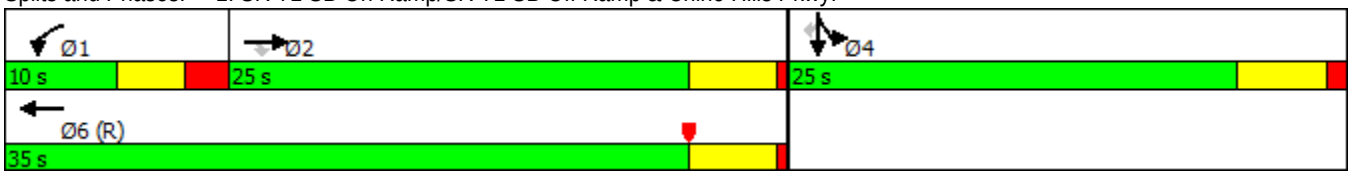
Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	120	255
Future Vol, veh/h	0	0	120	255
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	129	274
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	15.2
HCM LOS	C

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1182	701	18	974	425	240	707
Future Volume (vph)	1182	701	18	974	425	240	707
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.42	0.76	0.14	0.59	0.67	0.63	1.27
Control Delay	11.6	12.2	37.3	9.5	25.3	23.0	153.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	12.2	37.3	9.5	25.3	23.0	153.3
LOS	B	B	D	A	C	C	F
Approach Delay	11.8			10.0		90.7	
Approach LOS	B			A		F	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 36.9	Intersection LOS: D
Intersection Capacity Utilization 82.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1182	701	18	974	0	0	0	0	425	240	707
Future Volume (veh/h)	0	1182	701	18	974	0	0	0	0	425	240	707
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1244	612	19	1025	0				350	389	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2492	607	37	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.05	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1244	612	19	1025	0				350	389	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	9.0	24.1	0.7	0.0	0.0				11.0	11.0	0.0
Cycle Q Clear(g_c), s	0.0	9.0	24.1	0.7	0.0	0.0				11.0	11.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2492	607	37	1739	0				540	600	510
V/C Ratio(X)	0.00	0.50	1.01	0.52	0.59	0.00				0.65	0.65	0.00
Avail Cap(c_a), veh/h	0	2492	607	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.76	0.76	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.4	17.9	28.3	0.0	0.0				17.0	17.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	38.7	3.2	1.1	0.0				5.9	5.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	16.5	0.3	0.3	0.0				5.8	6.3	0.0
LnGrp Delay(d),s/veh	0.0	13.6	56.7	31.5	1.1	0.0				22.9	22.4	0.0
LnGrp LOS		B	F	C	A					C	C	
Approach Vol, veh/h		1856			1044						739	
Approach Delay, s/veh		27.8			1.7						22.6	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.4	28.6		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	26.1		13.0		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.6		22.0		

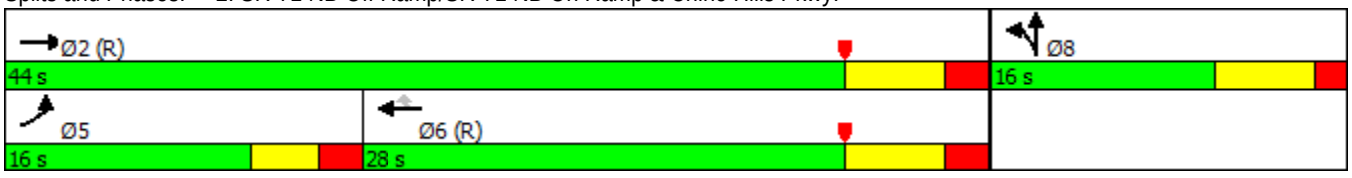
Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	419	1188	634	589	359	108
Future Volume (vph)	419	1188	634	589	359	108
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	37.5	21.5	21.5	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.84	0.60	0.56	0.92	0.79	0.59
Control Delay	39.1	9.5	17.6	33.8	49.7	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	9.5	17.6	33.8	49.7	28.2
LOS	D	A	B	C	D	C
Approach Delay		17.2	25.4			36.4
Approach LOS		B	C			D

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 23.0	Intersection LOS: C
Intersection Capacity Utilization 82.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	419	1188	0	0	634	589	359	108	5	0	0	0
Future Volume (veh/h)	419	1188	0	0	634	589	359	108	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	451	1277	0	0	682	630	386	116	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	536	2138	0	0	1233	544	540	297	3			
Arrive On Green	0.18	0.63	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1782	15			
Grp Volume(v), veh/h	451	1277	0	0	682	630	386	0	117			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	8.8	13.4	0.0	0.0	9.6	21.6	6.8	0.0	3.5			
Cycle Q Clear(g_c), s	8.8	13.4	0.0	0.0	9.6	21.6	6.8	0.0	3.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	536	2138	0	0	1233	544	540	0	300			
V/C Ratio(X)	0.84	0.60	0.00	0.00	0.55	1.16	0.72	0.00	0.39			
Avail Cap(c_a), veh/h	542	2138	0	0	1233	544	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.51	0.51	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.7	6.7	0.0	0.0	15.3	19.2	23.7	0.0	22.3			
Incr Delay (d2), s/veh	10.1	1.1	0.0	0.0	0.9	82.2	7.9	0.0	3.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.3	6.5	0.0	0.0	4.6	21.3	3.6	0.0	2.0			
LnGrp Delay(d),s/veh	33.8	7.8	0.0	0.0	16.2	101.4	31.5	0.0	26.1			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1728			1312			503				
Approach Delay, s/veh		14.6			57.1			30.3				
Approach LOS		B			E			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			15.9	28.1		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		15.4			10.8	23.6		8.8
Green Ext Time (p_c), s		16.6			0.0	0.0		0.3

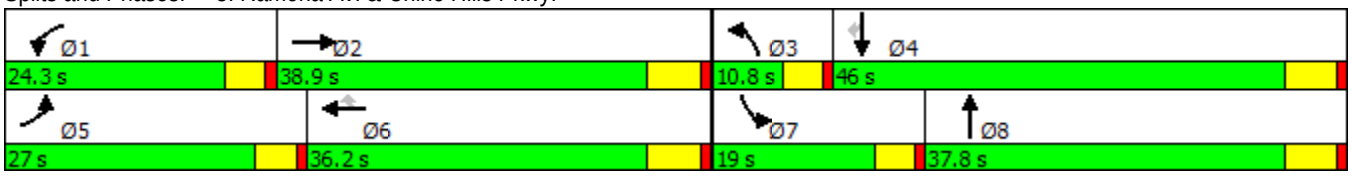
Intersection Summary	
HCM 2010 Ctrl Delay	32.6
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	261	930	145	776	136	22	301	163	472	424
Future Volume (vph)	261	930	145	776	136	22	301	163	472	424
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	21.8	37.0	15.2	30.4	30.4	5.7	32.0	14.0	44.2	44.2
Actuated g/C Ratio	0.18	0.31	0.13	0.26	0.26	0.05	0.27	0.12	0.37	0.37
v/c Ratio	0.94	0.65	0.75	0.95	0.29	0.30	0.51	0.91	0.39	0.53
Control Delay	88.3	38.5	71.7	63.9	6.7	65.0	34.1	97.9	29.8	5.2
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.3	38.9	71.7	63.9	6.7	65.0	34.1	97.9	29.8	5.2
LOS	F	D	E	E	A	E	C	F	C	A
Approach Delay		49.7		57.6			35.6		30.4	
Approach LOS		D		E			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 44.8	Intersection LOS: D
Intersection Capacity Utilization 92.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	930	2	145	776	136	22	301	142	163	472	424
Future Volume (veh/h)	261	930	2	145	776	136	22	301	142	163	472	424
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	278	989	2	154	826	100	23	320	96	173	502	341
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	300	1665	3	179	868	383	36	693	204	195	1248	550
Arrive On Green	0.19	0.33	0.33	0.11	0.25	0.25	0.02	0.27	0.27	0.12	0.36	0.36
Sat Flow, veh/h	1619	5064	10	1619	3420	1509	1619	2596	765	1619	3420	1507
Grp Volume(v), veh/h	278	640	351	154	826	100	23	209	207	173	502	341
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1651	1619	1710	1507
Q Serve(g_s), s	20.2	19.5	19.5	11.2	28.5	6.3	1.7	12.2	12.6	12.6	13.1	22.3
Cycle Q Clear(g_c), s	20.2	19.5	19.5	11.2	28.5	6.3	1.7	12.2	12.6	12.6	13.1	22.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	300	1077	591	179	868	383	36	457	441	195	1248	550
V/C Ratio(X)	0.93	0.59	0.59	0.86	0.95	0.26	0.64	0.46	0.47	0.89	0.40	0.62
Avail Cap(c_a), veh/h	303	1077	591	266	868	383	84	457	441	195	1248	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	33.5	33.5	52.4	44.0	35.7	58.1	36.7	36.8	51.9	28.3	31.2
Incr Delay (d2), s/veh	32.2	1.1	1.9	11.9	20.0	0.5	6.7	3.3	3.6	34.8	1.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	9.0	10.0	5.6	15.8	2.7	0.8	6.2	6.2	7.6	6.4	10.0
LnGrp Delay(d),s/veh	80.2	34.6	35.5	64.3	64.0	36.3	64.8	39.9	40.4	86.8	29.3	36.4
LnGrp LOS	F	C	D	E	E	D	E	D	D	F	C	D
Approach Vol, veh/h		1269			1080			439			1016	
Approach Delay, s/veh		44.8			61.5			41.5			41.5	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	45.2	7.3	49.5	26.8	36.2	19.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	13.2	21.5	3.7	24.3	22.2	30.5	14.6	14.6
Green Ext Time (p_c), s	0.1	9.4	0.0	6.0	0.0	0.0	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	48.3
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	920	127	47	883	92	29
Future Vol, veh/h	920	127	47	883	92	29
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1022	141	52	981	102	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1025	0	1620	514
Stage 1	-	-	-	-	1025	-
Stage 2	-	-	-	-	595	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	685	-	~ 96	511
Stage 1	-	-	-	-	312	-
Stage 2	-	-	-	-	519	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	685	-	~ 88	510
Mov Cap-2 Maneuver	-	-	-	-	259	-
Stage 1	-	-	-	-	311	-
Stage 2	-	-	-	-	480	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	27.2
HCM LOS			D

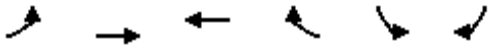
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	294	-	-	685	-
HCM Lane V/C Ratio	0.457	-	-	0.076	-
HCM Control Delay (s)	27.2	-	-	10.7	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.3	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	126	823	684	62	246
Future Volume (vph)	126	823	684	62	246
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	11.4	43.2	27.1	23.6	36.2
Actuated g/C Ratio	0.15	0.55	0.34	0.30	0.46
v/c Ratio	0.59	0.48	0.69	0.08	0.35
Control Delay	43.3	11.3	25.4	23.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	11.3	25.4	23.7	8.4
LOS	D	B	C	C	A
Approach Delay		15.5	25.4	11.4	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 78.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 60.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	126	823	684	64	62	246
Future Volume (veh/h)	126	823	684	64	62	246
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	137	895	743	68	67	81
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	168	2017	1365	125	808	577
Arrive On Green	0.10	0.59	0.43	0.43	0.27	0.27
Sat Flow, veh/h	1619	3510	3252	289	2956	1530
Grp Volume(v), veh/h	137	895	402	409	67	81
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1741	1478	1530
Q Serve(g_s), s	7.0	12.3	14.8	14.8	1.4	3.0
Cycle Q Clear(g_c), s	7.0	12.3	14.8	14.8	1.4	3.0
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	168	2017	738	752	808	577
V/C Ratio(X)	0.81	0.44	0.54	0.54	0.08	0.14
Avail Cap(c_a), veh/h	542	3435	1052	1071	808	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	9.7	17.9	17.9	22.9	17.4
Incr Delay (d2), s/veh	3.6	0.2	0.9	0.9	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	5.8	7.1	7.2	0.6	3.2
LnGrp Delay(d),s/veh	40.8	9.9	18.8	18.8	23.1	17.9
LnGrp LOS	D	A	B	B	C	B
Approach Vol, veh/h		1032	811		148	
Approach Delay, s/veh		14.0	18.8		20.2	
Approach LOS		B	B		C	

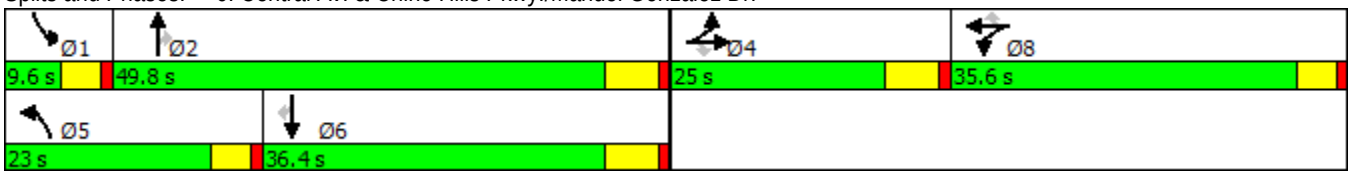
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		55.8		29.0	13.4	42.4		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		14.3		5.0	9.0	16.8		
Green Ext Time (p_c), s		26.7		0.4	0.1	19.8		

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	504	2	420	12	42	34	320	762	1	11	860	236
Future Volume (vph)	504	2	420	12	42	34	320	762	1	11	860	236
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.92	0.87	0.69	0.06	0.19	0.11	1.16	0.46	0.00	0.15	0.89	0.45
Control Delay	78.4	69.0	10.0	37.7	40.3	0.6	141.6	18.8	0.0	54.5	45.7	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	69.0	10.0	37.7	40.3	0.6	141.6	18.8	0.0	54.5	45.7	16.0
LOS	E	E	B	D	D	A	F	B	A	D	D	B
Approach Delay		44.8			24.7			55.1			39.5	
Approach LOS		D			C			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.16	
Intersection Signal Delay: 45.9	Intersection LOS: D
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	504	2	420	12	42	34	320	762	1	11	860	236
Future Volume (veh/h)	504	2	420	12	42	34	320	762	1	11	860	236
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	549	0	329	13	46	20	348	828	1	12	935	187
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	631	0	298	156	173	146	303	1653	739	23	1063	469
Arrive On Green	0.20	0.00	0.20	0.10	0.10	0.10	0.19	0.48	0.48	0.01	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	549	0	329	13	46	20	348	828	1	12	935	187
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	16.2	0.0	19.2	0.7	2.3	1.2	18.4	16.2	0.0	0.7	25.5	9.6
Cycle Q Clear(g_c), s	16.2	0.0	19.2	0.7	2.3	1.2	18.4	16.2	0.0	0.7	25.5	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	631	0	298	156	173	146	303	1653	739	23	1063	469
V/C Ratio(X)	0.87	0.00	1.10	0.08	0.27	0.14	1.15	0.50	0.00	0.52	0.88	0.40
Avail Cap(c_a), veh/h	631	0	298	510	567	479	303	1653	739	82	1063	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	0.0	39.6	40.6	41.3	40.8	40.0	17.3	13.1	48.2	32.2	26.7
Incr Delay (d2), s/veh	12.5	0.0	82.5	0.2	0.8	0.4	98.7	1.1	0.0	6.6	10.4	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	14.9	0.3	1.2	0.5	16.5	7.8	0.0	0.4	13.6	4.3
LnGrp Delay(d),s/veh	50.9	0.0	122.1	40.8	42.1	41.2	138.8	18.4	13.1	54.8	42.6	29.2
LnGrp LOS	D		F	D	D	D	F	B	B	D	D	C
Approach Vol, veh/h		878			79			1177			1134	
Approach Delay, s/veh		77.6			41.6			54.0			40.5	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	53.4		25.0	23.0	36.4		14.1
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	18.2		21.2	20.4	27.5		4.3
Green Ext Time (p_c), s	0.0	18.3		0.0	0.0	2.8		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	55.3
HCM 2010 LOS	E

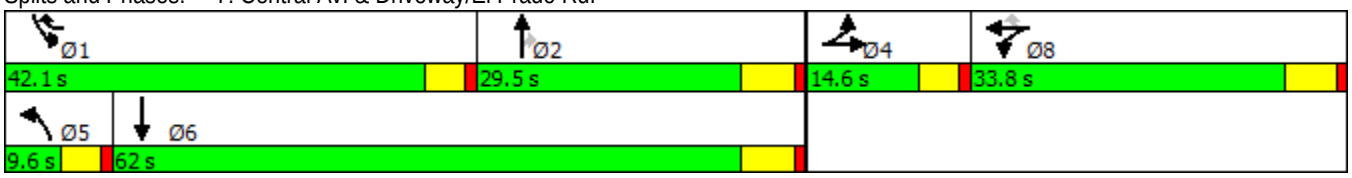
Notes

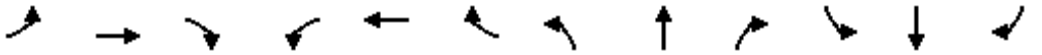
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	27	5	739	4	464	9	583	834	577	723
Future Volume (vph)	27	5	739	4	464	9	583	834	577	723
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	28.1	28.1	71.5	5.0	23.8	23.8	37.6	64.1
Actuated g/C Ratio	0.09	0.09	0.24	0.24	0.61	0.04	0.20	0.20	0.32	0.55
v/c Ratio	0.20	0.17	1.05	0.99	0.47	0.13	0.87	1.09	1.16	0.29
Control Delay	55.2	26.0	104.5	90.2	8.4	59.8	60.7	74.9	129.0	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	26.0	104.5	90.2	8.4	59.8	60.7	74.9	129.0	15.5
LOS	E	C	F	F	A	E	E	E	F	B
Approach Delay		40.9		63.2			69.0			65.2
Approach LOS		D		E			E			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 117.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 65.6 — Intersection LOS: E
Intersection Capacity Utilization 111.2% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	5	21	739	4	464	9	583	834	577	723	18
Future Volume (veh/h)	27	5	21	739	4	464	9	583	834	577	723	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	28	5	13	773	0	332	9	607	693	601	753	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	107	29	76	770	0	851	18	688	303	515	2522	50
Arrive On Green	0.07	0.07	0.07	0.24	0.00	0.24	0.01	0.20	0.20	0.32	0.51	0.51
Sat Flow, veh/h	1619	443	1153	3238	0	1530	1619	3420	1508	1619	4958	99
Grp Volume(v), veh/h	28	0	18	773	0	332	9	607	693	601	497	271
Grp Sat Flow(s),veh/h/ln	1619	0	1597	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.9	0.0	1.3	28.0	0.0	14.5	0.7	20.3	23.7	37.5	10.4	10.4
Cycle Q Clear(g_c), s	1.9	0.0	1.3	28.0	0.0	14.5	0.7	20.3	23.7	37.5	10.4	10.4
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	107	0	105	770	0	851	18	688	303	515	1667	906
V/C Ratio(X)	0.26	0.00	0.17	1.00	0.00	0.39	0.51	0.88	2.28	1.17	0.30	0.30
Avail Cap(c_a), veh/h	137	0	136	770	0	851	69	688	303	515	1667	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	0.0	52.0	44.9	0.0	14.8	57.9	45.7	47.0	40.1	16.8	16.8
Incr Delay (d2), s/veh	0.5	0.0	0.3	33.5	0.0	0.3	8.4	15.2	588.3	94.1	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.6	16.0	0.0	6.2	0.3	11.1	59.4	30.1	4.8	5.3
LnGrp Delay(d),s/veh	52.7	0.0	52.2	78.4	0.0	15.1	66.3	60.9	635.3	134.3	17.2	17.6
LnGrp LOS	D		D	F		B	E	E	F	F	B	B
Approach Vol, veh/h		46			1105			1309			1369	
Approach Delay, s/veh		52.5			59.4			365.0			68.7	
Approach LOS		D			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.4	5.9	65.7		33.8
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.5	25.7		3.9	2.7	12.4		30.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	25.3		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		167.1
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1309	911	161
Future Volume (vph)	1309	911	161
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	85.3	85.3	25.2
Actuated g/C Ratio	0.71	0.71	0.21
v/c Ratio	0.52	0.27	1.06dr
Control Delay	5.6	6.9	52.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.6	6.9	52.2
LOS	A	A	D
Approach Delay	5.6	6.9	52.2
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 61.2%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1309	389	0	911	161	348
Future Volume (veh/h)	1309	389	0	911	161	348
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1378	409	0	959	169	205
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2895	855	0	3777	246	233
Arrive On Green	1.00	1.00	0.00	0.77	0.15	0.15
Sat Flow, veh/h	3929	1113	0	5238	1619	1530
Grp Volume(v), veh/h	1198	589	0	959	169	205
Grp Sat Flow(s),veh/h/ln	1638	1604	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	6.7	11.9	15.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.7	11.9	15.7
Prop In Lane		0.69	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2518	1233	0	3777	246	233
V/C Ratio(X)	0.48	0.48	0.00	0.25	0.69	0.88
Avail Cap(c_a), veh/h	2518	1233	0	3777	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.0	48.1	49.8
Incr Delay (d2), s/veh	0.6	1.3	0.0	0.2	1.3	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.0	3.1	5.4	6.9
LnGrp Delay(d),s/veh	0.6	1.3	0.0	4.2	49.4	54.0
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1787			959	374	
Approach Delay, s/veh	0.9			4.2	51.9	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		96.7				96.7		23.3
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				8.7		17.7
Green Ext Time (p_c), s		22.5				21.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	730	90	716	968	0
Future Volume (vph)	730	90	716	968	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	31.5	31.5	31.5	80.5	80.5
Actuated g/C Ratio	0.26	0.26	0.26	0.67	0.67
v/c Ratio	0.57	0.20	0.83	0.86	0.91
Control Delay	40.8	8.1	43.8	25.3	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	8.1	43.8	25.3	30.6
LOS	D	A	D	C	C
Approach Delay	37.2		43.8		28.0
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 34.7	Intersection LOS: C
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	730	90	0	716	356	0	0	0	968	0	797
Future Volume (veh/h)	0	730	90	0	716	356	0	0	0	968	0	797
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	737	0	0	723	360				828	209	679
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1699	529	0	1133	529				951	219	713
Arrive On Green	0.00	0.35	0.00	0.00	0.11	0.11				0.59	0.59	0.59
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	373	1213
Grp Volume(v), veh/h	0	737	0	0	723	360				828	0	888
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1586
Q Serve(g_s), s	0.0	13.9	0.0	0.0	25.3	27.1				51.8	0.0	63.0
Cycle Q Clear(g_c), s	0.0	13.9	0.0	0.0	25.3	27.1				51.8	0.0	63.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.76
Lane Grp Cap(c), veh/h	0	1699	529	0	1133	529				951	0	932
V/C Ratio(X)	0.00	0.43	0.00	0.00	0.64	0.68				0.87	0.00	0.95
Avail Cap(c_a), veh/h	0	1699	529	0	1133	529				1100	0	1077
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.2	0.0	0.0	46.0	46.8				20.9	0.0	23.2
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.0	2.8	6.9				6.3	0.0	15.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.4	0.0	0.0	11.9	12.5				24.7	0.0	31.4
LnGrp Delay(d),s/veh	0.0	31.0	0.0	0.0	48.7	53.7				27.1	0.0	38.5
LnGrp LOS		C			D	D				C		D
Approach Vol, veh/h		737			1083						1716	
Approach Delay, s/veh		31.0			50.4						33.0	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		46.0		74.0		46.0		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		15.9		65.0		29.1		
Green Ext Time (p_c), s		8.3		5.5		1.1		

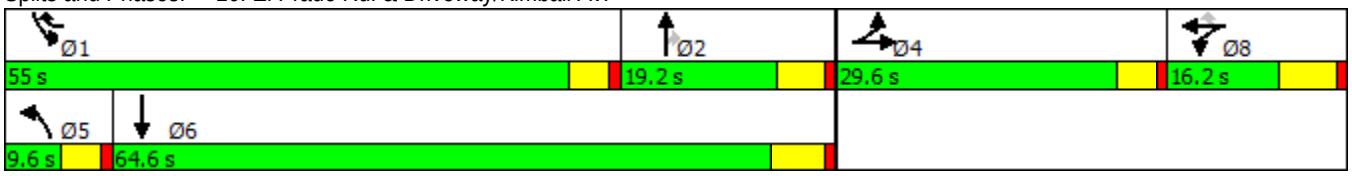
Intersection Summary	
HCM 2010 Ctrl Delay	37.9
HCM 2010 LOS	D

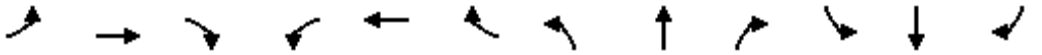
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	36	8	3	844	4	206	24	994	359
Future Volume (vph)	36	8	3	844	4	206	24	994	359
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.18	0.07	0.14	0.75	0.05	0.79	0.07	1.18	0.18
Control Delay	42.8	29.8	48.4	9.2	53.2	64.8	0.4	119.2	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	29.8	48.4	9.2	53.2	64.8	0.4	119.2	10.8
LOS	D	C	D	A	D	E	A	F	B
Approach Delay		39.0	10.4			58.1			89.6
Approach LOS		D	B			E			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 58.3	Intersection LOS: E
Intersection Capacity Utilization 94.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	8	8	23	3	844	4	206	24	994	359	14
Future Volume (veh/h)	36	8	8	23	3	844	4	206	24	994	359	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	38	8	6	24	3	437	4	217	24	1046	378	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	121	72	54	148	19	894	78	244	207	790	1933	71
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.05	0.14	0.14	0.49	0.57	0.57
Sat Flow, veh/h	1619	956	717	1532	191	1530	1619	1800	1530	1619	3363	124
Grp Volume(v), veh/h	38	0	14	27	0	437	4	217	24	1046	192	200
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1723	0	1530	1619	1800	1530	1619	1710	1778
Q Serve(g_s), s	2.3	0.0	0.8	1.5	0.0	10.0	0.2	12.2	1.4	50.4	5.6	5.6
Cycle Q Clear(g_c), s	2.3	0.0	0.8	1.5	0.0	10.0	0.2	12.2	1.4	50.4	5.6	5.6
Prop In Lane	1.00		0.43	0.89		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	121	0	126	167	0	894	78	244	207	790	983	1022
V/C Ratio(X)	0.31	0.00	0.11	0.16	0.00	0.49	0.05	0.89	0.12	1.32	0.20	0.20
Avail Cap(c_a), veh/h	392	0	405	167	0	894	78	244	207	790	983	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	44.6	42.8	0.0	12.5	46.9	43.9	39.2	26.5	10.5	10.5
Incr Delay (d2), s/veh	1.5	0.0	0.4	0.5	0.0	0.4	0.1	30.6	0.2	154.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.4	0.7	0.0	7.3	0.1	8.2	0.6	56.4	2.6	2.8
LnGrp Delay(d),s/veh	46.7	0.0	45.0	43.3	0.0	12.9	47.0	74.5	39.5	181.4	10.6	10.6
LnGrp LOS	D		D	D		B	D	E	D	F	B	B
Approach Vol, veh/h		52			464			245			1438	
Approach Delay, s/veh		46.3			14.7			70.6			134.9	
Approach LOS		D			B			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.8		12.4	9.6	65.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	14.2		4.3	2.2	7.6		12.0
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	3.6		0.0

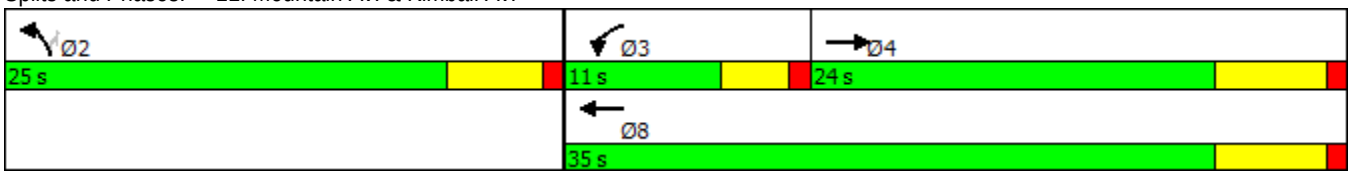
Intersection Summary		
HCM 2010 Ctrl Delay		100.2
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1029	50	719	148	143
Future Volume (vph)	1029	50	719	148	143
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	18.7	7.3	22.3	10.0	10.0
Actuated g/C Ratio	0.42	0.17	0.51	0.23	0.23
v/c Ratio	0.85	0.21	0.46	0.45	0.34
Control Delay	23.8	21.9	8.3	19.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	21.9	8.3	19.8	5.7
LOS	C	C	A	B	A
Approach Delay	23.8		9.2	12.9	
Approach LOS	C		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1029	93	50	719	148	143
Future Volume (veh/h)	1029	93	50	719	148	143
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1131	100	55	790	163	134
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1285	114	127	1968	263	249
Arrive On Green	0.40	0.40	0.08	0.58	0.16	0.16
Sat Flow, veh/h	3270	281	1619	3510	1619	1530
Grp Volume(v), veh/h	608	623	55	790	163	134
Grp Sat Flow(s),veh/h/ln	1710	1750	1619	1710	1619	1530
Q Serve(g_s), s	14.2	14.2	1.4	5.5	4.0	3.5
Cycle Q Clear(g_c), s	14.2	14.2	1.4	5.5	4.0	3.5
Prop In Lane		0.16	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	691	708	127	1968	263	249
V/C Ratio(X)	0.88	0.88	0.43	0.40	0.62	0.54
Avail Cap(c_a), veh/h	714	731	263	2301	740	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	11.9	18.9	5.1	16.8	16.6
Incr Delay (d2), s/veh	11.4	11.3	0.9	0.0	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	9.0	0.7	2.5	1.9	1.5
LnGrp Delay(d),s/veh	23.2	23.2	19.8	5.1	17.7	17.2
LnGrp LOS	C	C	B	A	B	B
Approach Vol, veh/h	1231			845	297	
Approach Delay, s/veh	23.2			6.1	17.5	
Approach LOS	C			A	B	

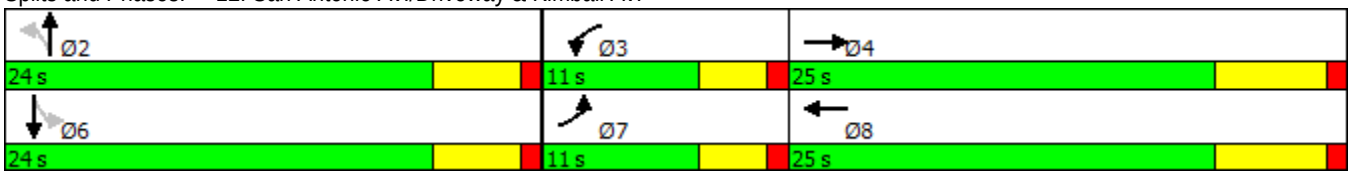
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	7.4	23.4				30.8
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		6.0	3.4	16.2				7.5
Green Ext Time (p_c), s		0.2	0.0	1.2				6.2

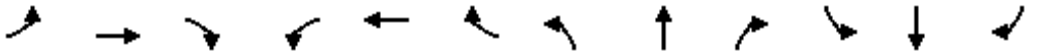
Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	25	1128	15	703	65	0	76	0
Future Volume (vph)	25	1128	15	703	65	0	76	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	25.0	11.0	25.0	24.0	24.0	24.0	24.0
Total Split (%)	18.3%	41.7%	18.3%	41.7%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	19.7	7.2	19.7	9.1	9.1	9.1	9.1
Actuated g/C Ratio	0.17	0.47	0.17	0.47	0.22	0.22	0.22	0.22
v/c Ratio	0.09	0.76	0.06	0.47	0.24	0.03	0.29	0.02
Control Delay	19.0	16.9	18.8	10.4	16.2	0.1	17.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	16.9	18.8	10.4	16.2	0.1	17.0	0.0
LOS	B	B	B	B	B	A	B	A
Approach Delay		17.0		10.6		12.7		15.2
Approach LOS		B		B		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 41.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 54.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1128	42	15	703	12	65	0	18	76	0	9
Future Volume (veh/h)	25	1128	42	15	703	12	65	0	18	76	0	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	1187	44	16	740	13	68	0	17	80	0	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	1430	53	46	1408	25	409	0	267	401	0	267
Arrive On Green	0.04	0.43	0.43	0.03	0.41	0.41	0.17	0.00	0.17	0.17	0.00	0.17
Sat Flow, veh/h	1619	3363	125	1619	3437	60	1349	0	1530	1339	0	1530
Grp Volume(v), veh/h	26	603	628	16	368	385	68	0	17	80	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1778	1619	1710	1788	1349	0	1530	1339	0	1530
Q Serve(g_s), s	0.6	12.6	12.6	0.4	6.5	6.5	1.8	0.0	0.4	2.1	0.0	0.2
Cycle Q Clear(g_c), s	0.6	12.6	12.6	0.4	6.5	6.5	2.0	0.0	0.4	2.5	0.0	0.2
Prop In Lane	1.00		0.07	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	727	756	46	700	732	409	0	267	401	0	267
V/C Ratio(X)	0.37	0.83	0.83	0.35	0.53	0.53	0.17	0.00	0.06	0.20	0.00	0.03
Avail Cap(c_a), veh/h	283	811	843	283	811	848	816	0	729	806	0	729
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.6	10.2	10.2	19.1	8.9	8.9	14.5	0.0	13.8	14.8	0.0	13.7
Incr Delay (d2), s/veh	1.2	5.9	5.8	1.6	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.1	7.3	0.2	3.0	3.1	0.7	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	19.8	16.2	16.0	20.7	9.1	9.1	14.6	0.0	13.8	14.9	0.0	13.7
LnGrp LOS	B	B	B	C	A	A	B		B	B		B
Approach Vol, veh/h		1257			769			85			89	
Approach Delay, s/veh		16.2			9.4			14.5			14.8	
Approach LOS		B			A			B			B	

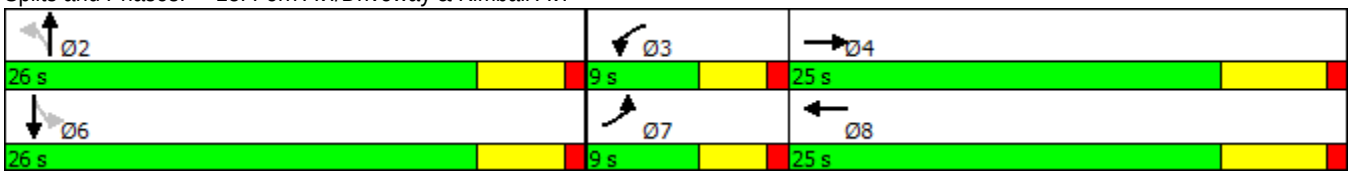
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.1	23.0		11.9	5.8	22.4
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		4.0	2.4	14.6		4.5	2.6	8.5
Green Ext Time (p_c), s		0.2	0.0	2.5		0.2	0.0	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1194	12	644	48	1	189	7
Future Volume (vph)	20	1194	12	644	48	1	189	7
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	19.9	5.2	19.9	11.4	11.4	11.4	11.4
Actuated g/C Ratio	0.12	0.46	0.12	0.46	0.26	0.26	0.26	0.26
v/c Ratio	0.12	0.89	0.07	0.48	0.17	0.10	0.66	0.11
Control Delay	22.9	23.7	22.3	11.5	13.7	5.6	25.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	23.7	22.3	11.5	13.7	5.6	25.1	6.5
LOS	C	C	C	B	B	A	C	A
Approach Delay		23.7		11.7		10.0		21.8
Approach LOS		C		B		B		C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1194	22	12	644	11	48	1	39	189	7	34
Future Volume (veh/h)	20	1194	22	12	644	11	48	1	39	189	7	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	23	1357	19	14	732	12	55	1	24	215	8	21
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	45	1489	21	29	1450	24	435	13	324	438	97	253
Arrive On Green	0.03	0.43	0.43	0.02	0.42	0.42	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1619	3452	48	1619	3442	56	1325	62	1478	1330	440	1156
Grp Volume(v), veh/h	23	672	704	14	364	380	55	0	25	215	0	29
Grp Sat Flow(s),veh/h/ln	1619	1710	1790	1619	1710	1789	1325	0	1539	1330	0	1596
Q Serve(g_s), s	0.6	16.2	16.2	0.4	6.9	6.9	1.5	0.0	0.6	6.7	0.0	0.6
Cycle Q Clear(g_c), s	0.6	16.2	16.2	0.4	6.9	6.9	2.2	0.0	0.6	7.3	0.0	0.6
Prop In Lane	1.00		0.03	1.00		0.03	1.00		0.96	1.00		0.72
Lane Grp Cap(c), veh/h	45	737	772	29	720	754	435	0	337	438	0	350
V/C Ratio(X)	0.51	0.91	0.91	0.48	0.50	0.50	0.13	0.00	0.07	0.49	0.00	0.08
Avail Cap(c_a), veh/h	184	750	785	184	750	784	779	0	738	784	0	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	11.7	11.7	21.4	9.4	9.4	14.5	0.0	13.6	16.5	0.0	13.7
Incr Delay (d2), s/veh	3.3	14.8	14.4	4.6	0.2	0.2	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	10.5	10.9	0.2	3.3	3.4	0.6	0.0	0.2	2.5	0.0	0.3
LnGrp Delay(d),s/veh	24.4	26.5	26.1	26.0	9.6	9.6	14.6	0.0	13.7	16.9	0.0	13.7
LnGrp LOS	C	C	C	C	A	A	B		B	B		B
Approach Vol, veh/h		1399			758			80			244	
Approach Delay, s/veh		26.3			9.9			14.3			16.5	
Approach LOS		C			A			B			B	

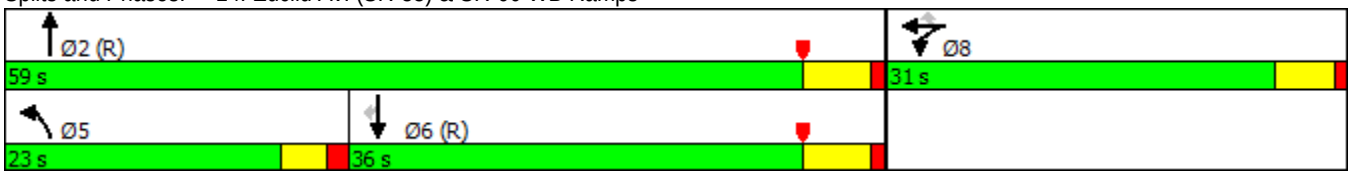
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.6	4.8	24.7		14.6	5.2	24.2
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		4.2	2.4	18.2		9.3	2.6	8.9
Green Ext Time (p_c), s		0.4	0.0	0.8		0.3	0.0	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	19.9
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	640	6	422	528	1074	946	549
Future Volume (vph)	640	6	422	528	1074	946	549
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.9	24.9	24.9	19.6	54.6	30.5	30.5
Actuated g/C Ratio	0.28	0.28	0.28	0.22	0.61	0.34	0.34
v/c Ratio	0.92	0.89	0.77	1.58	0.54	0.86	0.66
Control Delay	61.0	53.3	34.6	289.4	23.0	36.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	3.3	0.0	0.0
Total Delay	61.0	53.3	34.6	289.4	26.3	36.9	6.1
LOS	E	D	C	F	C	D	A
Approach Delay		50.2			113.1	25.6	
Approach LOS		D			F	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.58	
Intersection Signal Delay: 65.5	Intersection LOS: E
Intersection Capacity Utilization 111.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	640	6	422	528	1074	0	0	946	549
Future Volume (veh/h)	0	0	0	640	6	422	528	1074	0	0	946	549
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				766	0	195	556	1131	0	0	996	578
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				844	0	394	333	2129	0	0	1255	543
Arrive On Green				0.26	0.00	0.26	0.41	1.00	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1481
Grp Volume(v), veh/h				766	0	195	556	1131	0	0	996	578
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1481
Q Serve(g_s), s				20.6	0.0	9.9	18.5	0.0	0.0	0.0	23.4	33.0
Cycle Q Clear(g_c), s				20.6	0.0	9.9	18.5	0.0	0.0	0.0	23.4	33.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				844	0	394	333	2129	0	0	1255	543
V/C Ratio(X)				0.91	0.00	0.50	1.67	0.53	0.00	0.00	0.79	1.06
Avail Cap(c_a), veh/h				935	0	436	333	2129	0	0	1255	543
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.2	0.0	28.2	26.5	0.0	0.0	0.0	25.4	28.5
Incr Delay (d2), s/veh				11.0	0.0	0.4	303.0	0.1	0.0	0.0	5.2	56.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.4	0.0	4.2	36.1	0.0	0.0	0.0	12.0	22.0
LnGrp Delay(d),s/veh				43.2	0.0	28.6	329.5	0.1	0.0	0.0	30.7	85.1
LnGrp LOS				D		C	F	A			C	F
Approach Vol, veh/h					961			1687			1574	
Approach Delay, s/veh					40.2			108.7			50.7	
Approach LOS					D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.5			23.0	38.5		28.5
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			20.5	35.0		22.6
Green Ext Time (p_c), s		41.0			0.0	0.0		0.9

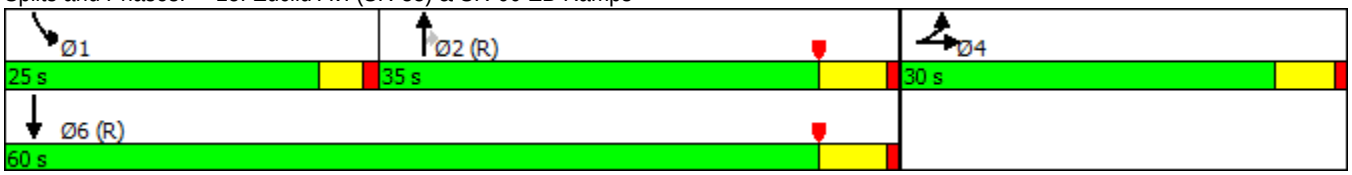
Intersection Summary	
HCM 2010 Ctrl Delay	71.5
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	392	2	1211	758	313	1273
Future Volume (vph)	392	2	1211	758	313	1273
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	25.0	25.0	30.7	30.7	19.8	54.5
Actuated g/C Ratio	0.28	0.28	0.34	0.34	0.22	0.61
v/c Ratio	0.85	1.34	1.06	0.82	0.90	0.63
Control Delay	50.5	196.5	74.5	13.0	52.3	5.3
Queue Delay	30.3	1.8	0.0	0.0	0.0	1.0
Total Delay	80.9	198.3	74.5	13.0	52.3	6.2
LOS	F	F	E	B	D	A
Approach Delay		154.5	50.8			15.3
Approach LOS		F	D			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 60.1	Intersection LOS: E
Intersection Capacity Utilization 111.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	392	2	552	0	0	0	0	1211	758	313	1273	0
Future Volume (veh/h)	392	2	552	0	0	0	0	1211	758	313	1273	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	400	2	486				0	1236	773	319	1299	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	450	2	424				0	1186	515	347	2071	0
Arrive On Green	0.28	0.28	0.28				0.00	0.35	0.35	0.28	0.81	0.00
Sat Flow, veh/h	1619	6	1525				0	3510	1484	1619	3510	0
Grp Volume(v), veh/h	400	0	488				0	1236	773	319	1299	0
Grp Sat Flow(s),veh/h/ln	1619	0	1531				0	1710	1484	1619	1710	0
Q Serve(g_s), s	21.3	0.0	25.0				0.0	31.2	31.2	17.2	13.4	0.0
Cycle Q Clear(g_c), s	21.3	0.0	25.0				0.0	31.2	31.2	17.2	13.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	450	0	425				0	1186	515	347	2071	0
V/C Ratio(X)	0.89	0.00	1.15				0.00	1.04	1.50	0.92	0.63	0.00
Avail Cap(c_a), veh/h	450	0	425				0	1186	515	378	2071	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.62	0.62	0.36	0.36	0.00
Uniform Delay (d), s/veh	31.2	0.0	32.5				0.0	29.4	29.4	31.4	4.8	0.0
Incr Delay (d2), s/veh	18.7	0.0	90.5				0.0	32.4	232.1	11.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	0.0	21.2				0.0	20.0	45.9	8.7	6.1	0.0
LnGrp Delay(d),s/veh	49.8	0.0	123.0				0.0	61.8	261.5	43.0	5.3	0.0
LnGrp LOS	D		F					F	F	D	A	
Approach Vol, veh/h		888						2009			1618	
Approach Delay, s/veh		90.1						138.6			12.7	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.3	36.7		30.0		60.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	19.2	33.2		27.0		15.4		
Green Ext Time (p_c), s	0.1	0.0		0.0		36.4		

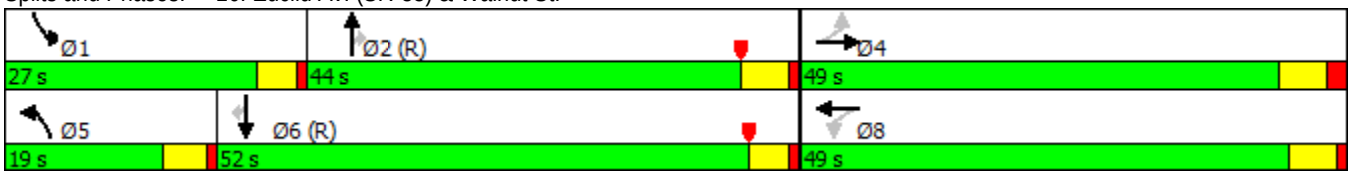
Intersection Summary		
HCM 2010 Ctrl Delay		84.0
HCM 2010 LOS		F

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	126	327	99	284	133	1634	66	331	1346	140
Future Volume (vph)	126	327	99	284	133	1634	66	331	1346	140
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	49.0	49.0	49.0	49.0	19.0	44.0	44.0	27.0	52.0	52.0
Total Split (%)	40.8%	40.8%	40.8%	40.8%	15.8%	36.7%	36.7%	22.5%	43.3%	43.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	27.6	27.6	28.6	28.6	15.0	58.1	58.1	18.3	61.8	61.8
Actuated g/C Ratio	0.23	0.23	0.24	0.24	0.12	0.48	0.48	0.15	0.52	0.52
v/c Ratio	0.92	0.62	0.80	0.52	0.69	0.72	0.09	0.77	0.55	0.17
Control Delay	101.6	38.0	80.8	34.4	78.1	8.9	0.4	60.3	22.9	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.6	38.0	80.8	34.4	78.1	8.9	0.4	60.3	22.9	4.1
LOS	F	D	F	C	E	A	A	E	C	A
Approach Delay		51.4		43.5		13.7			28.2	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 85.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	327	146	99	284	124	133	1634	66	331	1346	140
Future Volume (veh/h)	126	327	146	99	284	124	133	1634	66	331	1346	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	131	341	121	103	296	108	139	1702	46	345	1402	87
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	238	717	250	215	713	255	162	2173	667	397	2324	722
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.13	0.59	0.59	0.13	0.47	0.47
Sat Flow, veh/h	938	2478	864	892	2464	880	1619	4914	1508	2956	4914	1526
Grp Volume(v), veh/h	131	233	229	103	203	201	139	1702	46	345	1402	87
Grp Sat Flow(s),veh/h/ln	938	1710	1632	892	1710	1634	1619	1638	1508	1478	1638	1526
Q Serve(g_s), s	15.8	13.5	13.9	12.9	11.5	11.9	10.1	31.7	1.6	13.7	25.2	3.8
Cycle Q Clear(g_c), s	27.7	13.5	13.9	26.8	11.5	11.9	10.1	31.7	1.6	13.7	25.2	3.8
Prop In Lane	1.00		0.53	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	495	472	215	495	473	162	2173	667	397	2324	722
V/C Ratio(X)	0.55	0.47	0.48	0.48	0.41	0.42	0.86	0.78	0.07	0.87	0.60	0.12
Avail Cap(c_a), veh/h	300	608	581	282	623	595	190	2173	667	554	2324	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.74	0.74	0.74
Uniform Delay (d), s/veh	45.8	35.1	35.2	46.3	34.4	34.5	51.2	20.3	14.1	50.9	23.3	17.7
Incr Delay (d2), s/veh	2.0	0.7	0.8	1.7	0.5	0.6	3.3	0.3	0.0	6.1	0.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	6.5	6.4	3.3	5.5	5.5	4.6	14.1	0.7	5.9	11.6	1.7
LnGrp Delay(d),s/veh	47.7	35.8	36.0	48.0	34.9	35.1	54.5	20.6	14.1	57.1	24.2	17.9
LnGrp LOS	D	D	D	D	C	D	D	C	B	E	C	B
Approach Vol, veh/h		593			507			1887			1834	
Approach Delay, s/veh		38.5			37.7			22.9			30.1	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.6	58.4		41.0	16.9	62.1		41.0
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	22.5	38.7		42.7	14.1	* 48		* 44
Max Q Clear Time (g_c+I1), s	15.7	33.7		29.7	12.1	27.2		28.8
Green Ext Time (p_c), s	0.4	4.7		5.0	0.1	17.2		5.4

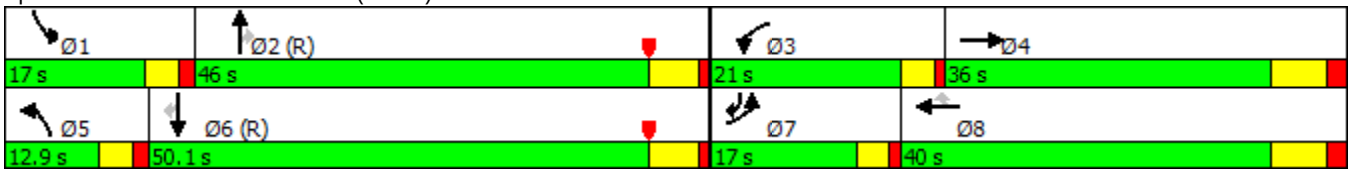
Intersection Summary	
HCM 2010 Ctrl Delay	29.1
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	152	391	178	351	56	108	1513	278	132	1193	168
Future Volume (vph)	152	391	178	351	56	108	1513	278	132	1193	168
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.0	24.4	16.2	27.6	27.6	12.2	44.5	44.5	13.9	46.2	60.7
Actuated g/C Ratio	0.11	0.20	0.14	0.23	0.23	0.10	0.37	0.37	0.12	0.38	0.51
v/c Ratio	0.94	0.75	0.88	0.48	0.14	0.71	1.28	0.44	0.76	0.97	0.21
Control Delay	107.0	49.8	87.6	41.4	2.2	56.5	172.2	27.2	59.7	56.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.0	49.8	87.6	41.4	2.2	56.5	172.2	27.2	59.7	56.8	12.8
LOS	F	D	F	D	A	E	F	C	E	E	B
Approach Delay		63.5		51.7			144.4			52.1	
Approach LOS		E		D			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 91.6	Intersection LOS: F
Intersection Capacity Utilization 95.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	391	91	178	351	56	108	1513	278	132	1193	168
Future Volume (veh/h)	152	391	91	178	351	56	108	1513	278	132	1193	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	163	420	64	191	377	60	116	1627	168	142	1283	83
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	573	87	215	741	327	113	1358	607	167	1471	814
Arrive On Green	0.11	0.19	0.19	0.13	0.22	0.22	0.02	0.13	0.13	0.03	0.14	0.14
Sat Flow, veh/h	1619	2979	451	1619	3420	1507	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	163	240	244	191	377	60	116	1627	168	142	1283	83
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	1507	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	12.0	15.8	16.0	13.9	11.6	3.9	8.4	47.6	11.9	10.5	44.1	4.7
Cycle Q Clear(g_c), s	12.0	15.8	16.0	13.9	11.6	3.9	8.4	47.6	11.9	10.5	44.1	4.7
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	329	331	215	741	327	113	1358	607	167	1471	814
V/C Ratio(X)	0.93	0.73	0.74	0.89	0.51	0.18	1.02	1.20	0.28	0.85	0.87	0.10
Avail Cap(c_a), veh/h	175	413	416	229	941	414	113	1358	607	169	1471	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.46	0.46	0.46	0.80	0.80	0.80
Uniform Delay (d), s/veh	53.0	45.5	45.6	51.2	41.4	38.3	58.6	52.1	36.6	57.0	48.3	20.9
Incr Delay (d2), s/veh	47.2	5.9	6.2	29.3	0.8	0.4	63.7	92.8	0.5	26.7	6.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	8.0	8.2	8.0	5.6	1.7	5.8	40.1	5.1	5.9	22.2	2.0
LnGrp Delay(d),s/veh	100.3	51.4	51.8	80.5	42.1	38.7	122.6	145.0	37.1	83.8	54.3	21.1
LnGrp LOS	F	D	D	F	D	D	F	F	D	F	D	C
Approach Vol, veh/h		647			628			1911			1508	
Approach Delay, s/veh		63.9			53.5			134.1			55.3	
Approach LOS		E			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	53.1	19.9	30.1	12.9	57.1	17.0	33.0
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	12.5	49.6	15.9	18.0	10.4	46.1	14.0	13.6
Green Ext Time (p_c), s	0.0	0.0	0.0	5.1	0.0	0.0	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	88.3
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	71	176	49	73	98	62	1848	213	15	1334	64
Future Volume (vph)	71	176	49	73	98	62	1848	213	15	1334	64
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	9.0	70.8	70.8	9.2	71.0	71.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	7.5%	59.0%	59.0%	7.7%	59.2%	59.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	23.4	23.4	23.4		23.4	8.8	79.8	79.8	5.5	71.4	71.4
Actuated g/C Ratio	0.20	0.20	0.20		0.20	0.07	0.66	0.66	0.05	0.60	0.60
v/c Ratio	0.41	0.52	0.15		0.86	0.55	0.84	0.21	0.20	0.68	0.07
Control Delay	47.0	47.2	8.1		74.7	56.9	25.0	6.9	80.3	4.8	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	47.2	8.1		74.7	56.9	25.0	6.9	80.3	4.8	0.1
LOS	D	D	A		E	E	C	A	F	A	A
Approach Delay		40.6			74.7		24.1			5.3	
Approach LOS		D			E		C			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 21.2	Intersection LOS: C
Intersection Capacity Utilization 95.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	176	49	73	98	24	62	1848	213	15	1334	64
Future Volume (veh/h)	71	176	49	73	98	24	62	1848	213	15	1334	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	73	181	32	75	101	21	64	1905	164	15	1375	37
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	386	328	113	139	25	74	2160	966	27	2059	902
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.09	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1218	1800	1530	333	648	117	1619	3420	1530	1619	3420	1498
Grp Volume(v), veh/h	73	181	32	197	0	0	64	1905	164	15	1375	37
Grp Sat Flow(s),veh/h/ln	1218	1800	1530	1098	0	0	1619	1710	1530	1619	1710	1498
Q Serve(g_s), s	0.0	10.5	2.0	11.6	0.0	0.0	4.7	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	11.3	10.5	2.0	22.1	0.0	0.0	4.7	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	386	328	277	0	0	74	2160	966	27	2059	902
V/C Ratio(X)	0.33	0.47	0.10	0.71	0.00	0.00	0.86	0.88	0.17	0.57	0.67	0.04
Avail Cap(c_a), veh/h	296	495	421	366	0	0	74	2160	966	77	2059	902
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.18	0.18	0.18
Uniform Delay (d), s/veh	41.4	41.2	37.8	47.3	0.0	0.0	54.1	0.0	0.0	57.6	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.9	0.1	4.3	0.0	0.0	8.9	0.6	0.0	1.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.3	0.9	6.7	0.0	0.0	2.3	0.2	0.0	0.5	0.1	0.0
LnGrp Delay(d),s/veh	42.3	42.0	37.9	51.5	0.0	0.0	63.1	0.6	0.0	58.9	0.3	0.0
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		286			197			2133			1427	
Approach Delay, s/veh		41.6			51.5			2.4			0.9	
Approach LOS		D			D			A			A	

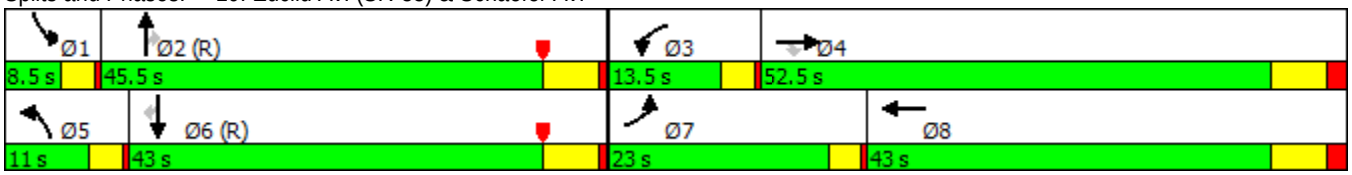
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	81.8		32.7	9.0	78.3		32.7
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	64.8		33.0	5.5	65.0		33.0
Max Q Clear Time (g_c+I1), s	3.1	2.0		13.3	6.7	2.0		24.1
Green Ext Time (p_c), s	0.0	49.8		2.3	0.0	49.9		1.6

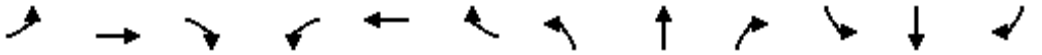
Intersection Summary	
HCM 2010 Ctrl Delay	7.0
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	306	230	189	27	50	120	1819	41	23	1323	134
Future Volume (vph)	306	230	189	27	50	120	1819	41	23	1323	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	27.3	27.3	10.0	14.8	16.2	65.8	65.8	5.7	51.9	51.9
Actuated g/C Ratio	0.16	0.23	0.23	0.08	0.12	0.14	0.55	0.55	0.05	0.43	0.43
v/c Ratio	1.20	0.58	0.39	0.21	0.30	0.57	1.00	0.05	0.32	0.92	0.19
Control Delay	164.8	45.8	6.4	55.4	38.6	43.4	41.3	2.6	73.7	34.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	164.8	45.8	6.4	55.4	38.6	43.4	41.3	2.6	73.7	34.6	5.4
LOS	F	D	A	E	D	D	D	A	E	C	A
Approach Delay		85.7			43.6		40.6			32.5	
Approach LOS		F			D		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 45.5	Intersection LOS: D
Intersection Capacity Utilization 97.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	230	189	27	50	15	120	1819	41	23	1323	134
Future Volume (veh/h)	306	230	189	27	50	15	120	1819	41	23	1323	134
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	315	237	119	28	52	10	124	1875	33	24	1364	85
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	316	269	82	93	18	101	1998	894	37	1863	815
Arrive On Green	0.16	0.18	0.18	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1468	282	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	315	237	119	28	0	62	124	1875	33	24	1364	85
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1750	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	15.0	8.3	2.0	0.0	4.1	7.5	64.8	2.1	1.8	45.2	5.7
Cycle Q Clear(g_c), s	19.5	15.0	8.3	2.0	0.0	4.1	7.5	64.8	2.1	1.8	45.2	5.7
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	316	269	82	0	111	101	1998	894	37	1863	815
V/C Ratio(X)	1.20	0.75	0.44	0.34	0.00	0.56	1.23	0.94	0.04	0.65	0.73	0.10
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	1998	894	67	1863	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.70	0.70	0.70
Uniform Delay (d), s/veh	50.3	47.0	44.2	55.0	0.0	54.5	58.8	46.3	21.0	59.1	40.9	24.7
Incr Delay (d2), s/veh	119.6	2.7	0.9	0.9	0.0	3.2	109.5	1.2	0.0	4.9	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.4	7.7	3.6	0.9	0.0	2.1	6.4	31.1	0.9	0.8	21.9	2.4
LnGrp Delay(d),s/veh	169.8	49.6	45.1	56.0	0.0	57.7	168.3	47.5	21.0	63.9	42.8	24.9
LnGrp LOS	F	D	D	E		E	F	D	C	E	D	C
Approach Vol, veh/h		671			90			2032			1473	
Approach Delay, s/veh		105.3			57.2			54.4			42.1	
Approach LOS		F			E			D			D	

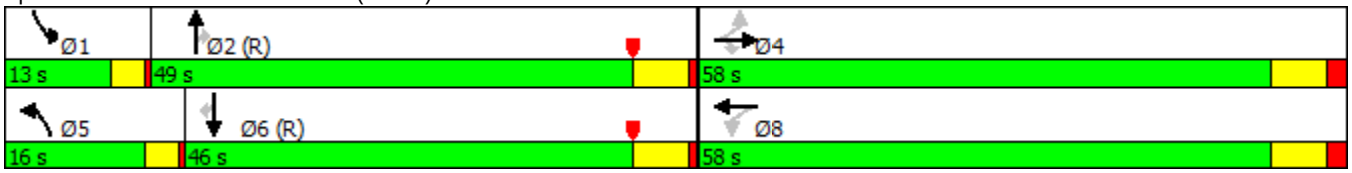
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	76.1	9.6	28.1	11.0	71.4	23.0	14.6
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.8	66.8	4.0	17.0	9.5	47.2	21.5	6.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	58.2
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	350	480	283	29	143	167	1563	78	70	1292	172
Future Volume (vph)	350	480	283	29	143	167	1563	78	70	1292	172
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.5	44.5	44.5	44.5	44.5	15.6	52.3	52.3	8.4	43.4	43.4
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.13	0.44	0.44	0.07	0.36	0.36
v/c Ratio	0.90	0.73	0.42	0.19	0.27	0.81	1.07	0.11	0.63	1.07	0.28
Control Delay	62.0	38.9	8.6	26.0	24.4	58.3	76.1	14.1	87.1	64.2	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	38.9	8.6	26.0	24.4	58.3	76.1	14.1	87.1	64.2	4.7
LOS	E	D	A	C	C	E	E	B	F	E	A
Approach Delay		38.5			24.6		71.8			58.6	
Approach LOS		D			C		E			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 57.4	Intersection LOS: E
Intersection Capacity Utilization 101.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	480	283	29	143	31	167	1563	78	70	1292	172
Future Volume (veh/h)	350	480	283	29	143	31	167	1563	78	70	1292	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	357	490	197	30	146	27	170	1595	60	71	1318	149
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	451	723	606	189	594	110	169	1391	622	87	1220	546
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.03	0.13	0.13	0.11	0.71	0.71
Sat Flow, veh/h	1163	1800	1509	724	1478	273	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	357	490	197	30	0	173	170	1595	60	71	1318	149
Grp Sat Flow(s),veh/h/ln	1163	1800	1509	724	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	35.3	26.9	10.8	4.3	0.0	7.9	12.5	48.8	4.1	5.1	42.8	4.2
Cycle Q Clear(g_c), s	43.2	26.9	10.8	31.1	0.0	7.9	12.5	48.8	4.1	5.1	42.8	4.2
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	451	723	606	189	0	704	169	1391	622	87	1220	546
V/C Ratio(X)	0.79	0.68	0.33	0.16	0.00	0.25	1.01	1.15	0.10	0.81	1.08	0.27
Avail Cap(c_a), veh/h	478	765	641	206	0	744	169	1391	622	128	1220	546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.64	0.64	0.64	0.42	0.42	0.42
Uniform Delay (d), s/veh	38.2	29.5	24.7	42.3	0.0	23.8	57.9	51.9	32.6	52.9	17.2	11.7
Incr Delay (d2), s/veh	8.4	2.2	0.3	0.4	0.0	0.2	57.7	72.0	0.2	6.2	43.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	13.8	4.5	0.9	0.0	3.8	8.3	37.0	1.8	2.4	26.6	1.8
LnGrp Delay(d),s/veh	46.6	31.8	25.0	42.7	0.0	24.0	115.6	123.9	32.8	59.1	60.5	12.2
LnGrp LOS	D	C	C	D		C	F	F	C	E	F	B
Approach Vol, veh/h		1044			203			1825			1538	
Approach Delay, s/veh		35.5			26.8			120.1			55.7	
Approach LOS		D			C			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	54.8		55.2	16.0	48.8		55.2
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	7.1	50.8		45.2	14.5	44.8		33.1
Green Ext Time (p_c), s	0.0	0.0		3.0	0.0	0.0		5.9

Intersection Summary		
HCM 2010 Ctrl Delay		75.4
HCM 2010 LOS		E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	50	29	209	7	13	140	1689	12	11	1575	51
Future Volume (vph)	50	29	209	7	13	140	1689	12	11	1575	51
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.7	15.7	15.7	15.7	15.7	15.6	90.1	90.1	5.5	74.7	74.7
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.75	0.75	0.05	0.62	0.62
v/c Ratio	0.33	0.14	0.64	0.05	0.11	0.73	0.72	0.01	0.16	0.80	0.06
Control Delay	47.6	41.2	19.9	37.0	25.7	58.9	10.5	0.0	70.8	12.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	41.2	19.9	37.0	25.7	58.9	10.5	0.0	70.8	12.3	0.1
LOS	D	D	B	D	C	E	B	A	E	B	A
Approach Delay		26.8			28.4		14.1			12.3	
Approach LOS		C			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	29	209	7	13	10	140	1689	12	11	1575	51
Future Volume (veh/h)	50	29	209	7	13	10	140	1689	12	11	1575	51
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	32	122	8	14	9	152	1836	12	12	1712	55
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	176	180	153	159	102	66	175	2633	1178	22	2309	1010
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.77	0.77	0.03	1.00	1.00
Sat Flow, veh/h	1332	1800	1530	1183	1025	659	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	54	32	122	8	0	23	152	1836	12	12	1712	55
Grp Sat Flow(s),veh/h/ln	1332	1800	1530	1183	0	1684	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.6	2.0	9.4	0.7	0.0	1.5	11.1	32.0	0.2	0.9	0.0	0.0
Cycle Q Clear(g_c), s	6.1	2.0	9.4	2.7	0.0	1.5	11.1	32.0	0.2	0.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	180	153	159	0	168	175	2633	1178	22	2309	1010
V/C Ratio(X)	0.31	0.18	0.80	0.05	0.00	0.14	0.87	0.70	0.01	0.54	0.74	0.05
Avail Cap(c_a), veh/h	510	630	535	455	0	589	175	2633	1178	67	2309	1010
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.24	0.24	0.24
Uniform Delay (d), s/veh	52.1	49.5	52.8	50.7	0.0	49.3	52.6	6.9	3.2	58.0	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.3	7.0	0.1	0.0	0.3	33.3	1.6	0.0	3.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.0	4.3	0.2	0.0	0.7	6.6	15.4	0.1	0.4	0.2	0.0
LnGrp Delay(d),s/veh	52.8	49.8	59.8	50.8	0.0	49.6	85.9	8.4	3.2	61.6	0.5	0.0
LnGrp LOS	D	D	E	D		D	F	A	A	E	A	A
Approach Vol, veh/h		208			31			2000			1779	
Approach Delay, s/veh		56.4			49.9			14.3			0.9	
Approach LOS		E			D			B			A	

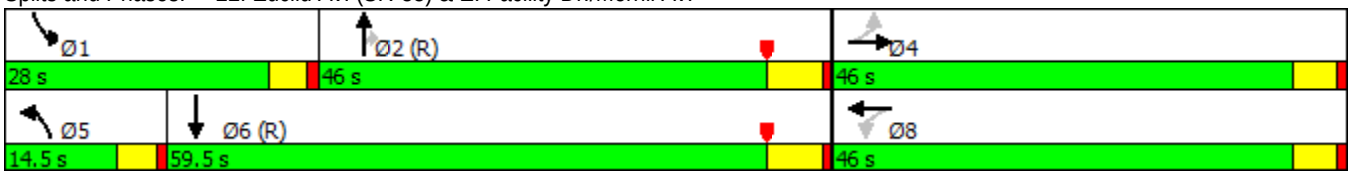
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	98.1		16.8	16.5	86.7		16.8
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.9	34.0		11.4	13.1	2.0		4.7
Green Ext Time (p_c), s	0.0	23.1		0.6	0.0	42.5		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.8
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	21	182	0	2	1423	350	690	1082
Future Volume (vph)	5	21	182	0	2	1423	350	690	1082
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	10.0	40.0	40.0	23.5	65.1
Actuated g/C Ratio		0.34		0.34	0.08	0.33	0.33	0.20	0.54
v/c Ratio		0.07		1.21	0.01	1.34	0.67	2.35	0.63
Control Delay		20.8		139.3	77.0	180.1	12.7	633.2	26.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.8		139.3	77.0	180.1	12.7	633.2	26.0
LOS		C		F	E	F	B	F	C
Approach Delay		20.8		139.3		147.0			262.4
Approach LOS		C		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.35	
Intersection Signal Delay: 193.2	Intersection LOS: F
Intersection Capacity Utilization 144.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	11	182	0	457	2	1423	350	690	1082	1
Future Volume (veh/h)	5	21	11	182	0	457	2	1423	350	690	1082	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	23	4	196	0	463	2	1530	347	742	1163	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	88	380	62	189	2	360	9	1140	499	317	1837	2
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.33	0.33	0.20	0.52	0.52
Sat Flow, veh/h	156	1111	181	440	6	1053	1619	3420	1496	1619	3506	3
Grp Volume(v), veh/h	32	0	0	659	0	0	2	1530	347	742	567	597
Grp Sat Flow(s),veh/h/ln	1448	0	0	1499	0	0	1619	1710	1496	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	39.5	0.0	0.0	0.1	40.0	24.2	23.5	28.4	28.4
Cycle Q Clear(g_c), s	1.5	0.0	0.0	41.0	0.0	0.0	0.1	40.0	24.2	23.5	28.4	28.4
Prop In Lane	0.16		0.12	0.30		0.70	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	529	0	0	551	0	0	9	1140	499	317	896	943
V/C Ratio(X)	0.06	0.00	0.00	1.20	0.00	0.00	0.23	1.34	0.70	2.34	0.63	0.63
Avail Cap(c_a), veh/h	529	0	0	551	0	0	135	1140	499	317	896	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	40.9	0.0	0.0	59.4	40.0	34.7	48.3	20.4	20.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	105.0	0.0	0.0	0.4	154.5	0.7	612.9	3.4	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	34.3	0.0	0.0	0.1	43.3	10.0	64.5	14.2	14.9
LnGrp Delay(d),s/veh	26.5	0.0	0.0	145.8	0.0	0.0	59.9	194.5	35.5	661.1	23.8	23.6
LnGrp LOS	C			F			E	F	D	F	C	C
Approach Vol, veh/h		32			659			1879			1906	
Approach Delay, s/veh		26.5			145.8			165.0			271.8	
Approach LOS		C			F			F			F	

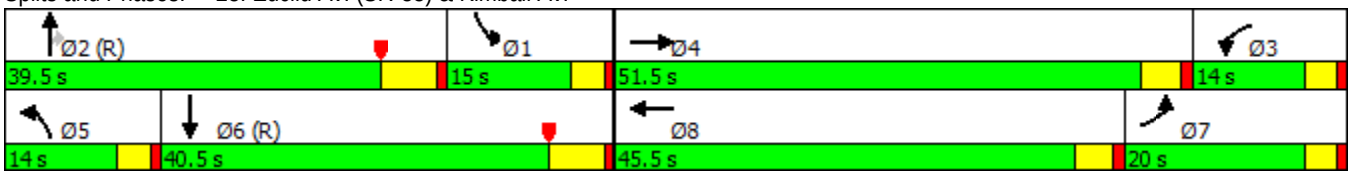
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.0	46.0		46.0	5.1	68.9		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	25.5	42.0		3.5	2.1	30.4		43.0
Green Ext Time (p_c), s	0.0	0.0		3.0	0.0	18.8		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		206.7
HCM 2010 LOS		F

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	629	798	206	339	125	814	154	245	882
Future Volume (vph)	629	798	206	339	125	814	154	245	882
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	31.9	39.6	17.4	25.1	10.0	32.7	32.7	11.8	34.5
Actuated g/C Ratio	0.27	0.33	0.14	0.21	0.08	0.27	0.27	0.10	0.29
v/c Ratio	1.53	0.82	0.92	0.79	0.97	0.91	0.30	1.60	1.16
Control Delay	280.0	42.7	92.7	38.0	97.7	46.1	13.0	324.6	114.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	280.0	42.7	92.7	38.0	97.7	46.1	13.0	324.6	114.8
LOS	F	D	F	D	F	D	B	F	F
Approach Delay		141.7		51.7		47.3			153.5
Approach LOS		F		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.60	
Intersection Signal Delay: 107.7	Intersection LOS: F
Intersection Capacity Utilization 114.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	629	798	82	206	339	278	125	814	154	245	882	201
Future Volume (veh/h)	629	798	82	206	339	278	125	814	154	245	882	201
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	655	831	81	215	353	256	130	848	145	255	919	191
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	281	960	94	135	410	292	135	929	416	274	1053	219
Arrive On Green	0.17	0.30	0.30	0.08	0.21	0.21	0.03	0.09	0.09	0.17	0.37	0.37
Sat Flow, veh/h	1619	3149	307	1619	1909	1361	1619	3420	1530	1619	2814	584
Grp Volume(v), veh/h	655	451	461	215	316	293	130	848	145	255	558	552
Grp Sat Flow(s),veh/h/ln	1619	1710	1746	1619	1710	1560	1619	1710	1530	1619	1710	1688
Q Serve(g_s), s	20.8	29.9	29.9	10.0	21.3	21.8	9.6	29.5	10.7	18.6	36.4	36.5
Cycle Q Clear(g_c), s	20.8	29.9	29.9	10.0	21.3	21.8	9.6	29.5	10.7	18.6	36.4	36.5
Prop In Lane	1.00		0.18	1.00		0.87	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	281	521	532	135	367	335	135	929	416	274	640	632
V/C Ratio(X)	2.33	0.87	0.87	1.59	0.86	0.88	0.96	0.91	0.35	0.93	0.87	0.87
Avail Cap(c_a), veh/h	281	670	684	135	584	533	135	955	427	274	640	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.40	0.40	0.40	1.00	1.00	1.00	0.44	0.44	0.44	0.74	0.74	0.74
Uniform Delay (d), s/veh	49.6	39.4	39.4	55.0	45.4	45.6	58.2	53.2	44.6	49.1	34.9	34.9
Incr Delay (d2), s/veh	603.6	4.1	4.0	299.1	4.3	5.9	41.2	7.5	1.0	29.2	11.8	12.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	56.4	14.8	15.1	15.7	10.5	9.9	5.9	14.9	4.7	10.6	19.3	19.1
LnGrp Delay(d),s/veh	653.2	43.4	43.4	354.1	49.7	51.5	99.3	60.7	45.7	78.4	46.6	46.9
LnGrp LOS	F	D	D	F	D	D	F	E	D	E	D	D
Approach Vol, veh/h		1567			824			1123			1365	
Approach Delay, s/veh		298.3			129.8			63.2			52.7	
Approach LOS		F			F			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.3	38.6	14.0	41.1	14.0	50.9	24.8	30.3
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	20.6	31.5	12.0	31.9	11.6	38.5	22.8	23.8
Green Ext Time (p_c), s	0.0	1.1	0.0	4.7	0.0	0.0	0.0	1.9

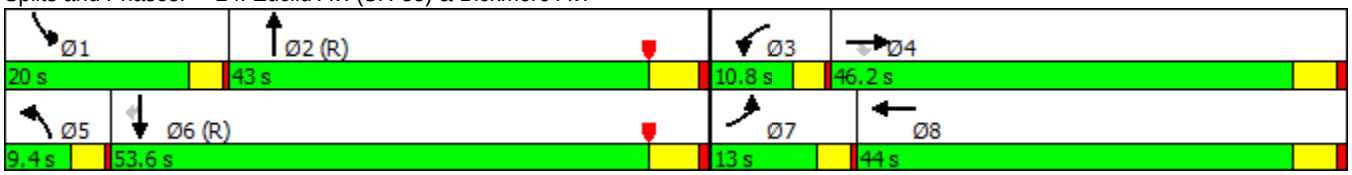
Intersection Summary	
HCM 2010 Ctrl Delay	147.0
HCM 2010 LOS	F

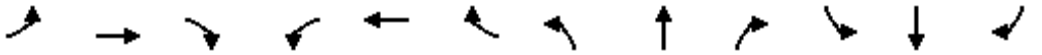
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	116	120	119	90	43	47	866	217	838	78
Future Volume (vph)	116	120	119	90	43	47	866	217	838	78
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.5	17.8	17.8	7.3	15.6	7.4	52.5	24.9	71.7	71.7
Actuated g/C Ratio	0.08	0.15	0.15	0.06	0.13	0.06	0.44	0.21	0.60	0.60
v/c Ratio	1.02	0.50	0.39	1.02	0.57	0.53	0.82	0.72	0.46	0.09
Control Delay	139.0	50.7	9.0	152.2	22.5	81.1	14.4	58.5	5.1	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.0	50.7	9.0	152.2	22.5	81.1	14.4	58.5	5.1	0.8
LOS	F	D	A	F	C	F	B	E	A	A
Approach Delay		65.6			69.3		17.2		15.0	
Approach LOS		E			E		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 26.9	Intersection LOS: C
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	120	119	90	43	116	47	866	205	217	838	78
Future Volume (veh/h)	116	120	119	90	43	116	47	866	205	217	838	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	129	133	113	100	48	117	52	962	218	241	931	87
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	128	262	222	98	59	144	65	1409	319	223	2080	911
Arrive On Green	0.08	0.15	0.15	0.06	0.13	0.13	0.05	0.68	0.68	0.28	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	465	1134	1619	2760	624	1619	3420	1498
Grp Volume(v), veh/h	129	133	113	100	0	165	52	595	585	241	931	87
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1600	1619	1710	1674	1619	1710	1498
Q Serve(g_s), s	9.5	8.2	8.2	7.3	0.0	12.0	3.8	25.0	25.1	16.5	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.2	8.2	7.3	0.0	12.0	3.8	25.0	25.1	16.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.71	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	128	262	222	98	0	203	65	873	855	223	2080	911
V/C Ratio(X)	1.01	0.51	0.51	1.02	0.00	0.81	0.81	0.68	0.68	1.08	0.45	0.10
Avail Cap(c_a), veh/h	128	618	525	98	0	520	80	873	855	223	2080	911
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.3	47.3	47.3	56.3	0.0	51.0	56.4	13.4	13.5	43.5	0.0	0.0
Incr Delay (d2), s/veh	81.2	0.6	0.7	94.9	0.0	3.0	3.6	0.4	0.4	45.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	4.1	3.5	5.9	0.0	5.5	1.8	11.6	11.6	10.1	0.0	0.0
LnGrp Delay(d),s/veh	136.5	47.9	48.0	151.4	0.0	53.9	60.0	13.8	13.9	88.5	0.1	0.0
LnGrp LOS	F	D	D	F		D	E	B	B	F	A	A
Approach Vol, veh/h		375			265			1232			1259	
Approach Delay, s/veh		78.4			90.7			15.8			17.0	
Approach LOS		E			F			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	66.8	10.8	22.4	8.3	78.5	13.0	20.2
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	18.5	27.1	9.3	10.2	5.8	2.0	11.5	14.0
Green Ext Time (p_c), s	0.0	6.1	0.0	1.2	0.0	11.0	0.0	1.2

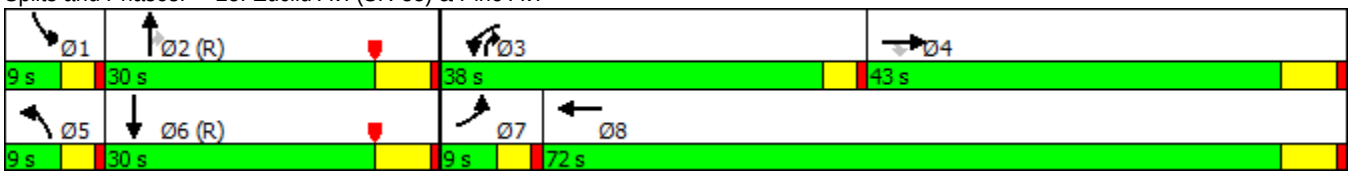
Intersection Summary	
HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	346	29	484	78	34	992	1095	105	890
Future Volume (vph)	15	346	29	484	78	34	992	1095	105	890
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	29.7	29.7	34.0	64.1	6.2	24.0	64.0	12.3	33.9
Actuated g/C Ratio	0.04	0.25	0.25	0.28	0.53	0.05	0.20	0.53	0.10	0.28
v/c Ratio	0.22	0.80	0.06	0.60	0.15	0.42	1.50	1.23	0.65	0.97
Control Delay	63.7	55.8	0.2	40.6	9.0	67.2	257.5	126.6	57.0	59.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	55.8	0.2	40.6	9.0	67.2	257.5	126.6	57.0	59.0
LOS	E	E	A	D	A	E	F	F	E	E
Approach Delay		52.0			33.7		186.9			58.8
Approach LOS		D			C		F			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.50
Intersection Signal Delay: 120.0 — Intersection LOS: F
Intersection Capacity Utilization 109.0% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	346	29	484	78	59	34	992	1095	105	890	15
Future Volume (veh/h)	15	346	29	484	78	59	34	992	1095	105	890	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	357	0	499	80	55	35	1023	696	108	918	11
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	416	354	556	401	276	46	1274	858	67	1334	16
Arrive On Green	0.02	0.23	0.00	0.19	0.40	0.40	0.03	0.37	0.37	0.01	0.13	0.13
Sat Flow, veh/h	1619	1800	1530	2956	995	684	1619	3420	1530	1619	3460	41
Grp Volume(v), veh/h	15	357	0	499	0	135	35	1023	696	108	454	475
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1679	1619	1710	1530	1619	1710	1792
Q Serve(g_s), s	1.1	22.8	0.0	19.8	0.0	6.3	2.6	32.1	44.0	5.0	30.5	30.5
Cycle Q Clear(g_c), s	1.1	22.8	0.0	19.8	0.0	6.3	2.6	32.1	44.0	5.0	30.5	30.5
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	27	416	354	556	0	676	46	1274	858	67	659	690
V/C Ratio(X)	0.57	0.86	0.00	0.90	0.00	0.20	0.75	0.80	0.81	1.60	0.69	0.69
Avail Cap(c_a), veh/h	67	555	472	838	0	924	67	1274	858	67	659	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.86	0.86	0.86
Uniform Delay (d), s/veh	58.6	44.2	0.0	47.6	0.0	23.3	57.9	33.7	21.3	59.2	45.5	45.5
Incr Delay (d2), s/veh	6.8	11.3	0.0	6.4	0.0	0.2	1.2	0.5	0.8	321.8	5.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.6	0.0	8.6	0.0	2.9	1.2	15.3	18.7	8.3	15.4	16.1
LnGrp Delay(d),s/veh	65.4	55.5	0.0	54.0	0.0	23.5	59.1	34.2	22.1	381.0	50.5	50.3
LnGrp LOS	E	E		D		C	E	C	C	F	D	D
Approach Vol, veh/h		372			634			1754			1037	
Approach Delay, s/veh		55.9			47.5			29.9			84.8	
Approach LOS		E			D			C			F	

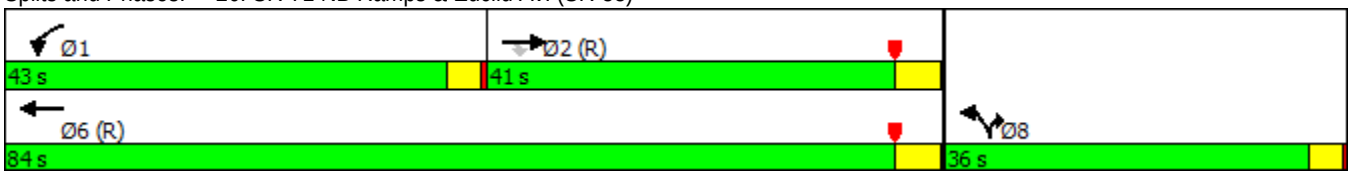
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	50.7	26.6	33.7	7.4	52.2	6.0	54.3
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	46.0	21.8	24.8	4.6	32.5	3.1	8.3
Green Ext Time (p_c), s	0.0	0.0	0.8	2.9	0.0	0.0	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	50.4
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	842	181	316	1137	155	1372
Future Volume (vph)	842	181	316	1137	155	1372
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	41.0	41.0	43.0	84.0	36.0	36.0
Total Split (%)	34.2%	34.2%	35.8%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	46.8	46.8	29.2	79.5	32.5	32.5
Actuated g/C Ratio	0.39	0.39	0.24	0.66	0.27	0.27
v/c Ratio	0.70	0.28	0.84	0.56	0.19	1.83
Control Delay	37.4	10.2	61.9	3.3	34.4	396.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	10.2	61.9	3.3	34.4	396.9
LOS	D	B	E	A	C	F
Approach Delay	32.6			16.1	360.1	
Approach LOS	C			B	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.83	
Intersection Signal Delay: 151.5	Intersection LOS: F
Intersection Capacity Utilization 121.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	842	181	316	1137	155	1372
Future Volume (veh/h)	842	181	316	1137	155	1372
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	936	0	351	1263	172	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2092	936	378	2947	238	110
Arrive On Green	1.00	0.00	0.22	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	936	0	351	1263	172	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	24.1	9.7	6.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	24.1	9.7	6.1	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2092	936	378	2947	238	110
V/C Ratio(X)	0.45	0.00	0.93	0.43	0.72	0.00
Avail Cap(c_a), veh/h	2092	936	564	2947	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.46	0.46	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	45.8	1.8	54.5	0.0
Incr Delay (d2), s/veh	0.7	0.0	7.0	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	12.1	4.5	2.9	0.0
LnGrp Delay(d),s/veh	0.7	0.0	52.8	2.0	58.6	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	936			1614	172	
Approach Delay, s/veh	0.7			13.1	58.6	
Approach LOS	A			B	E	

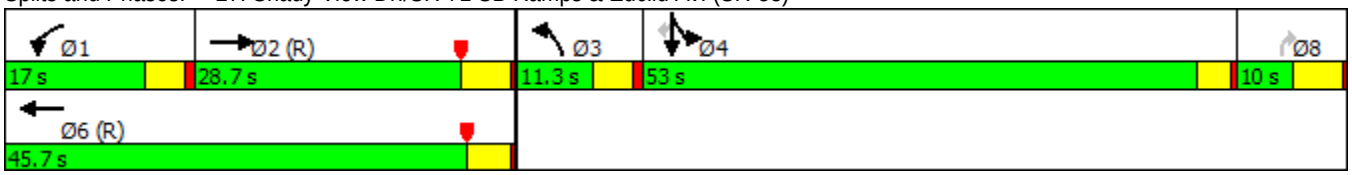
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	30.0	77.9				107.9		12.1
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	39.5	36.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	26.1	2.0				11.7		8.1
Green Ext Time (p_c), s	0.4	17.0				21.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	322	103	239	31	16	756	146	159
Future Volume (vph)	322	103	239	31	16	756	146	159
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.7	17.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.9%	14.2%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	35.9	11.6	52.5	6.5	5.0	42.7	42.7	42.7
Actuated g/C Ratio	0.30	0.10	0.44	0.05	0.04	0.36	0.36	0.36
v/c Ratio	0.37	0.68	0.16	0.37	0.08	0.84	0.80	0.25
Control Delay	37.0	68.4	11.8	66.7	0.9	49.8	45.1	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	68.4	11.8	66.7	0.9	49.8	45.1	4.3
LOS	D	E	B	E	A	D	D	A
Approach Delay	37.0		28.8				41.0	
Approach LOS	D		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 38.0	Intersection LOS: D
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	322	45	103	239	0	31	0	16	756	146	159
Future Volume (veh/h)	0	322	45	103	239	0	31	0	16	756	146	159
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	332	46	106	246	0	32	0	16	887	0	164
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1526	210	127	2123	0	0	0	0	998	0	472
Arrive On Green	0.00	0.51	0.51	0.16	1.00	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3112	415	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	187	191	106	246	0		0.0		887	0	164
Grp Sat Flow(s),veh/h/ln	0	1710	1727	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	7.3	7.4	7.6	0.0	0.0				31.3	0.0	10.0
Cycle Q Clear(g_c), s	0.0	7.3	7.4	7.6	0.0	0.0				31.3	0.0	10.0
Prop In Lane	0.00		0.24	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	864	872	127	2123	0				998	0	472
V/C Ratio(X)	0.00	0.22	0.22	0.84	0.12	0.00				0.89	0.00	0.35
Avail Cap(c_a), veh/h	0	864	872	169	2123	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.5	16.5	49.9	0.0	0.0				39.5	0.0	32.2
Incr Delay (d2), s/veh	0.0	0.6	0.6	23.1	0.1	0.0				6.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	3.6	4.2	0.0	0.0				14.9	0.0	4.2
LnGrp Delay(d),s/veh	0.0	17.1	17.1	72.9	0.1	0.0				45.6	0.0	32.6
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		378			352						1051	
Approach Delay, s/veh		17.1			22.0						43.6	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.9	65.6		40.5		79.5		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	12.5	23.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.6	9.4		33.3		2.0		
Green Ext Time (p_c), s	0.1	2.1		3.7		2.5		

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1203	0	0	882	0	0	0	0	0	0	0
Future Vol, veh/h	0	1203	0	0	882	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1266	0	0	928	0	0	0	0	0	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	928	0	-	-	-	0				2194	2194	928
Stage 1	-	-	-	-	-	-				928	928	-
Stage 2	-	-	-	-	-	-				1266	1266	-
Critical Hdwy	4.1	-	-	-	-	-				6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	745	-	0	0	-	-				50	46	328
Stage 1	-	-	0	0	-	-				388	349	-
Stage 2	-	-	0	0	-	-				268	242	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	745	-	-	-	-	-				50	0	328
Mov Cap-2 Maneuver	-	-	-	-	-	-				167	0	-
Stage 1	-	-	-	-	-	-				388	0	-
Stage 2	-	-	-	-	-	-				268	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	745	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1128	86	27	830	37	20
Future Vol, veh/h	1128	86	27	830	37	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1213	92	29	892	40	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1305	0	2210	653
Stage 1	-	-	-	-	1259	-
Stage 2	-	-	-	-	951	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	537	-	44	415
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	379	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	537	-	42	415
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	359	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	23.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	189	415	-	-	537	-
HCM Lane V/C Ratio	0.211	0.052	-	-	0.054	-
HCM Control Delay (s)	29.1	14.1	-	-	12.1	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.8	0.2	-	-	0.2	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1017	39	776	81	22
Future Volume (vph)	1017	39	776	81	22
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.3	5.2	27.5	10.5	10.5
Actuated g/C Ratio	0.49	0.10	0.55	0.21	0.21
v/c Ratio	0.73	0.24	0.82	0.25	0.07
Control Delay	13.4	28.3	16.2	22.4	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	28.3	16.2	22.4	11.0
LOS	B	C	B	C	B
Approach Delay	13.4		16.8	19.9	
Approach LOS	B		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 49.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1017	131	39	776	81	22
Future Volume (veh/h)	1017	131	39	776	81	22
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1071	138	41	817	85	21
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1449	186	69	1088	302	285
Arrive On Green	0.48	0.48	0.04	0.60	0.19	0.19
Sat Flow, veh/h	3127	391	1619	1800	1619	1530
Grp Volume(v), veh/h	602	607	41	817	85	21
Grp Sat Flow(s),veh/h/ln	1710	1718	1619	1800	1619	1530
Q Serve(g_s), s	15.4	15.5	1.3	17.8	2.4	0.6
Cycle Q Clear(g_c), s	15.4	15.5	1.3	17.8	2.4	0.6
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	816	820	69	1088	302	285
V/C Ratio(X)	0.74	0.74	0.60	0.75	0.28	0.07
Avail Cap(c_a), veh/h	913	917	153	1283	302	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.4	11.4	25.5	7.7	18.9	18.2
Incr Delay (d2), s/veh	2.8	2.9	3.0	2.1	2.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	7.9	0.7	9.3	1.3	0.3
LnGrp Delay(d),s/veh	14.3	14.3	28.5	9.8	21.2	18.7
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1209			858	106	
Approach Delay, s/veh	14.3			10.7	20.7	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.9	32.0				38.9		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	3.3	17.5				19.8		4.4
Green Ext Time (p_c), s	0.0	8.4				12.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	954	47	737	77	31
Future Volume (vph)	954	47	737	77	31
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	23.9	5.7	29.3	10.5	10.5
Actuated g/C Ratio	0.47	0.11	0.57	0.21	0.21
v/c Ratio	0.74	0.28	0.77	0.25	0.10
Control Delay	15.0	29.1	13.3	23.4	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	29.1	13.3	23.4	15.9
LOS	B	C	B	C	B
Approach Delay	15.0		14.2	21.3	
Approach LOS	B		B	C	

Intersection Summary		
Cycle Length: 60		
Actuated Cycle Length: 51.1		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.77		
Intersection Signal Delay: 15.0	Intersection LOS: B	
Intersection Capacity Utilization 58.3%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	954	122	47	737	77	31
Future Volume (veh/h)	954	122	47	737	77	31
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1026	131	51	792	83	27
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1432	183	81	1093	306	289
Arrive On Green	0.47	0.47	0.05	0.61	0.19	0.19
Sat Flow, veh/h	3132	388	1619	1800	1619	1530
Grp Volume(v), veh/h	576	581	51	792	83	27
Grp Sat Flow(s),veh/h/ln	1710	1721	1619	1800	1619	1530
Q Serve(g_s), s	14.3	14.3	1.6	16.3	2.3	0.8
Cycle Q Clear(g_c), s	14.3	14.3	1.6	16.3	2.3	0.8
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	805	810	81	1093	306	289
V/C Ratio(X)	0.72	0.72	0.63	0.72	0.27	0.09
Avail Cap(c_a), veh/h	927	932	180	1332	306	289
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	24.7	7.3	18.4	17.7
Incr Delay (d2), s/veh	2.3	2.3	3.0	1.6	2.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	7.1	0.8	8.4	1.2	0.4
LnGrp Delay(d),s/veh	13.5	13.5	27.7	8.9	20.6	18.4
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1157			843	110	
Approach Delay, s/veh	13.5			10.0	20.0	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.2	31.1				38.4		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.6	16.3				18.3		4.3
Green Ext Time (p_c), s	0.0	8.6				12.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	47

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	267	672	46	14	413	89	25	6	10	75	18	347
Future Vol, veh/h	267	672	46	14	413	89	25	6	10	75	18	347
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	284	715	49	15	439	95	27	6	11	80	19	369

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	534	0	0	768	0	0	2022	1875	386	1445	1852	487
Stage 1	-	-	-	-	-	-	1311	1311	-	516	516	-
Stage 2	-	-	-	-	-	-	711	564	-	929	1336	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1044	-	-	855	-	-	39	73	618	102	75	585
Stage 1	-	-	-	-	-	-	171	231	-	546	538	-
Stage 2	-	-	-	-	-	-	427	512	-	292	224	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1044	-	-	855	-	-	~ 10	52	616	~ 75	53	585
Mov Cap-2 Maneuver	-	-	-	-	-	-	496	110	-	144	120	-
Stage 1	-	-	-	-	-	-	124	168	-	397	529	-
Stage 2	-	-	-	-	-	-	149	503	-	201	162	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.3	17.2	203.8
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	338	1044	-	-	855	-	-	348
HCM Lane V/C Ratio	0.129	0.272	-	-	0.017	-	-	1.345
HCM Control Delay (s)	17.2	9.7	-	-	9.3	-	-	203.8
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.4	1.1	-	-	0.1	-	-	22.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	689	38	19	421	2	23	0	12	11	0	71
Future Vol, veh/h	30	689	38	19	421	2	23	0	12	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	783	43	22	478	2	26	0	14	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	481	0	0	826	0	0	1431	1394	413	980	1414	479
Stage 1	-	-	-	-	-	-	870	870	-	523	523	-
Stage 2	-	-	-	-	-	-	561	524	-	457	891	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1092	-	-	813	-	-	105	143	594	219	139	591
Stage 1	-	-	-	-	-	-	317	372	-	541	534	-
Stage 2	-	-	-	-	-	-	516	533	-	558	363	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1092	-	-	813	-	-	87	135	594	205	131	591
Mov Cap-2 Maneuver	-	-	-	-	-	-	245	299	-	205	131	-
Stage 1	-	-	-	-	-	-	307	361	-	525	520	-
Stage 2	-	-	-	-	-	-	436	519	-	529	352	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	18.5	14.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	307	1092	-	-	813	-	-	472
HCM Lane V/C Ratio	0.13	0.03	-	-	0.027	-	-	0.189
HCM Control Delay (s)	18.5	8.4	-	-	9.5	-	-	14.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	0.7

Intersection	
Intersection Delay, s/veh	24.7
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	345	0	367	0	0	0	0	0	192	156	0
Future Vol, veh/h	0	345	0	367	0	0	0	0	0	192	156	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	371	0	395	0	0	0	0	0	206	168	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	29.7	16.9
HCM LOS	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	192	156	345	367	328	202
LT Vol	192	0	345	0	0	0
Through Vol	0	156	0	0	328	0
RT Vol	0	0	0	367	0	202
Lane Flow Rate	206	168	371	395	353	217
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.477	0.364	0.803	0.72	0.738	0.411
Departure Headway (Hd)	8.321	7.805	7.792	6.568	7.538	6.818
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	434	461	467	552	480	528
Service Time	6.06	5.544	5.492	4.268	5.274	4.554
HCM Lane V/C Ratio	0.475	0.364	0.794	0.716	0.735	0.411
HCM Control Delay	18.5	15	35.3	24.4	28.7	14.3
HCM Lane LOS	C	B	E	C	D	B
HCM 95th-tile Q	2.5	1.6	7.4	5.9	6.1	2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	328	202
Future Vol, veh/h	0	0	328	202
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	353	217
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	23.2
HCM LOS	C

APPENDIX 7.2:

OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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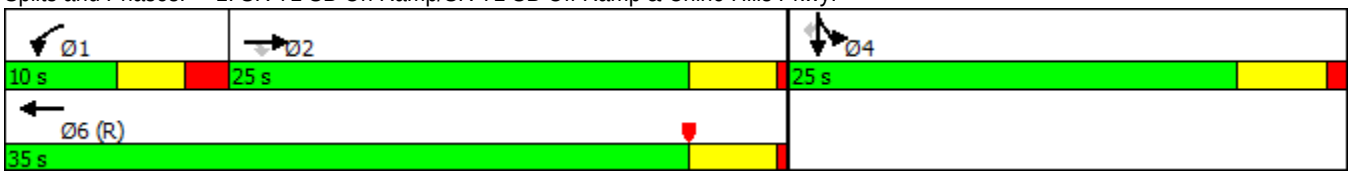
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1248	323	6	983	549	86	407
Future Volume (vph)	1248	323	6	983	549	86	407
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.44	0.37	0.04	0.58	0.63	0.60	0.71
Control Delay	11.7	3.2	28.7	9.6	23.5	22.3	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	3.2	28.7	9.6	23.5	22.3	20.8
LOS	B	A	C	A	C	C	C
Approach Delay	10.0			9.7		22.1	
Approach LOS	A			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1248	323	6	983	0	0	0	0	549	86	407
Future Volume (veh/h)	0	1248	323	6	983	0	0	0	0	549	86	407
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1287	263	6	1013	0				630	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1287	263	6	1013	0				630	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	9.2	7.3	0.2	9.5	0.0				9.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.2	7.3	0.2	9.5	0.0				9.7	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.50	0.41	0.47	0.58	0.00				0.58	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.73	0.73	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.9	12.3	29.6	6.3	0.0				16.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.4	7.0	1.0	0.0				2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	3.1	0.1	4.6	0.0				4.6	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.0	12.7	36.5	7.4	0.0				18.9	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1550			1019						630	
Approach Delay, s/veh		13.0			7.5						18.9	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	11.2		11.7		11.5		
Green Ext Time (p_c), s	0.0	8.1		1.2		15.0		

Intersection Summary	
HCM 2010 Ctrl Delay	12.4
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	570	1227	606	351	383	204
Future Volume (vph)	570	1227	606	351	383	204
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	47.0	31.0	31.0	13.0	13.0
Total Split (%)	26.7%	78.3%	51.7%	51.7%	21.7%	21.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	40.5	24.5	24.5	7.0	7.0
Actuated g/C Ratio	0.18	0.68	0.41	0.41	0.12	0.12
v/c Ratio	1.11	0.56	0.46	0.53	1.20	1.13
Control Delay	100.1	6.1	14.2	11.1	164.6	114.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.1	6.1	14.2	11.1	164.6	114.4
LOS	F	A	B	B	F	F
Approach Delay		35.9	13.1			130.9
Approach LOS		D	B			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 46.3	Intersection LOS: D
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	570	1227	0	0	606	351	383	204	9	0	0	0
Future Volume (veh/h)	570	1227	0	0	606	351	383	204	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	600	1292	0	0	638	368	419	192	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	542	2308	0	0	1396	615	378	203	6			
Arrive On Green	0.18	0.68	0.00	0.00	0.41	0.41	0.12	0.12	0.12			
Sat Flow, veh/h	2956	3510	0	0	3510	1506	3238	1736	54			
Grp Volume(v), veh/h	600	1292	0	0	638	368	419	0	198			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1506	1619	0	1790			
Q Serve(g_s), s	11.0	11.8	0.0	0.0	8.1	11.5	7.0	0.0	6.6			
Cycle Q Clear(g_c), s	11.0	11.8	0.0	0.0	8.1	11.5	7.0	0.0	6.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	542	2309	0	0	1397	615	378	0	209			
V/C Ratio(X)	1.11	0.56	0.00	0.00	0.46	0.60	1.11	0.00	0.95			
Avail Cap(c_a), veh/h	542	2309	0	0	1397	615	378	0	209			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.88	0.88	0.00	0.00	0.64	0.64	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.5	5.1	0.0	0.0	12.9	13.9	26.5	0.0	26.3			
Incr Delay (d2), s/veh	69.1	0.9	0.0	0.0	0.7	2.8	79.1	0.0	50.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	9.6	5.7	0.0	0.0	3.9	5.2	7.2	0.0	6.1			
LnGrp Delay(d),s/veh	93.6	6.0	0.0	0.0	13.6	16.7	105.6	0.0	76.3			
LnGrp LOS	F	A			B	B	F		E			
Approach Vol, veh/h		1892			1006			617				
Approach Delay, s/veh		33.8			14.7			96.2				
Approach LOS		C			B			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.0			16.0	31.0		13.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		40.5			11.0	24.5		7.0
Max Q Clear Time (g_c+I1), s		13.8			13.0	13.5		9.0
Green Ext Time (p_c), s		17.5			0.0	8.9		0.0

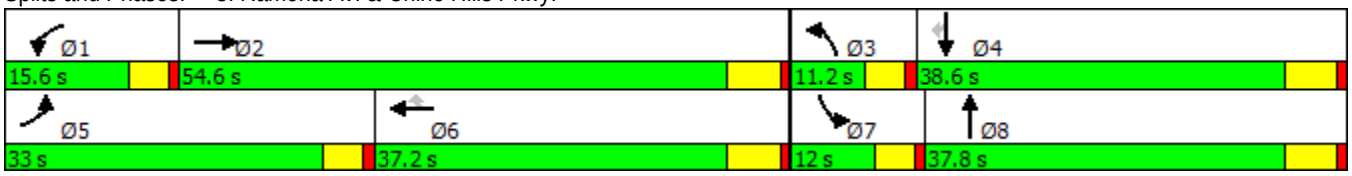
Intersection Summary	
HCM 2010 Ctrl Delay	39.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	361	872	68	674	100	28	407	91	184	255
Future Volume (vph)	361	872	68	674	100	28	407	91	184	255
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	28.4	50.9	8.9	29.4	29.4	6.0	32.0	7.4	37.4	37.4
Actuated g/C Ratio	0.24	0.43	0.08	0.25	0.25	0.05	0.27	0.06	0.32	0.32
v/c Ratio	0.98	0.44	0.59	0.83	0.22	0.35	0.64	0.95	0.18	0.41
Control Delay	86.0	25.0	72.4	51.6	2.7	66.8	39.1	133.7	31.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.0	25.0	72.4	51.6	2.7	66.8	39.1	133.7	31.7	6.0
LOS	F	C	E	D	A	E	D	F	C	A
Approach Delay		42.8		47.5			40.4		36.9	
Approach LOS		D		D			D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 42.6	Intersection LOS: D
Intersection Capacity Utilization 92.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	361	872	4	68	674	100	28	407	153	91	184	255
Future Volume (veh/h)	361	872	4	68	674	100	28	407	153	91	184	255
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	380	918	3	72	709	88	29	428	93	96	194	172
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	393	2176	7	90	832	366	42	763	164	102	1062	467
Arrive On Green	0.24	0.43	0.43	0.06	0.24	0.24	0.03	0.27	0.27	0.06	0.31	0.31
Sat Flow, veh/h	1619	5056	17	1619	3420	1507	1619	2792	601	1619	3420	1504
Grp Volume(v), veh/h	380	595	326	72	709	88	29	261	260	96	194	172
Grp Sat Flow(s),veh/h/ln	1619	1638	1797	1619	1710	1507	1619	1710	1683	1619	1710	1504
Q Serve(g_s), s	27.2	14.8	14.8	5.1	23.2	5.5	2.1	15.3	15.6	6.9	4.9	10.4
Cycle Q Clear(g_c), s	27.2	14.8	14.8	5.1	23.2	5.5	2.1	15.3	15.6	6.9	4.9	10.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	393	1410	773	90	832	366	42	467	460	102	1062	467
V/C Ratio(X)	0.97	0.42	0.42	0.80	0.85	0.24	0.69	0.56	0.57	0.94	0.18	0.37
Avail Cap(c_a), veh/h	393	1410	773	152	917	404	91	467	460	102	1062	467
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	23.2	23.2	54.7	42.3	35.6	56.5	36.5	36.6	54.6	29.5	31.4
Incr Delay (d2), s/veh	36.6	0.3	0.5	6.2	7.7	0.5	7.1	4.7	5.0	68.3	0.4	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.1	6.7	7.5	2.5	11.8	2.3	1.0	7.9	7.9	5.0	2.3	4.6
LnGrp Delay(d),s/veh	80.5	23.5	23.7	60.8	50.0	36.1	63.7	41.2	41.5	122.9	29.9	33.7
LnGrp LOS	F	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1301			869			550			462	
Approach Delay, s/veh		40.2			49.5			42.5			50.6	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	56.2	7.7	42.1	33.0	34.3	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	7.1	16.8	4.1	12.4	29.2	25.2	8.9	17.6
Green Ext Time (p_c), s	0.0	18.4	0.0	4.5	0.0	3.3	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.6
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	894	99	28	719	111	32
Future Vol, veh/h	894	99	28	719	111	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	982	109	31	790	122	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	982	0	1439	491
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	457	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	711	-	126	529
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	610	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	711	-	~ 121	529
Mov Cap-2 Maneuver	-	-	-	-	287	-
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	583	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	26.6
HCM LOS			D

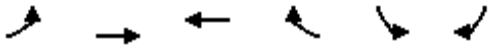
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	320	-	-	711	-
HCM Lane V/C Ratio	0.491	-	-	0.043	-
HCM Control Delay (s)	26.6	-	-	10.3	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.6	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	225	702	647	67	100
Future Volume (vph)	225	702	647	67	100
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	90.0	48.0	30.0	42.0
Total Split (%)	35.0%	75.0%	40.0%	25.0%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	17.9	48.9	26.3	24.7	43.8
Actuated g/C Ratio	0.21	0.57	0.31	0.29	0.51
v/c Ratio	0.73	0.39	0.70	0.09	0.13
Control Delay	45.4	10.2	30.3	27.0	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	10.2	30.3	27.0	4.5
LOS	D	B	C	C	A
Approach Delay		18.7	30.3	13.6	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 85.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 22.7	Intersection LOS: C
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	225	702	647	31	67	100
Future Volume (veh/h)	225	702	647	31	67	100
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	245	763	703	34	73	34
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	281	2001	1190	58	829	695
Arrive On Green	0.17	0.59	0.36	0.36	0.28	0.28
Sat Flow, veh/h	1619	3510	3411	161	2956	1530
Grp Volume(v), veh/h	245	763	362	375	73	34
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1772	1478	1530
Q Serve(g_s), s	12.7	10.3	14.9	14.9	1.6	1.1
Cycle Q Clear(g_c), s	12.7	10.3	14.9	14.9	1.6	1.1
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	281	2001	613	635	829	695
V/C Ratio(X)	0.87	0.38	0.59	0.59	0.09	0.05
Avail Cap(c_a), veh/h	702	3337	836	866	829	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	9.6	22.5	22.5	22.9	13.2
Incr Delay (d2), s/veh	3.3	0.2	1.3	1.3	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	4.8	7.2	7.5	0.7	1.3
LnGrp Delay(d),s/veh	38.0	9.7	23.8	23.8	23.1	13.3
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		1008	737		107	
Approach Delay, s/veh		16.6	23.8		20.0	
Approach LOS		B	C		B	

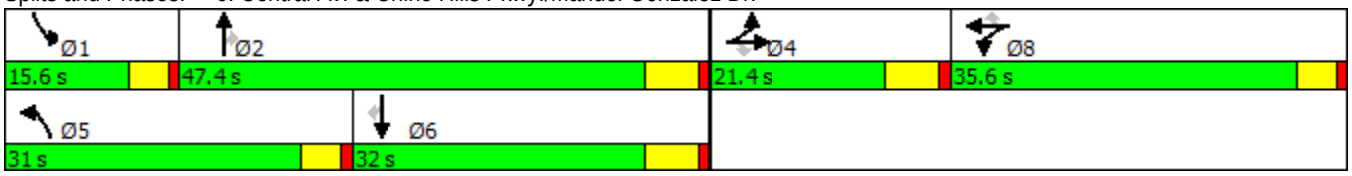
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		56.3		30.0	19.6	36.7		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		84.2		24.2	37.4	42.2		
Max Q Clear Time (g_c+I1), s		12.3		3.6	14.7	16.9		
Green Ext Time (p_c), s		21.1		0.3	0.3	14.0		

Intersection Summary	
HCM 2010 Ctrl Delay	19.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	313	53	301	2	3	7	384	846	46	66	702	259
Future Volume (vph)	313	53	301	2	3	7	384	846	46	66	702	259
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	15.9	13.5	13.5	13.5	26.9	47.6	47.6	8.2	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.76	0.72	0.62	0.01	0.01	0.02	0.91	0.53	0.06	0.52	0.79	0.50
Control Delay	60.3	55.9	10.7	35.5	35.3	0.1	59.9	21.3	0.2	57.7	40.2	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	55.9	10.7	35.5	35.3	0.1	59.9	21.3	0.2	57.7	40.2	15.1
LOS	E	E	B	D	D	A	E	C	A	E	D	B
Approach Delay		36.7			13.7			32.2			35.0	
Approach LOS		D			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 34.1	Intersection LOS: C
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	53	301	2	3	7	384	846	46	66	702	259
Future Volume (veh/h)	313	53	301	2	3	7	384	846	46	66	702	259
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	381	0	231	2	3	3	417	920	38	72	763	227
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	556	0	263	33	36	31	447	1768	775	90	1014	448
Arrive On Green	0.17	0.00	0.17	0.02	0.02	0.02	0.28	0.52	0.52	0.06	0.30	0.30
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1510
Grp Volume(v), veh/h	381	0	231	2	3	3	417	920	38	72	763	227
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1510
Q Serve(g_s), s	9.8	0.0	13.0	0.1	0.1	0.2	22.2	15.7	1.1	3.9	17.8	11.0
Cycle Q Clear(g_c), s	9.8	0.0	13.0	0.1	0.1	0.2	22.2	15.7	1.1	3.9	17.8	11.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	556	0	263	33	36	31	447	1768	775	90	1014	448
V/C Ratio(X)	0.68	0.00	0.88	0.06	0.08	0.10	0.93	0.52	0.05	0.80	0.75	0.51
Avail Cap(c_a), veh/h	572	0	270	568	632	537	484	1768	775	202	1014	448
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	0.0	35.7	42.4	42.5	42.5	31.2	14.1	10.6	41.2	28.1	25.7
Incr Delay (d2), s/veh	3.3	0.0	26.0	0.8	1.0	1.4	23.6	1.1	0.1	6.1	5.1	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	7.4	0.1	0.1	0.1	12.8	7.7	0.5	1.9	9.1	5.1
LnGrp Delay(d),s/veh	37.6	0.0	61.6	43.2	43.4	43.8	54.8	15.2	10.7	47.3	33.3	29.8
LnGrp LOS	D		E	D	D	D	D	B	B	D	C	C
Approach Vol, veh/h		612			8			1375			1062	
Approach Delay, s/veh		46.7			43.5			27.1			33.5	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.5	51.5		21.0	29.0	32.0		6.4
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.9	17.7		15.0	24.2	19.8		2.2
Green Ext Time (p_c), s	0.0	17.1		0.2	0.2	5.5		0.0

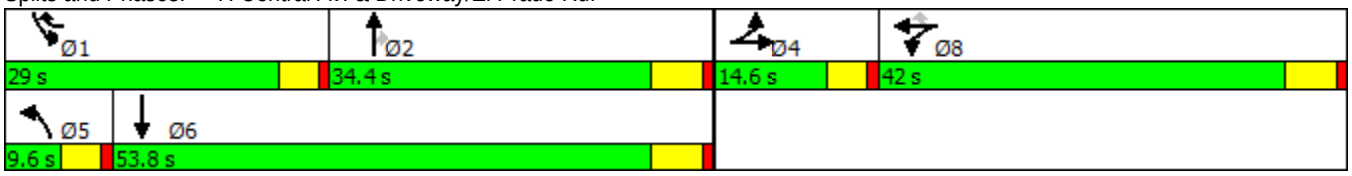
Intersection Summary	
HCM 2010 Ctrl Delay	33.3
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1058	3	519	2	783	749	447	639
Future Volume (vph)	1	1	1058	3	519	2	783	749	447	639
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	1.15	1.08	0.55	0.03	0.96	0.86	1.37	0.28
Control Delay	48.0	41.0	120.9	98.6	8.4	53.0	61.9	14.8	215.4	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	120.9	98.6	8.4	53.0	61.9	14.8	215.4	16.4
LOS	D	D	F	F	A	D	E	B	F	B
Approach Delay		43.3		76.4			38.9			97.6
Approach LOS		D		E			D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 68.2	Intersection LOS: E
Intersection Capacity Utilization 103.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1058	3	519	2	783	749	447	639	10
Future Volume (veh/h)	1	1	1	1058	3	519	2	783	749	447	639	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1178	0	434	2	870	663	497	710	9
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1057	0	836	4	882	390	356	2377	30
Arrive On Green	0.01	0.01	0.01	0.33	0.00	0.33	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5001	63
Grp Volume(v), veh/h	1	0	2	1178	0	434	2	870	663	497	465	254
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	36.2	0.0	19.9	0.1	28.1	28.6	24.4	9.6	9.6
Cycle Q Clear(g_c), s	0.1	0.0	0.1	36.2	0.0	19.9	0.1	28.1	28.6	24.4	9.6	9.6
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	13	0	13	1057	0	836	4	882	390	356	1557	850
V/C Ratio(X)	0.08	0.00	0.15	1.11	0.00	0.52	0.46	0.99	1.70	1.39	0.30	0.30
Avail Cap(c_a), veh/h	146	0	149	1057	0	836	73	882	390	356	1557	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	37.3	0.0	15.9	55.2	40.9	41.1	43.2	17.8	17.8
Incr Delay (d2), s/veh	0.9	0.0	2.0	64.7	0.0	0.6	25.4	27.2	326.7	194.1	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	25.5	0.0	8.5	0.1	16.5	47.1	30.0	4.4	4.9
LnGrp Delay(d),s/veh	55.5	0.0	56.6	102.0	0.0	16.5	80.6	68.1	367.8	237.3	18.3	18.7
LnGrp LOS	E		E	F		B	F	E	F	F	B	B
Approach Vol, veh/h		3			1612			1535			1216	
Approach Delay, s/veh		56.2			79.0			197.6			107.9	
Approach LOS		E			E			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		42.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	11.6		38.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	25.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	128.7
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1247	895	103
Future Volume (vph)	1247	895	103
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	54.0	54.0	36.0
Total Split (%)	60.0%	60.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	58.2	58.2	22.3
Actuated g/C Ratio	0.65	0.65	0.25
v/c Ratio	0.88dr	0.34	1.21dr
Control Delay	9.2	8.1	38.9
Queue Delay	0.0	0.0	0.0
Total Delay	9.2	8.1	38.9
LOS	A	A	D
Approach Delay	9.2	8.1	38.9
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 69.5%	ICU Level of Service C
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1247	810	0	895	103	386
Future Volume (veh/h)	1247	810	0	895	103	386
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1502	976	0	1078	124	272
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2272	1061	0	3408	325	307
Arrive On Green	1.00	1.00	0.00	0.69	0.20	0.20
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1502	976	0	1078	124	272
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	7.8	6.0	15.5
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.8	6.0	15.5
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2272	1061	0	3408	325	307
V/C Ratio(X)	0.66	0.92	0.00	0.32	0.38	0.88
Avail Cap(c_a), veh/h	2272	1061	0	3408	558	527
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.4	31.1	34.9
Incr Delay (d2), s/veh	1.5	14.0	0.0	0.2	0.3	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.1	0.0	3.6	2.7	7.0
LnGrp Delay(d),s/veh	1.5	14.0	0.0	5.7	31.4	39.5
LnGrp LOS	A	B		A	C	D
Approach Vol, veh/h	2478			1078	396	
Approach Delay, s/veh	6.4			5.7	37.0	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		66.9				66.9		23.1
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		49.5				49.5		31.0
Max Q Clear Time (g_c+I1), s		2.0				9.8		17.5
Green Ext Time (p_c), s		32.4				28.7		0.5

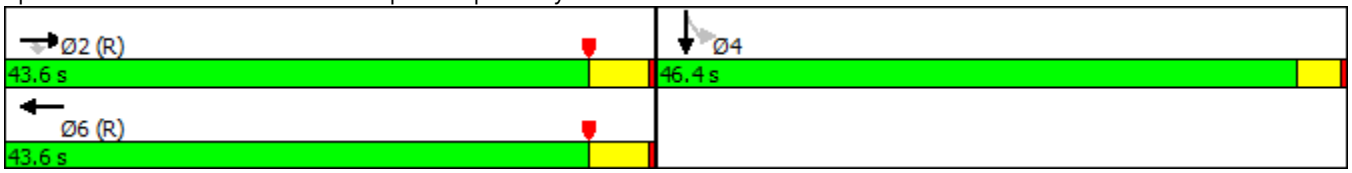
Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1417	73	794	641	0
Future Volume (vph)	1417	73	794	641	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	40.6	40.6	40.6	41.4	41.4
Actuated g/C Ratio	0.45	0.45	0.45	0.46	0.46
v/c Ratio	0.81	0.13	0.58	0.94	0.85
Control Delay	25.4	4.0	13.8	46.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	4.0	13.8	46.7	32.6
LOS	C	A	B	D	C
Approach Delay	24.4		13.8		40.0
Approach LOS	C		B		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 25.8	Intersection LOS: C
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	✥	
Traffic Volume (veh/h)	0	1417	73	0	794	204	0	0	0	641	0	365
Future Volume (veh/h)	0	1417	73	0	794	204	0	0	0	641	0	365
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1794	0	0	1005	258				566	343	321
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2370	738	0	1881	482				694	367	344
Arrive On Green	0.00	0.48	0.00	0.00	0.96	0.96				0.43	0.43	0.43
Sat Flow, veh/h	0	5076	1530	0	4062	1000				1619	857	802
Grp Volume(v), veh/h	0	1794	0	0	844	419				566	0	664
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1624				1619	0	1659
Q Serve(g_s), s	0.0	26.8	0.0	0.0	1.7	1.7				27.6	0.0	34.3
Cycle Q Clear(g_c), s	0.0	26.8	0.0	0.0	1.7	1.7				27.6	0.0	34.3
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.48
Lane Grp Cap(c), veh/h	0	2370	738	0	1580	783				694	0	711
V/C Ratio(X)	0.00	0.76	0.00	0.00	0.53	0.54				0.82	0.00	0.93
Avail Cap(c_a), veh/h	0	2370	738	0	1580	783				772	0	791
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.0	0.0	0.0	0.9	0.9				22.6	0.0	24.5
Incr Delay (d2), s/veh	0.0	2.3	0.0	0.0	1.3	2.6				5.5	0.0	16.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.5	0.0	0.0	0.8	1.0				13.3	0.0	18.9
LnGrp Delay(d),s/veh	0.0	21.3	0.0	0.0	2.2	3.5				28.0	0.0	40.8
LnGrp LOS		C			A	A				C		D
Approach Vol, veh/h		1794			1263						1230	
Approach Delay, s/veh		21.3			2.6						34.9	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		47.9		42.1		47.9		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		28.8		36.3		3.7		
Green Ext Time (p_c), s		9.1		2.3		25.3		

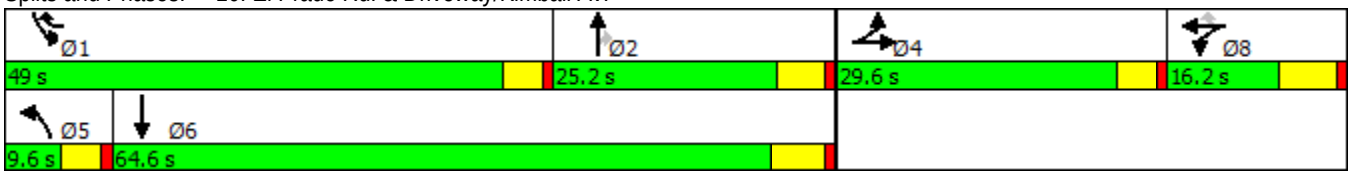
Intersection Summary	
HCM 2010 Ctrl Delay	19.7
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	1	27	1294	5	288	32	841	209
Future Volume (vph)	12	1	27	1294	5	288	32	841	209
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	58.0	5.1	20.2	20.2	45.6	60.1
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.21	0.21	0.48	0.63
v/c Ratio	0.06	0.01	0.31	1.13	0.06	0.78	0.07	1.11	0.12
Control Delay	40.2	30.3	50.0	82.3	52.6	54.0	0.3	96.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.3	50.0	82.3	52.6	54.0	0.3	96.5	9.3
LOS	D	C	D	F	D	D	A	F	A
Approach Delay		38.2	80.9			48.6			76.4
Approach LOS		D	F			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 75.1	Intersection LOS: E
Intersection Capacity Utilization 120.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	2	29	27	1294	5	288	32	841	209	44
Future Volume (veh/h)	12	1	2	29	27	1294	5	288	32	841	209	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	1	1	30	28	459	5	294	33	858	213	45
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	52	27	27	94	87	859	84	338	287	742	1676	347
Arrive On Green	0.03	0.03	0.03	0.10	0.10	0.10	0.05	0.19	0.19	0.46	0.59	0.59
Sat Flow, veh/h	1619	827	827	908	847	1530	1619	1800	1530	1619	2821	585
Grp Volume(v), veh/h	12	0	2	58	0	459	5	294	33	858	127	131
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1696
Q Serve(g_s), s	0.7	0.0	0.1	3.0	0.0	10.0	0.3	15.4	1.7	44.4	3.2	3.3
Cycle Q Clear(g_c), s	0.7	0.0	0.1	3.0	0.0	10.0	0.3	15.4	1.7	44.4	3.2	3.3
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	52	0	54	181	0	859	84	338	287	742	1016	1008
V/C Ratio(X)	0.23	0.00	0.04	0.32	0.00	0.53	0.06	0.87	0.11	1.16	0.13	0.13
Avail Cap(c_a), veh/h	418	0	427	181	0	859	84	371	316	742	1037	1029
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	0.0	45.4	40.3	0.0	13.3	43.7	38.2	32.7	26.3	8.6	8.6
Incr Delay (d2), s/veh	2.2	0.0	0.3	1.0	0.0	0.6	0.1	18.3	0.2	85.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	1.5	0.0	7.7	0.1	9.3	0.7	37.4	1.5	1.5
LnGrp Delay(d),s/veh	47.9	0.0	45.7	41.3	0.0	14.0	43.8	56.5	32.9	111.8	8.7	8.7
LnGrp LOS	D		D	D		B	D	E	C	F	A	A
Approach Vol, veh/h		14			517			332			1116	
Approach Delay, s/veh		47.6			17.1			53.9			87.9	
Approach LOS		D			B			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	49.0	24.0		7.7	9.6	63.4		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	46.4	17.4		2.7	2.3	5.3		12.0
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	3.4		0.0

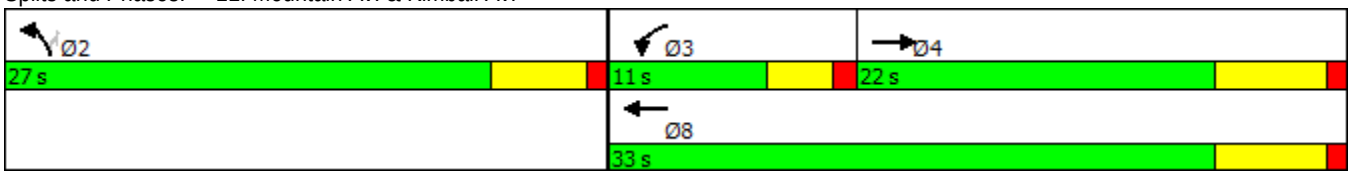
Intersection Summary	
HCM 2010 Ctrl Delay	63.4
HCM 2010 LOS	E

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	762	133	1118	277	51
Future Volume (vph)	762	133	1118	277	51
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	16.5	7.2	24.7	12.9	12.9
Actuated g/C Ratio	0.33	0.15	0.50	0.26	0.26
v/c Ratio	0.81	0.59	0.68	0.69	0.12
Control Delay	25.4	36.7	12.4	25.9	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	36.7	12.4	25.9	5.5
LOS	C	D	B	C	A
Approach Delay	25.4		15.0	22.7	
Approach LOS	C		B	C	

Intersection Summary		
Cycle Length: 60		
Actuated Cycle Length: 49.3		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.81		
Intersection Signal Delay: 19.8	Intersection LOS: B	
Intersection Capacity Utilization 64.7%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	762	129	133	1118	277	51
Future Volume (veh/h)	762	129	133	1118	277	51
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	794	129	139	1165	289	48
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	964	157	203	1843	353	334
Arrive On Green	0.33	0.33	0.13	0.54	0.22	0.22
Sat Flow, veh/h	3037	479	1619	3510	1619	1530
Grp Volume(v), veh/h	461	462	139	1165	289	48
Grp Sat Flow(s),veh/h/ln	1710	1716	1619	1710	1619	1530
Q Serve(g_s), s	11.5	11.5	3.8	11.1	7.9	1.2
Cycle Q Clear(g_c), s	11.5	11.5	3.8	11.1	7.9	1.2
Prop In Lane		0.28	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	560	561	203	1843	353	334
V/C Ratio(X)	0.82	0.82	0.68	0.63	0.82	0.14
Avail Cap(c_a), veh/h	589	590	244	1986	756	714
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.4	14.4	19.4	7.5	17.3	14.7
Incr Delay (d2), s/veh	8.2	8.1	3.9	0.4	1.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	6.7	1.9	5.3	3.7	0.5
LnGrp Delay(d),s/veh	22.6	22.5	23.3	7.9	19.1	14.7
LnGrp LOS	C	C	C	A	B	B
Approach Vol, veh/h	923			1304	337	
Approach Delay, s/veh	22.6			9.5	18.5	
Approach LOS	C			A	B	

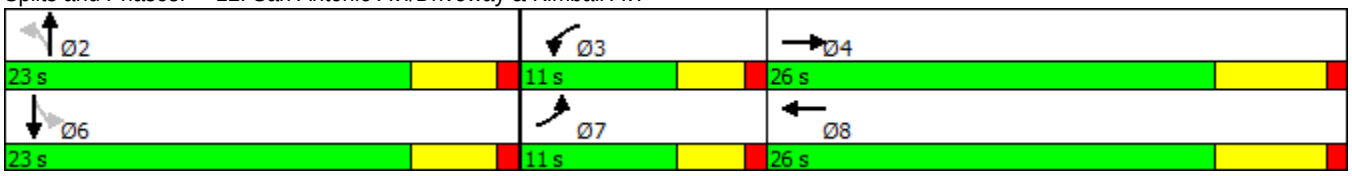
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		15.4	9.8	21.2				31.1
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		9.9	5.8	13.5				13.1
Green Ext Time (p_c), s		0.2	0.0	1.7				5.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	694	37	1255	64	0	46	0
Future Volume (vph)	38	694	37	1255	64	0	46	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	26.0	11.0	26.0	23.0	23.0	23.0	23.0
Total Split (%)	18.3%	43.3%	18.3%	43.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.3	20.7	7.3	20.7	9.0	9.0	9.0	9.0
Actuated g/C Ratio	0.16	0.46	0.16	0.46	0.20	0.20	0.20	0.20
v/c Ratio	0.15	0.51	0.15	0.85	0.26	0.03	0.19	0.01
Control Delay	21.7	11.8	21.6	22.4	18.9	0.1	17.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	11.8	21.6	22.4	18.9	0.1	17.9	0.0
LOS	C	B	C	C	B	A	B	A
Approach Delay		12.3		22.4		15.3		16.2
Approach LOS		B		C		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44.7	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 18.4	Intersection LOS: B
Intersection Capacity Utilization 56.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	694	65	37	1255	18	64	0	15	46	0	5
Future Volume (veh/h)	38	694	65	37	1255	18	64	0	15	46	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	40	738	69	39	1335	19	68	0	13	49	0	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1386	130	98	1512	22	377	0	245	370	0	245
Arrive On Green	0.06	0.44	0.44	0.06	0.44	0.44	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	1619	3156	295	1619	3452	49	1354	0	1530	1344	0	1530
Grp Volume(v), veh/h	40	400	407	39	661	693	68	0	13	49	0	5
Grp Sat Flow(s),veh/h/ln	1619	1710	1741	1619	1710	1791	1354	0	1530	1344	0	1530
Q Serve(g_s), s	1.0	7.5	7.5	1.0	15.5	15.5	2.0	0.0	0.3	1.4	0.0	0.1
Cycle Q Clear(g_c), s	1.0	7.5	7.5	1.0	15.5	15.5	2.1	0.0	0.3	1.7	0.0	0.1
Prop In Lane	1.00		0.17	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	751	764	98	749	785	377	0	245	370	0	245
V/C Ratio(X)	0.40	0.53	0.53	0.40	0.88	0.88	0.18	0.00	0.05	0.13	0.00	0.02
Avail Cap(c_a), veh/h	259	781	795	259	781	819	721	0	633	711	0	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.8	9.0	9.0	19.8	11.3	11.3	16.4	0.0	15.6	16.3	0.0	15.5
Incr Delay (d2), s/veh	1.0	0.3	0.3	1.0	10.8	10.4	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.5	3.6	0.5	9.4	9.8	0.7	0.0	0.1	0.5	0.0	0.1
LnGrp Delay(d),s/veh	20.7	9.3	9.3	20.8	22.0	21.7	16.4	0.0	15.6	16.4	0.0	15.5
LnGrp LOS	C	A	A	C	C	C	B		B	B		B
Approach Vol, veh/h		847			1393			81			54	
Approach Delay, s/veh		9.8			21.8			16.3			16.3	
Approach LOS		A			C			B			B	

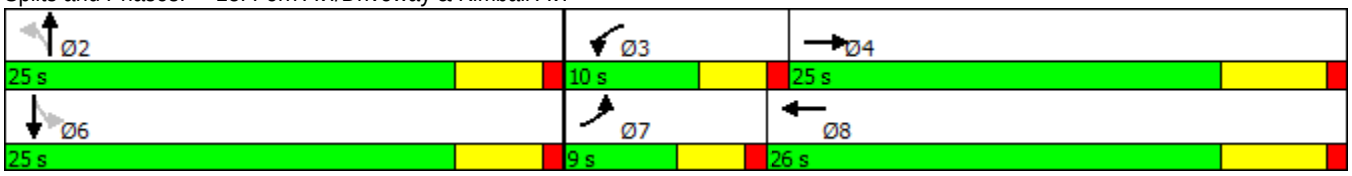
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.6	25.2		11.9	6.7	25.2
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		4.1	3.0	9.5		3.7	3.0	17.5
Green Ext Time (p_c), s		0.1	0.0	4.7		0.1	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	37	640	39	1303	46	0	65	1
Future Volume (vph)	37	640	39	1303	46	0	65	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	20.8	5.5	21.2	8.1	8.1	8.1	8.1
Actuated g/C Ratio	0.12	0.48	0.13	0.49	0.19	0.19	0.19	0.19
v/c Ratio	0.21	0.48	0.21	0.88	0.21	0.06	0.31	0.03
Control Delay	24.4	11.2	23.4	23.2	17.4	0.2	19.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	11.2	23.4	23.2	17.4	0.2	19.0	9.6
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.8		23.2		11.2		17.8
Approach LOS		B		C		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	640	67	39	1303	20	46	0	26	65	1	8
Future Volume (veh/h)	37	640	67	39	1303	20	46	0	26	65	1	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	41	711	67	43	1448	22	51	0	19	72	1	8
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	74	1492	140	77	1637	25	334	0	187	325	21	169
Arrive On Green	0.05	0.47	0.47	0.05	0.47	0.47	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1619	3153	297	1619	3448	52	1349	0	1530	1337	173	1383
Grp Volume(v), veh/h	41	385	393	43	718	752	51	0	19	72	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1740	1619	1710	1791	1349	0	1530	1337	0	1556
Q Serve(g_s), s	1.0	6.3	6.3	1.1	15.5	15.6	1.4	0.0	0.5	2.1	0.0	0.2
Cycle Q Clear(g_c), s	1.0	6.3	6.3	1.1	15.5	15.6	1.6	0.0	0.5	2.5	0.0	0.2
Prop In Lane	1.00		0.17	1.00		0.03	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	74	809	823	77	812	850	334	0	187	325	0	190
V/C Ratio(X)	0.56	0.48	0.48	0.56	0.88	0.88	0.15	0.00	0.10	0.22	0.00	0.05
Avail Cap(c_a), veh/h	198	809	823	238	850	890	833	0	753	819	0	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	7.3	7.3	19.1	9.7	9.7	16.5	0.0	15.9	17.1	0.0	15.8
Incr Delay (d2), s/veh	2.4	0.2	0.2	2.4	10.1	9.8	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.9	3.0	0.5	9.5	9.8	0.5	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	21.5	7.5	7.5	21.4	19.8	19.5	16.6	0.0	16.0	17.2	0.0	15.9
LnGrp LOS	C	A	A	C	B	B	B		B	B		B
Approach Vol, veh/h		819			1513			70			81	
Approach Delay, s/veh		8.2			19.7			16.5			17.0	
Approach LOS		A			B			B			B	

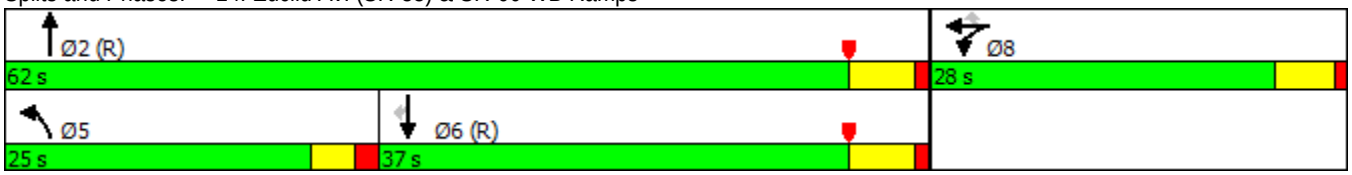
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	5.9	25.0		9.9	5.9	25.1
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.6	3.1	8.3		4.5	3.0	17.6
Green Ext Time (p_c), s		0.1	0.0	5.1		0.1	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	795	2	386	467	984	1062	489
Future Volume (vph)	795	2	386	467	984	1062	489
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.0	23.0	23.0	20.5	56.5	31.5	31.5
Actuated g/C Ratio	0.26	0.26	0.26	0.23	0.63	0.35	0.35
v/c Ratio	1.16	1.12	0.82	1.37	0.49	0.95	0.62
Control Delay	128.1	114.2	38.3	196.5	22.0	46.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	2.8	2.5	0.0
Total Delay	128.1	114.2	38.3	196.5	24.8	49.2	5.7
LOS	F	F	D	F	C	D	A
Approach Delay		96.9			80.0	35.5	
Approach LOS		F			F	D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 68.3	Intersection LOS: E
Intersection Capacity Utilization 139.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	795	2	386	467	984	0	0	1062	489
Future Volume (veh/h)	0	0	0	795	2	386	467	984	0	0	1062	489
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				937	0	174	502	1058	0	0	1142	526
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				828	0	391	369	2147	0	0	1197	515
Arrive On Green				0.26	0.00	0.26	0.46	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1473
Grp Volume(v), veh/h				937	0	174	502	1058	0	0	1142	526
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1473
Q Serve(g_s), s				23.0	0.0	8.6	20.5	0.0	0.0	0.0	29.3	31.5
Cycle Q Clear(g_c), s				23.0	0.0	8.6	20.5	0.0	0.0	0.0	29.3	31.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				828	0	391	369	2147	0	0	1197	515
V/C Ratio(X)				1.13	0.00	0.45	1.36	0.49	0.00	0.00	0.95	1.02
Avail Cap(c_a), veh/h				828	0	391	369	2147	0	0	1197	515
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.22	0.22	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.5	0.0	28.1	24.5	0.0	0.0	0.0	28.5	29.3
Incr Delay (d2), s/veh				74.4	0.0	0.3	166.5	0.2	0.0	0.0	17.1	44.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				18.8	0.0	3.7	26.1	0.1	0.0	0.0	16.6	19.2
LnGrp Delay(d),s/veh				107.9	0.0	28.4	191.0	0.2	0.0	0.0	45.6	74.2
LnGrp LOS				F		C	F	A			D	F
Approach Vol, veh/h					1111			1560			1668	
Approach Delay, s/veh					95.5			61.6			54.6	
Approach LOS					F			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			25.0	37.0		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			22.5	33.5		25.0
Green Ext Time (p_c), s		43.4			0.0	0.0		0.0

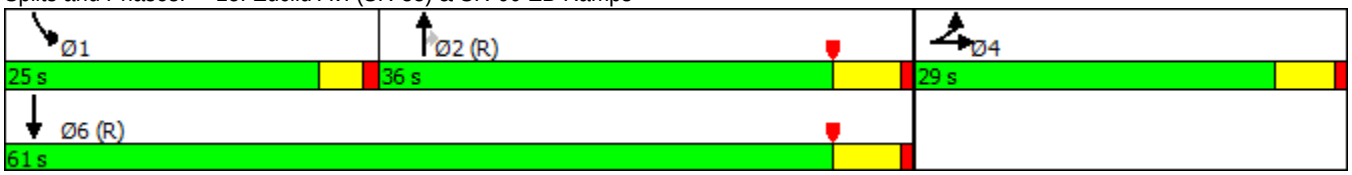
Intersection Summary	
HCM 2010 Ctrl Delay	67.6
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	344	0	1106	659	305	1552
Future Volume (vph)	344	0	1106	659	305	1552
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	31.5	31.5	20.0	55.5
Actuated g/C Ratio	0.27	0.27	0.35	0.35	0.22	0.62
v/c Ratio	0.80	1.64	0.98	0.74	0.91	0.78
Control Delay	47.7	322.6	52.7	8.2	43.5	6.2
Queue Delay	7.6	1.1	0.0	0.0	0.0	6.0
Total Delay	55.3	323.7	52.7	8.2	43.5	12.3
LOS	E	F	D	A	D	B
Approach Delay		240.7	36.1			17.4
Approach LOS		F	D			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.64	
Intersection Signal Delay: 72.9	Intersection LOS: E
Intersection Capacity Utilization 139.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	0	656	0	0	0	0	1106	659	305	1552	0
Future Volume (veh/h)	344	0	656	0	0	0	0	1106	659	305	1552	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	366	0	615				0	1177	701	324	1651	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	432	0	408				0	1214	540	352	2109	0
Arrive On Green	0.27	0.00	0.27				0.00	0.36	0.36	0.29	0.82	0.00
Sat Flow, veh/h	1619	0	1530				0	3510	1521	1619	3510	0
Grp Volume(v), veh/h	366	0	615				0	1177	701	324	1651	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1521	1619	1710	0
Q Serve(g_s), s	19.3	0.0	24.0				0.0	30.5	32.0	17.5	21.8	0.0
Cycle Q Clear(g_c), s	19.3	0.0	24.0				0.0	30.5	32.0	17.5	21.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	408				0	1214	540	352	2109	0
V/C Ratio(X)	0.85	0.00	1.51				0.00	0.97	1.30	0.92	0.78	0.00
Avail Cap(c_a), veh/h	432	0	408				0	1214	540	378	2109	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.70	0.70	0.09	0.09	0.00
Uniform Delay (d), s/veh	31.3	0.0	33.0				0.0	28.5	29.0	31.3	5.1	0.0
Incr Delay (d2), s/veh	13.9	0.0	240.7				0.0	15.5	143.4	3.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	0.0	37.4				0.0	17.0	34.9	8.1	9.7	0.0
LnGrp Delay(d),s/veh	45.2	0.0	273.7				0.0	44.0	172.5	34.9	5.3	0.0
LnGrp LOS	D		F					D	F	C	A	
Approach Vol, veh/h		981						1878			1975	
Approach Delay, s/veh		188.5						91.9			10.2	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.5	37.5		29.0		61.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	19.5	34.0		26.0		23.8		
Green Ext Time (p_c), s	0.1	0.0		0.0		30.5		

Intersection Summary	
HCM 2010 Ctrl Delay	78.1
HCM 2010 LOS	E

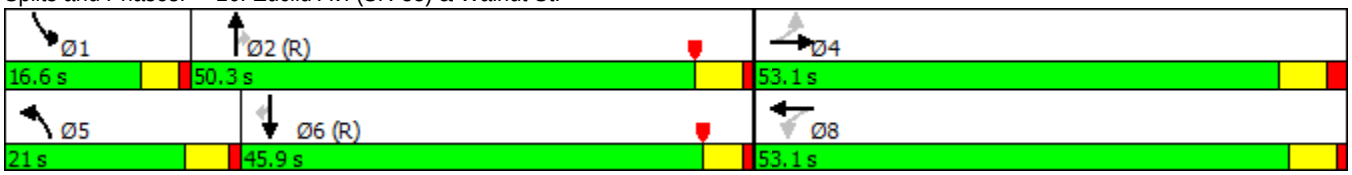
Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	155	345	95	319	118	1410	55	163	1759	59
Future Volume (vph)	155	345	95	319	118	1410	55	163	1759	59
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	35.0	35.0	36.0	36.0	13.6	58.2	58.2	10.8	55.7	55.7
Actuated g/C Ratio	0.29	0.29	0.30	0.30	0.11	0.48	0.48	0.09	0.46	0.46
v/c Ratio	1.00	0.49	0.52	0.50	0.68	0.62	0.07	0.65	0.81	0.08
Control Delay	112.3	32.2	42.4	27.6	56.5	23.9	5.9	64.5	33.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.3	32.2	42.4	27.6	56.5	23.9	5.9	64.5	33.7	5.3
LOS	F	C	D	C	E	C	A	E	C	A
Approach Delay		52.4		30.0		25.7			35.4	
Approach LOS		D		C		C			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 33.7 — Intersection LOS: C
Intersection Capacity Utilization 86.7% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	345	112	95	319	178	118	1410	55	163	1759	59
Future Volume (veh/h)	155	345	112	95	319	178	118	1410	55	163	1759	59
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	163	363	96	100	336	154	124	1484	39	172	1852	33
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	262	934	244	279	795	357	149	2179	678	220	2074	645
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.03	0.15	0.15	0.07	0.42	0.42
Sat Flow, veh/h	869	2684	701	895	2283	1025	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	163	230	229	100	250	240	124	1484	39	172	1852	33
Grp Sat Flow(s),veh/h/ln	869	1710	1676	895	1710	1598	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	21.3	12.1	12.4	11.4	13.4	13.8	9.1	34.4	2.6	6.9	41.9	1.5
Cycle Q Clear(g_c), s	35.1	12.1	12.4	23.8	13.4	13.8	9.1	34.4	2.6	6.9	41.9	1.5
Prop In Lane	1.00		0.42	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	595	583	279	595	556	149	2179	678	220	2074	645
V/C Ratio(X)	0.62	0.39	0.39	0.36	0.42	0.43	0.83	0.68	0.06	0.78	0.89	0.05
Avail Cap(c_a), veh/h	299	667	653	324	681	637	217	2179	678	298	2074	645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.38	0.38	0.38	0.53	0.53	0.53
Uniform Delay (d), s/veh	43.5	29.5	29.5	38.5	29.9	30.0	57.2	43.2	29.6	54.6	32.2	20.5
Incr Delay (d2), s/veh	3.2	0.4	0.4	0.8	0.5	0.5	6.8	0.7	0.1	3.3	3.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	5.8	5.8	2.9	6.4	6.2	4.4	15.8	1.1	2.9	19.5	0.7
LnGrp Delay(d),s/veh	46.7	29.9	30.0	39.3	30.3	30.5	64.0	43.8	29.7	57.9	35.7	20.6
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	D	C
Approach Vol, veh/h		622			590			1647			2057	
Approach Delay, s/veh		34.3			31.9			45.0			37.3	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.4	58.5		48.1	16.0	56.0		48.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	8.9	36.4		37.1	11.1	43.9		25.8
Green Ext Time (p_c), s	0.1	8.0		4.7	0.1	0.0		7.1

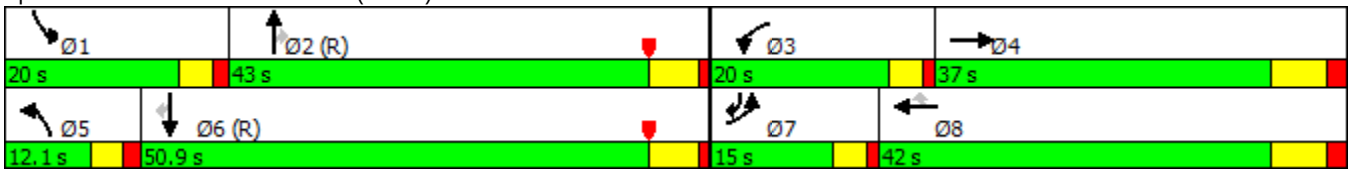
Intersection Summary	
HCM 2010 Ctrl Delay	38.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	148	337	184	396	52	66	1004	176	186	1172	153
Future Volume (vph)	148	337	184	396	52	66	1004	176	186	1172	153
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	15.0	37.0	20.0	42.0	42.0	12.1	43.0	43.0	20.0	50.9	15.0
Total Split (%)	12.5%	30.8%	16.7%	35.0%	35.0%	10.1%	35.8%	35.8%	16.7%	42.4%	12.5%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.0	21.2	15.7	25.9	25.9	9.8	42.4	42.4	19.7	54.6	71.1
Actuated g/C Ratio	0.09	0.18	0.13	0.22	0.22	0.08	0.35	0.35	0.16	0.46	0.59
v/c Ratio	1.05	0.69	0.92	0.57	0.13	0.53	0.88	0.28	0.74	0.79	0.17
Control Delay	141.4	50.3	96.6	44.5	0.6	86.7	30.9	3.1	81.1	13.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	141.4	50.3	96.6	44.5	0.6	86.7	30.9	3.1	81.1	13.2	0.3
LOS	F	D	F	D	A	F	C	A	F	B	A
Approach Delay		75.2		56.0			29.9			20.3	
Approach LOS		E		E			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 36.7	Intersection LOS: D
Intersection Capacity Utilization 81.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	337	57	184	396	52	66	1004	176	186	1172	153
Future Volume (veh/h)	148	337	57	184	396	52	66	1004	176	186	1172	153
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	156	355	37	194	417	50	69	1057	104	196	1234	95
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	148	542	56	216	735	329	86	1331	595	209	1592	852
Arrive On Green	0.09	0.17	0.17	0.13	0.22	0.22	0.07	0.52	0.52	0.17	0.62	0.62
Sat Flow, veh/h	1619	3124	323	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	156	193	199	194	417	50	69	1057	104	196	1234	95
Grp Sat Flow(s),veh/h/ln	1619	1710	1737	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	11.0	12.6	12.8	14.2	13.1	3.2	5.0	30.4	4.3	14.3	31.7	2.6
Cycle Q Clear(g_c), s	11.0	12.6	12.8	14.2	13.1	3.2	5.0	30.4	4.3	14.3	31.7	2.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	296	301	216	735	329	86	1331	595	209	1592	852
V/C Ratio(X)	1.05	0.65	0.66	0.90	0.57	0.15	0.81	0.79	0.17	0.94	0.78	0.11
Avail Cap(c_a), veh/h	148	428	434	216	998	446	103	1331	595	209	1592	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.66	0.66	0.66	0.50	0.50	0.50
Uniform Delay (d), s/veh	54.5	46.2	46.3	51.2	42.1	38.2	55.2	25.0	18.7	49.2	18.3	8.8
Incr Delay (d2), s/veh	88.1	3.4	3.5	34.3	1.0	0.3	22.5	3.3	0.4	28.9	1.9	0.1
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	6.2	6.4	8.4	6.3	1.4	2.8	14.9	1.9	8.1	15.3	1.1
LnGrp Delay(d),s/veh	142.7	49.6	49.8	85.5	43.1	38.5	77.7	28.3	19.2	78.1	20.2	8.9
LnGrp LOS	F	D	D	F	D	D	E	C	B	E	C	A
Approach Vol, veh/h		548			661			1230			1525	
Approach Delay, s/veh		76.2			55.2			30.3			26.9	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	52.2	20.0	27.8	10.8	61.4	15.0	32.8
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	37.5	16.0	30.0	7.6	45.4	11.0	35.0
Max Q Clear Time (g_c+I1), s	16.3	32.4	16.2	14.8	7.0	33.7	13.0	15.1
Green Ext Time (p_c), s	0.0	4.6	0.0	5.8	0.0	9.6	0.0	6.6

Intersection Summary	
HCM 2010 Ctrl Delay	39.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	103	126	70	67	164	71	1377	141	30	1774	100
Future Volume (vph)	103	126	70	67	164	71	1377	141	30	1774	100
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.8	26.8	26.8		26.8	9.9	73.4	73.4	6.9	68.7	68.7
Actuated g/C Ratio	0.22	0.22	0.22		0.22	0.08	0.61	0.61	0.06	0.57	0.57
v/c Ratio	0.66	0.33	0.18		0.83	0.57	0.69	0.15	0.35	0.95	0.12
Control Delay	60.6	39.8	5.3		62.2	66.7	19.4	4.3	48.1	51.0	13.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	39.8	5.3		62.2	66.7	19.4	4.3	48.1	51.0	13.6
LOS	E	D	A		E	E	B	A	D	D	B
Approach Delay		38.8			62.2		20.2			49.0	
Approach LOS		D			E		C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 37.8	Intersection LOS: D
Intersection Capacity Utilization 98.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	126	70	67	164	37	71	1377	141	30	1774	100
Future Volume (veh/h)	103	126	70	67	164	37	71	1377	141	30	1774	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	108	133	50	71	173	35	75	1449	112	32	1867	76
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	204	417	350	106	222	42	92	2064	923	44	1963	877
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.11	1.00	1.00	0.02	0.38	0.38
Sat Flow, veh/h	1126	1800	1510	295	958	180	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	108	133	50	279	0	0	75	1449	112	32	1867	76
Grp Sat Flow(s),veh/h/ln	1126	1800	1510	1432	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	0.7	7.4	3.2	15.5	0.0	0.0	5.4	0.0	0.0	2.4	63.6	3.8
Cycle Q Clear(g_c), s	23.6	7.4	3.2	22.9	0.0	0.0	5.4	0.0	0.0	2.4	63.6	3.8
Prop In Lane	1.00		1.00	0.25		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	204	417	350	369	0	0	92	2064	923	44	1963	877
V/C Ratio(X)	0.53	0.32	0.14	0.76	0.00	0.00	0.81	0.70	0.12	0.72	0.95	0.09
Avail Cap(c_a), veh/h	290	555	466	490	0	0	169	2064	923	101	1963	877
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.52	0.52	0.52	0.48	0.48	0.48
Uniform Delay (d), s/veh	44.9	38.3	36.6	44.8	0.0	0.0	52.5	0.0	0.0	58.5	35.3	16.9
Incr Delay (d2), s/veh	2.1	0.4	0.2	4.7	0.0	0.0	3.4	1.0	0.1	4.0	6.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	3.7	1.3	9.3	0.0	0.0	2.5	0.3	0.0	1.1	31.9	1.6
LnGrp Delay(d),s/veh	47.0	38.7	36.8	49.5	0.0	0.0	55.9	1.0	0.1	62.4	41.9	17.0
LnGrp LOS	D	D	D	D			E	A	A	E	D	B
Approach Vol, veh/h		291			279			1636			1975	
Approach Delay, s/veh		41.5			49.5			3.5			41.3	
Approach LOS		D			D			A			D	

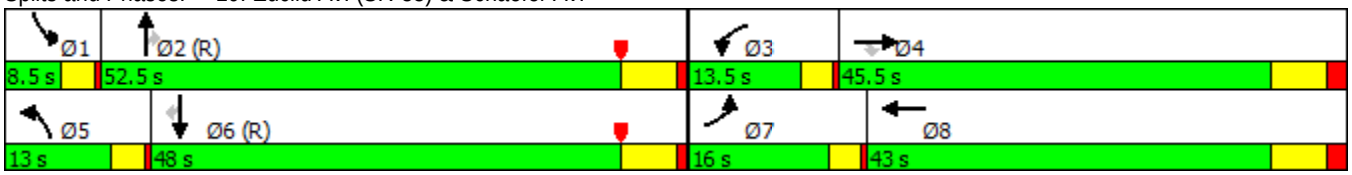
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	78.4		34.8	10.3	74.9		34.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.4	2.0		25.6	7.4	65.6		24.9
Green Ext Time (p_c), s	0.0	46.4		2.2	0.0	0.0		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	27.1
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	142	62	121	60	121	121	1455	22	15	1731	134
Future Volume (vph)	142	62	121	60	121	121	1455	22	15	1731	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.4	22.8	22.8	10.0	17.7	14.9	69.7	69.7	5.4	55.0	55.0
Actuated g/C Ratio	0.10	0.19	0.19	0.08	0.15	0.12	0.58	0.58	0.04	0.46	0.46
v/c Ratio	0.91	0.19	0.33	0.48	0.56	0.65	0.78	0.02	0.22	1.17	0.19
Control Delay	103.1	40.6	8.0	65.0	51.5	41.5	33.0	1.7	60.8	113.9	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.1	40.6	8.0	65.0	51.5	41.5	33.0	1.7	60.8	113.9	8.1
LOS	F	D	A	E	D	D	C	A	E	F	A
Approach Delay		55.7			55.6		33.2			105.9	
Approach LOS		E			E		C			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 70.3	Intersection LOS: E
Intersection Capacity Utilization 92.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	62	121	60	121	18	121	1455	22	15	1731	134
Future Volume (veh/h)	142	62	121	60	121	18	121	1455	22	15	1731	134
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	151	66	77	64	129	17	129	1548	18	16	1841	95
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	169	245	209	119	165	22	128	2074	928	28	1862	813
Arrive On Green	0.10	0.14	0.14	0.07	0.11	0.11	0.03	0.20	0.20	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1558	205	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	151	66	77	64	0	146	129	1548	18	16	1841	95
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	11.1	3.9	5.5	4.6	0.0	9.7	9.5	51.1	1.1	1.2	64.4	6.4
Cycle Q Clear(g_c), s	11.1	3.9	5.5	4.6	0.0	9.7	9.5	51.1	1.1	1.2	64.4	6.4
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	245	209	119	0	186	128	2074	928	28	1862	813
V/C Ratio(X)	0.90	0.27	0.37	0.54	0.00	0.78	1.01	0.75	0.02	0.57	0.99	0.12
Avail Cap(c_a), veh/h	169	578	491	135	0	529	128	2074	928	67	1862	813
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.21	0.21	0.21	0.26	0.26	0.26
Uniform Delay (d), s/veh	53.1	46.5	47.1	53.6	0.0	52.3	58.4	39.3	19.3	59.2	48.9	25.0
Incr Delay (d2), s/veh	39.9	0.4	0.8	1.4	0.0	5.3	38.4	0.5	0.0	1.8	8.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	2.0	2.4	2.1	0.0	5.0	5.6	24.4	0.5	0.5	32.7	2.7
LnGrp Delay(d),s/veh	93.0	46.9	47.9	55.0	0.0	57.7	96.8	39.9	19.4	61.0	57.3	25.1
LnGrp LOS	F	D	D	E		E	F	D	B	E	E	C
Approach Vol, veh/h		294			210			1695			1952	
Approach Delay, s/veh		70.9			56.9			44.0			55.7	
Approach LOS		E			E			D			E	

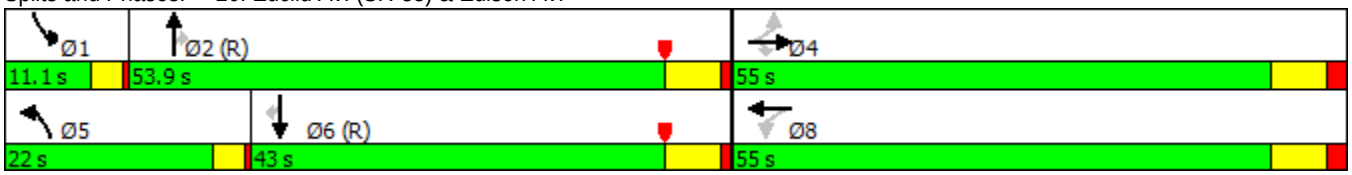
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	78.8	12.3	23.4	13.0	71.3	16.0	19.7
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	53.1	6.6	7.5	11.5	66.4	13.1	11.7
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	52.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	218	169	240	71	349	252	1304	38	41	1577	252
Future Volume (vph)	218	169	240	71	349	252	1304	38	41	1577	252
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	46.5	46.5	46.5	46.5	46.5	20.0	51.9	51.9	6.8	37.0	37.0
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.17	0.43	0.43	0.06	0.31	0.31
v/c Ratio	1.00	0.26	0.34	0.18	0.60	1.00	0.94	0.06	0.48	1.59	0.49
Control Delay	96.5	25.8	4.1	25.0	32.9	92.8	48.4	5.0	83.0	286.9	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.5	25.8	4.1	25.0	32.9	92.8	48.4	5.0	83.0	286.9	2.9
LOS	F	C	A	C	C	F	D	A	F	F	A
Approach Delay		42.1			31.7		54.4			244.2	
Approach LOS		D			C		D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.59	
Intersection Signal Delay: 128.4	Intersection LOS: F
Intersection Capacity Utilization 117.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	169	240	71	349	40	252	1304	38	41	1577	252
Future Volume (veh/h)	218	169	240	71	349	40	252	1304	38	41	1577	252
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	232	180	188	76	371	41	268	1387	25	44	1678	237
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	720	612	384	637	70	250	1467	656	54	1054	471
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.21	0.57	0.57	0.04	0.41	0.41
Sat Flow, veh/h	934	1800	1530	973	1593	176	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	232	180	188	76	0	412	268	1387	25	44	1678	237
Grp Sat Flow(s),veh/h/ln	934	1800	1530	973	0	1769	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	26.1	8.0	10.1	6.8	0.0	21.9	18.5	45.4	0.9	3.2	37.0	13.8
Cycle Q Clear(g_c), s	48.0	8.0	10.1	14.8	0.0	21.9	18.5	45.4	0.9	3.2	37.0	13.8
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	720	612	384	0	708	250	1467	656	54	1055	471
V/C Ratio(X)	0.88	0.25	0.31	0.20	0.00	0.58	1.07	0.95	0.04	0.81	1.59	0.50
Avail Cap(c_a), veh/h	263	720	612	384	0	708	250	1467	656	103	1055	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.74	0.74	0.74	0.09	0.09	0.09
Uniform Delay (d), s/veh	48.5	24.0	24.6	28.9	0.0	28.2	47.7	24.5	14.9	56.9	35.4	28.6
Incr Delay (d2), s/veh	27.2	0.2	0.3	0.2	0.0	1.2	70.0	10.9	0.1	1.0	266.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	4.0	4.3	1.8	0.0	10.9	13.1	23.3	0.4	1.5	56.4	5.8
LnGrp Delay(d),s/veh	75.7	24.2	24.9	29.2	0.0	29.4	117.7	35.4	15.0	57.9	301.9	28.9
LnGrp LOS	E	C	C	C		C	F	D	B	E	F	C
Approach Vol, veh/h		600			488			1680			1959	
Approach Delay, s/veh		44.3			29.3			48.2			263.4	
Approach LOS		D			C			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	57.5		55.0	22.0	43.0		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.2	47.4		50.0	20.5	39.0		23.9
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	0.0		5.9

Intersection Summary		
HCM 2010 Ctrl Delay		134.9
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	55	7	215	23	45	179	1515	8	22	1830	28
Future Volume (vph)	55	7	215	23	45	179	1515	8	22	1830	28
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	50.3	50.3	50.3	50.3	50.3	21.0	60.0	60.0	9.7	48.7	48.7
Total Split (%)	41.9%	41.9%	41.9%	41.9%	41.9%	17.5%	50.0%	50.0%	8.1%	40.6%	40.6%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.8	15.8	15.8	15.8	15.8	18.3	86.9	86.9	6.8	71.9	71.9
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.15	0.72	0.72	0.06	0.60	0.60
v/c Ratio	0.36	0.03	0.57	0.14	0.31	0.76	0.64	0.01	0.25	0.93	0.03
Control Delay	49.0	36.6	10.2	41.4	28.9	61.0	9.8	0.0	72.5	18.7	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	36.6	10.2	41.4	28.9	61.0	9.8	0.0	72.5	18.7	1.6
LOS	D	D	B	D	C	E	A	A	E	B	A
Approach Delay		18.5			31.8		15.2			19.1	
Approach LOS		B			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 86.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	7	215	23	45	31	179	1515	8	22	1830	28
Future Volume (veh/h)	55	7	215	23	45	31	179	1515	8	22	1830	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	57	7	138	24	47	25	186	1578	8	23	1906	25
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	152	201	171	189	124	66	210	2563	1146	36	2195	960
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.13	0.75	0.75	0.01	0.21	0.21
Sat Flow, veh/h	1274	1800	1530	1193	1107	589	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	57	7	138	24	0	72	186	1578	8	23	1906	25
Grp Sat Flow(s),veh/h/ln	1274	1800	1530	1193	0	1696	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	5.2	0.4	10.6	2.2	0.0	4.7	13.6	25.8	0.2	1.7	64.6	1.6
Cycle Q Clear(g_c), s	9.9	0.4	10.6	2.6	0.0	4.7	13.6	25.8	0.2	1.7	64.6	1.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	152	201	171	189	0	189	210	2563	1146	36	2195	960
V/C Ratio(X)	0.37	0.03	0.81	0.13	0.00	0.38	0.88	0.62	0.01	0.64	0.87	0.03
Avail Cap(c_a), veh/h	493	683	580	508	0	643	236	2563	1146	84	2195	960
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.1	47.5	52.0	48.7	0.0	49.4	51.3	7.0	3.8	59.1	42.4	17.6
Incr Delay (d2), s/veh	1.1	0.1	6.6	0.2	0.0	0.9	27.6	1.1	0.0	1.3	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	4.8	0.7	0.0	2.3	7.7	12.5	0.1	0.8	30.8	0.7
LnGrp Delay(d),s/veh	55.2	47.6	58.6	48.9	0.0	50.4	78.9	8.1	3.8	60.3	42.9	17.6
LnGrp LOS	E	D	E	D		D	E	A	A	E	D	B
Approach Vol, veh/h		202			96			1772			1954	
Approach Delay, s/veh		57.3			50.0			15.5			42.8	
Approach LOS		E			D			B			D	

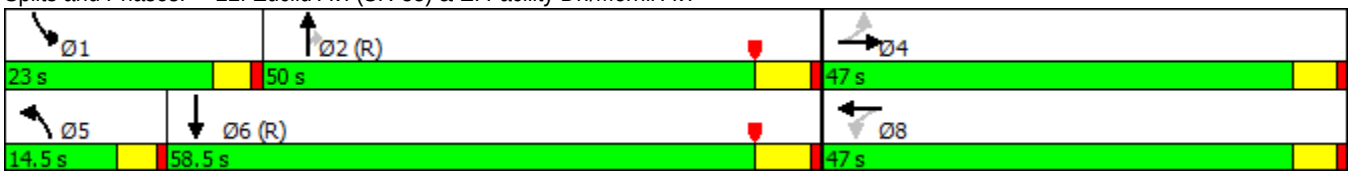
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	95.6		18.2	19.1	82.7		18.2
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	54.3		45.5	17.5	43.0		45.5
Max Q Clear Time (g_c+I1), s	3.7	27.8		12.6	15.6	66.6		6.7
Green Ext Time (p_c), s	0.0	24.2		0.8	0.1	0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	387	48	20	1079	183	480	1585
Future Volume (vph)	8	6	387	48	20	1079	183	480	1585
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		42.0		42.0	10.0	44.0	44.0	18.5	61.2
Actuated g/C Ratio		0.35		0.35	0.08	0.37	0.37	0.15	0.51
v/c Ratio		0.04		2.01	0.16	0.90	0.31	2.02	0.98
Control Delay		22.0		485.8	60.8	29.7	9.7	491.5	34.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.0		485.8	60.8	29.7	9.7	491.5	34.6
LOS		C		F	E	C	A	F	C
Approach Delay		22.0		485.8		27.3			138.6
Approach LOS		C		F		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.02	
Intersection Signal Delay: 187.8	Intersection LOS: F
Intersection Capacity Utilization 145.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	387	48	614	20	1079	183	480	1585	44
Future Volume (veh/h)	8	6	4	387	48	614	20	1079	183	480	1585	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	403	50	594	21	1124	165	500	1651	43
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	205	147	66	243	25	297	68	1254	561	250	1631	42
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.04	0.37	0.37	0.15	0.48	0.48
Sat Flow, veh/h	459	421	189	575	71	847	1619	3420	1530	1619	3406	88
Grp Volume(v), veh/h	17	0	0	1047	0	0	21	1124	165	500	827	867
Grp Sat Flow(s),veh/h/ln	1069	0	0	1493	0	0	1619	1710	1530	1619	1710	1784
Q Serve(g_s), s	0.0	0.0	0.0	41.2	0.0	0.0	1.5	37.2	9.2	18.5	57.5	57.5
Cycle Q Clear(g_c), s	0.8	0.0	0.0	42.0	0.0	0.0	1.5	37.2	9.2	18.5	57.5	57.5
Prop In Lane	0.47		0.18	0.38		0.57	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	418	0	0	564	0	0	68	1254	561	250	819	855
V/C Ratio(X)	0.04	0.00	0.00	1.86	0.00	0.00	0.31	0.90	0.29	2.00	1.01	1.01
Avail Cap(c_a), veh/h	418	0	0	564	0	0	135	1254	561	250	819	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	0.0	40.5	0.0	0.0	55.8	35.8	27.0	50.8	31.3	31.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	391.8	0.0	0.0	0.1	1.1	0.1	465.4	33.9	34.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	80.1	0.0	0.0	0.7	17.7	3.9	40.5	34.8	36.4
LnGrp Delay(d),s/veh	25.6	0.0	0.0	432.3	0.0	0.0	55.9	36.9	27.1	516.1	65.2	65.8
LnGrp LOS	C			F			E	D	C	F	F	F
Approach Vol, veh/h		17			1047			1310			2194	
Approach Delay, s/veh		25.6			432.3			36.0			168.2	
Approach LOS		C			F			D			F	

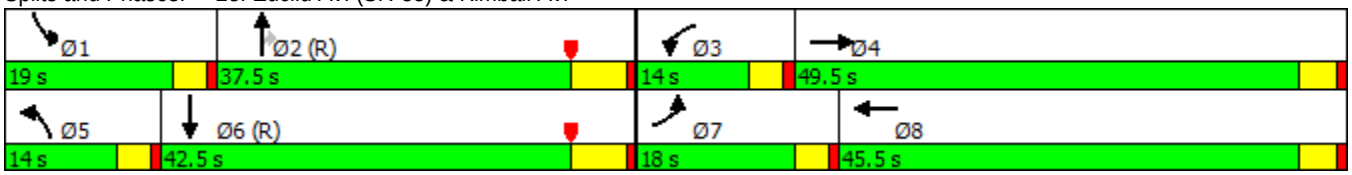
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	50.0		47.0	9.5	63.5		47.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	20.5	39.2		2.8	3.5	59.5		44.0
Green Ext Time (p_c), s	0.0	4.5		6.3	0.0	0.0		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		190.3	
HCM 2010 LOS		F	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	278	421	134	606	174	785	213	493	734
Future Volume (vph)	278	421	134	606	174	785	213	493	734
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	14.0	36.9	10.0	32.9	18.1	31.5	31.5	23.1	36.5
Actuated g/C Ratio	0.12	0.31	0.08	0.27	0.15	0.26	0.26	0.19	0.30
v/c Ratio	1.51	0.46	1.02	0.84	0.73	0.89	0.39	1.62	1.27
Control Delay	291.9	33.4	138.1	48.1	46.3	41.6	10.5	316.5	145.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	291.9	33.4	138.1	48.1	46.3	41.6	10.5	316.5	145.2
LOS	F	C	F	D	D	D	B	F	F
Approach Delay		129.9		61.5		36.7			190.8
Approach LOS		F		E		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.62	
Intersection Signal Delay: 117.4	Intersection LOS: F
Intersection Capacity Utilization 109.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	421	46	134	606	161	174	785	213	493	734	624
Future Volume (veh/h)	278	421	46	134	606	161	174	785	213	493	734	624
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	284	430	45	137	618	142	178	801	209	503	749	599
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	189	936	98	135	735	169	135	1156	517	202	690	540
Arrive On Green	0.12	0.30	0.30	0.08	0.27	0.27	0.03	0.11	0.11	0.13	0.38	0.38
Sat Flow, veh/h	1619	3127	326	1619	2764	634	1619	3420	1530	1619	1816	1422
Grp Volume(v), veh/h	284	234	241	137	382	378	178	801	209	503	704	644
Grp Sat Flow(s),veh/h/ln	1619	1710	1743	1619	1710	1688	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	14.0	13.3	13.5	10.0	25.3	25.4	10.0	27.1	15.3	15.0	45.6	45.6
Cycle Q Clear(g_c), s	14.0	13.3	13.5	10.0	25.3	25.4	10.0	27.1	15.3	15.0	45.6	45.6
Prop In Lane	1.00		0.19	1.00		0.38	1.00		1.00	1.00		0.93
Lane Grp Cap(c), veh/h	189	512	522	135	455	449	135	1156	517	202	649	580
V/C Ratio(X)	1.50	0.46	0.46	1.02	0.84	0.84	1.32	0.69	0.40	2.49	1.08	1.11
Avail Cap(c_a), veh/h	189	641	653	135	584	577	135	1156	517	202	649	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	0.11	0.11	0.11	0.15	0.15	0.15
Uniform Delay (d), s/veh	53.0	34.1	34.2	55.0	41.6	41.7	58.4	47.3	42.1	52.5	37.2	37.2
Incr Delay (d2), s/veh	249.4	0.6	0.6	81.6	6.9	7.1	149.3	0.4	0.2	670.6	42.6	53.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.3	6.4	6.6	7.5	12.9	12.8	10.1	12.9	6.5	44.4	29.2	27.8
LnGrp Delay(d),s/veh	302.4	34.7	34.7	136.7	48.5	48.8	207.6	47.7	42.3	723.1	79.8	90.6
LnGrp LOS	F	C	C	F	D	D	F	D	D	F	F	F
Approach Vol, veh/h		759			897			1188			1851	
Approach Delay, s/veh		134.9			62.1			70.7			258.4	
Approach LOS		F			E			E			F	

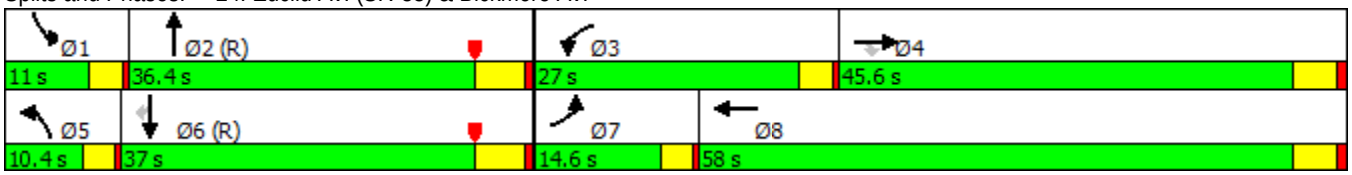
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	46.6	14.0	40.4	14.0	51.6	18.0	36.4
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	29.1	12.0	15.5	12.0	47.6	16.0	27.4
Green Ext Time (p_c), s	0.0	2.2	0.0	5.6	0.0	0.0	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	153.4
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	86	28	52	292	411	79	799	79	690	112
Future Volume (vph)	86	28	52	292	411	79	799	79	690	112
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.8	32.8	32.8	30.1	51.1	7.8	33.6	8.0	33.8	33.8
Actuated g/C Ratio	0.08	0.27	0.27	0.25	0.43	0.06	0.28	0.07	0.28	0.28
v/c Ratio	0.69	0.06	0.11	0.77	0.96	0.80	1.02	0.79	0.76	0.23
Control Delay	79.5	27.4	0.4	58.8	57.1	33.7	48.0	60.7	22.5	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	27.4	0.4	58.8	57.1	33.7	48.0	60.7	22.5	4.9
LOS	E	C	A	E	E	C	D	E	C	A
Approach Delay		45.9			57.6		46.9		23.7	
Approach LOS		D			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 43.5	Intersection LOS: D
Intersection Capacity Utilization 92.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	28	52	292	411	259	79	799	111	79	690	112
Future Volume (veh/h)	86	28	52	292	411	259	79	799	111	79	690	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	91	30	53	311	437	263	84	850	117	84	734	110
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	111	543	461	317	452	272	93	888	122	101	1023	458
Arrive On Green	0.07	0.30	0.30	0.20	0.43	0.43	0.02	0.10	0.10	0.04	0.20	0.20
Sat Flow, veh/h	1619	1800	1528	1619	1054	634	1619	3021	416	1619	3420	1530
Grp Volume(v), veh/h	91	30	53	311	0	700	84	481	486	84	734	110
Grp Sat Flow(s),veh/h/ln	1619	1800	1528	1619	0	1688	1619	1710	1727	1619	1710	1530
Q Serve(g_s), s	6.7	1.4	3.0	22.9	0.0	48.6	6.2	33.6	33.6	6.2	24.1	7.2
Cycle Q Clear(g_c), s	6.7	1.4	3.0	22.9	0.0	48.6	6.2	33.6	33.6	6.2	24.1	7.2
Prop In Lane	1.00		1.00	1.00		0.38	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	111	543	461	317	0	724	93	503	508	101	1023	458
V/C Ratio(X)	0.82	0.06	0.11	0.98	0.00	0.97	0.90	0.96	0.96	0.83	0.72	0.24
Avail Cap(c_a), veh/h	150	609	517	317	0	746	93	503	508	101	1023	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.1	29.7	30.3	48.0	0.0	33.4	58.5	53.4	53.4	56.9	43.2	36.5
Incr Delay (d2), s/veh	16.7	0.0	0.0	45.1	0.0	24.5	10.6	5.6	5.5	5.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.7	1.3	14.2	0.0	27.5	3.1	16.7	16.9	2.9	11.5	3.1
LnGrp Delay(d),s/veh	71.8	29.8	30.3	93.1	0.0	57.9	69.1	59.0	58.9	61.9	43.6	36.6
LnGrp LOS	E	C	C	F		E	E	E	E	E	D	D
Approach Vol, veh/h		174			1011			1051			928	
Approach Delay, s/veh		51.9			68.7			59.8			44.5	
Approach LOS		D			E			E			D	

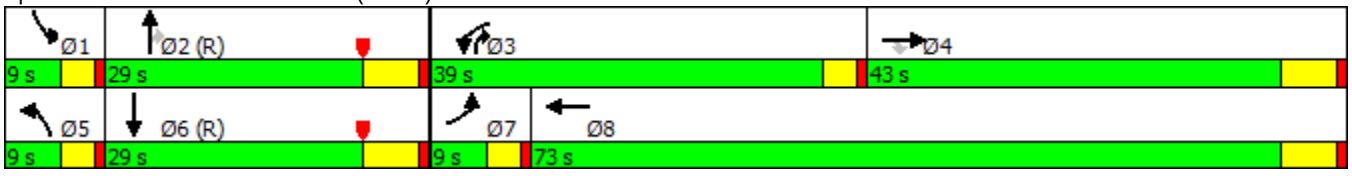
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	40.8	27.0	41.2	10.4	41.4	11.8	56.5
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	8.2	35.6	24.9	5.0	8.2	26.1	8.7	50.6
Green Ext Time (p_c), s	0.0	0.0	0.0	3.4	0.0	3.2	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	57.7
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	223	33	897	169	59	950	506	87	925
Future Volume (vph)	5	223	33	897	169	59	950	506	87	925
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	23.0	23.0	35.0	60.2	8.6	28.9	65.9	13.1	33.4
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.24	0.55	0.11	0.28
v/c Ratio	0.07	0.65	0.08	1.05	0.33	0.52	1.17	0.51	0.50	1.00
Control Delay	57.8	52.6	0.4	87.1	15.2	61.0	128.4	4.3	64.6	54.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.6	0.4	87.1	15.2	61.0	128.4	4.3	64.6	54.5
LOS	E	D	A	F	B	E	F	A	E	D
Approach Delay		46.1			69.8		84.4			55.4
Approach LOS		D			E		F			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 70.1	Intersection LOS: E
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	223	33	897	169	114	59	950	506	87	925	15
Future Volume (veh/h)	5	223	33	897	169	114	59	950	506	87	925	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	225	0	906	171	100	60	960	333	88	934	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	301	255	862	480	281	67	1139	944	67	1154	12
Arrive On Green	0.01	0.17	0.00	0.29	0.45	0.45	0.04	0.33	0.33	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1061	620	1619	3420	1496	1619	3465	37
Grp Volume(v), veh/h	5	225	0	906	0	271	60	960	333	88	461	483
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1681	1619	1710	1496	1619	1710	1793
Q Serve(g_s), s	0.4	14.3	0.0	35.0	0.0	12.6	4.4	31.2	12.9	5.0	31.6	31.6
Cycle Q Clear(g_c), s	0.4	14.3	0.0	35.0	0.0	12.6	4.4	31.2	12.9	5.0	31.6	31.6
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	10	301	255	862	0	760	67	1139	944	67	569	597
V/C Ratio(X)	0.48	0.75	0.00	1.05	0.00	0.36	0.89	0.84	0.35	1.30	0.81	0.81
Avail Cap(c_a), veh/h	67	555	472	862	0	939	67	1139	944	67	569	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.15	0.15	0.15	0.60	0.60	0.60
Uniform Delay (d), s/veh	59.4	47.6	0.0	42.5	0.0	21.5	57.2	37.1	10.9	59.2	49.7	49.7
Incr Delay (d2), s/veh	12.4	5.2	0.0	44.9	0.0	0.4	18.8	1.3	0.2	187.5	7.5	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.6	0.0	19.6	0.0	6.0	2.3	14.9	5.3	5.8	16.2	16.9
LnGrp Delay(d),s/veh	71.8	52.8	0.0	87.4	0.0	21.9	76.0	38.4	11.0	246.7	57.1	56.8
LnGrp LOS	E	D		F		C	E	D	B	F	E	E
Approach Vol, veh/h		230			1177			1353			1032	
Approach Delay, s/veh		53.2			72.3			33.3			73.2	
Approach LOS		D			E			C			E	

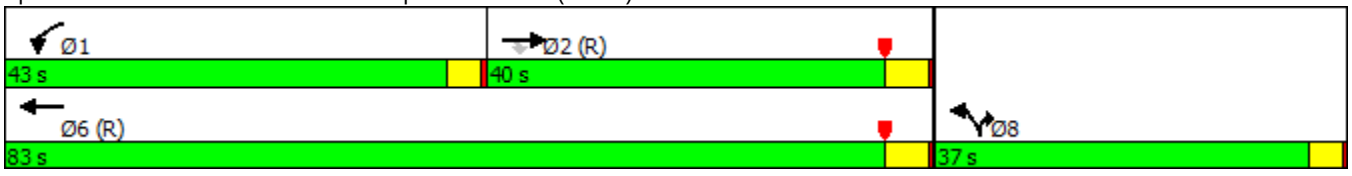
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	46.0	39.0	26.0	9.0	46.0	4.8	60.3
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	7.0	33.2	37.0	16.3	6.4	33.6	2.4	14.6
Green Ext Time (p_c), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	57.5
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	553	306	602	1245	73	998
Future Volume (vph)	553	306	602	1245	73	998
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	40.0	40.0	43.0	83.0	37.0	37.0
Total Split (%)	33.3%	33.3%	35.8%	69.2%	30.8%	30.8%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	35.5	35.5	39.5	78.5	33.5	33.5
Actuated g/C Ratio	0.30	0.30	0.33	0.65	0.28	0.28
v/c Ratio	0.57	0.47	1.12	0.58	0.08	1.20
Control Delay	60.3	25.4	96.7	1.1	32.3	117.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	25.4	96.7	1.1	32.3	117.5
LOS	E	C	F	A	C	F
Approach Delay	47.9			32.2	111.7	
Approach LOS	D			C	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 58.3	Intersection LOS: E
Intersection Capacity Utilization 88.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	553	306	602	1245	73	998
Future Volume (veh/h)	553	306	602	1245	73	998
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	576	0	627	1297	76	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1824	816	564	3050	139	64
Arrive On Green	1.00	0.00	0.33	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	576	0	627	1297	76	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	39.5	7.9	2.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	39.5	7.9	2.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1824	816	564	3050	139	64
V/C Ratio(X)	0.32	0.00	1.11	0.43	0.55	0.00
Avail Cap(c_a), veh/h	1824	816	564	3050	928	427
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	40.3	1.1	56.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	52.7	0.0	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	26.9	3.6	1.3	0.0
LnGrp Delay(d),s/veh	0.5	0.0	93.0	1.2	59.7	0.0
LnGrp LOS	A		F	A	E	
Approach Vol, veh/h	576			1924	76	
Approach Delay, s/veh	0.5			31.1	59.7	
Approach LOS	A			C	E	

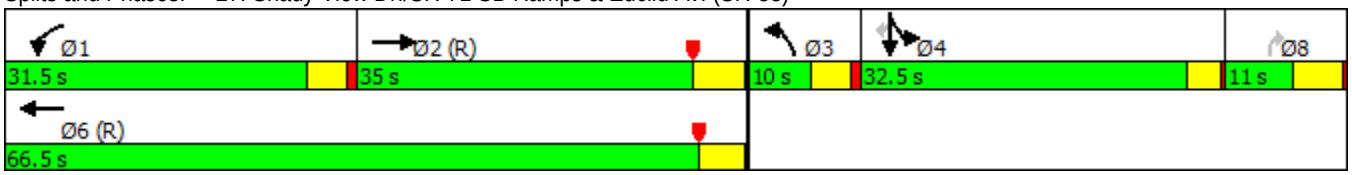
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	43.0	68.5				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	39.5	35.5				78.5		33.5
Max Q Clear Time (g_c+I1), s	41.5	2.0				9.9		4.7
Green Ext Time (p_c), s	0.0	13.6				16.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.1
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	823	404	247	63	306	277	21	37
Future Volume (vph)	823	404	247	63	306	277	21	37
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	35.0	31.5	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	29.2%	26.3%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	30.0	35.7	70.7	5.5	7.4	18.9	18.9	18.9
Actuated g/C Ratio	0.25	0.30	0.59	0.05	0.06	0.16	0.16	0.16
v/c Ratio	1.08	0.93	0.13	0.93	0.82	0.68	0.63	0.11
Control Delay	97.7	67.3	3.6	144.5	22.9	60.8	57.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.7	67.3	3.6	144.5	22.9	60.8	57.2	0.6
LOS	F	E	A	F	C	E	E	A
Approach Delay	97.7		43.1				52.5	
Approach LOS	F		D				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 65.5	Intersection LOS: E
Intersection Capacity Utilization 76.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	823	17	404	247	0	63	0	306	277	21	37
Future Volume (veh/h)	0	823	17	404	247	0	63	0	306	277	21	37
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	904	19	444	271	0	69	0	336	320	0	41
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1866	39	364	2761	0	0	0	0	394	0	186
Arrive On Green	0.00	0.54	0.54	0.38	1.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Sat Flow, veh/h	0	3515	72	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	451	472	444	271	0		0.0		320	0	41
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	19.6	19.6	27.0	0.0	0.0				11.6	0.0	2.9
Cycle Q Clear(g_c), s	0.0	19.6	19.6	27.0	0.0	0.0				11.6	0.0	2.9
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	932	974	364	2761	0				394	0	186
V/C Ratio(X)	0.00	0.48	0.48	1.22	0.10	0.00				0.81	0.00	0.22
Avail Cap(c_a), veh/h	0	932	974	364	2761	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.9	16.9	37.5	0.0	0.0				51.4	0.0	47.6
Incr Delay (d2), s/veh	0.0	1.8	1.7	120.9	0.1	0.0				4.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.6	10.0	24.2	0.0	0.0				5.4	0.0	1.3
LnGrp Delay(d),s/veh	0.0	18.7	18.6	158.3	0.1	0.0				55.4	0.0	48.1
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		923			715						361	
Approach Delay, s/veh		18.6			98.4						54.6	
Approach LOS		B			F						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	31.5	70.4		18.1		101.9		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	27.0	30.0		29.0		* 62		
Max Q Clear Time (g_c+I1), s	29.0	21.6		13.6		2.0		
Green Ext Time (p_c), s	0.0	3.2		1.1		5.1		

Intersection Summary	
HCM 2010 Ctrl Delay	53.6
HCM 2010 LOS	D

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	947	189	13	984	37	3
Future Volume (vph)	947	189	13	984	37	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	56.3	56.3	5.3	57.6	13.0	13.0
Actuated g/C Ratio	0.68	0.68	0.06	0.70	0.16	0.16
v/c Ratio	0.84	0.19	0.13	0.85	0.16	0.01
Control Delay	19.3	1.7	50.5	18.2	36.6	24.7
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	19.3	1.7	50.5	18.2	36.6	24.7
LOS	B	A	D	B	D	C
Approach Delay	16.4			18.6	35.8	
Approach LOS	B			B	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 82.7	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 72.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	947	189	13	984	37	3
Future Volume (veh/h)	947	189	13	984	37	3
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1029	205	14	1070	40	3
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1241	1055	27	1365	184	174
Arrive On Green	0.69	0.69	0.02	0.76	0.11	0.11
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1029	205	14	1070	40	3
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	36.5	4.2	0.8	31.2	2.0	0.2
Cycle Q Clear(g_c), s	36.5	4.2	0.8	31.2	2.0	0.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1241	1055	27	1365	184	174
V/C Ratio(X)	0.83	0.19	0.53	0.78	0.22	0.02
Avail Cap(c_a), veh/h	1473	1252	92	1669	496	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.9	4.9	43.0	6.3	35.5	34.7
Incr Delay (d2), s/veh	3.5	0.1	5.8	2.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.9	1.8	0.4	15.9	0.9	0.1
LnGrp Delay(d),s/veh	13.5	5.0	48.8	8.4	36.1	34.7
LnGrp LOS	B	A	D	A	D	C
Approach Vol, veh/h	1234			1084	43	
Approach Delay, s/veh	12.0			8.9	36.0	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.1	67.0				73.0		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.8	38.5				33.2		4.0
Green Ext Time (p_c), s	0.0	22.3				27.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	7	0	39	186	16
Future Vol, veh/h	0	7	0	39	186	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	8	0	42	202	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	211	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	834	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	834	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	834	-	-
HCM Lane V/C Ratio	-	0.009	-	-
HCM Control Delay (s)	-	9.4	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	5	34	5	26	167
Future Vol, veh/h	1	5	34	5	26	167
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	5	37	5	28	182

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	278	40	0	0	42	0
Stage 1	40	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	716	1037	-	-	1580	-
Stage 1	988	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	702	1037	-	-	1580	-
Mov Cap-2 Maneuver	702	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	790	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	961	1580	-
HCM Lane V/C Ratio	-	-	0.007	0.018	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	1	3	36	150	18
Future Vol, veh/h	4	1	3	36	150	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	1	3	39	163	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	219	173	183	0	-	0
Stage 1	173	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	774	876	1404	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	772	876	1404	-	-	-
Mov Cap-2 Maneuver	762	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	980	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1404	-	782	-	-
HCM Lane V/C Ratio	0.002	-	0.007	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	2	37	5	8	143
Future Vol, veh/h	1	2	37	5	8	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	2	40	5	9	155

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	216	43	0	0	46	0
Stage 1	43	-	-	-	-	-
Stage 2	173	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	777	1033	-	-	1575	-
Stage 1	985	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	772	1033	-	-	1575	-
Mov Cap-2 Maneuver	760	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	923	1575	-
HCM Lane V/C Ratio	-	-	0.004	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	1	39	32	97	46
Future Vol, veh/h	11	1	39	32	97	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	1	42	35	105	50

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	250	130	155	0	-	0
Stage 1	130	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	743	925	1438	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	721	925	1438	-	-	-
Mov Cap-2 Maneuver	736	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	4.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1438	-	749	-	-
HCM Lane V/C Ratio	0.029	-	0.017	-	-
HCM Control Delay (s)	7.6	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	4	21	64	70	28
Future Vol, veh/h	7	4	21	64	70	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	4	23	70	76	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	206	91	107	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	787	972	1497	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	774	972	1497	-	-	-
Mov Cap-2 Maneuver	772	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	900	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1497	-	834	-	-
HCM Lane V/C Ratio	0.015	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	3	13	76	31	43
Future Vol, veh/h	8	3	13	76	31	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	3	14	83	34	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	168	57	80	0	-	0
Stage 1	57	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	827	1015	1531	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	819	1015	1531	-	-	-
Mov Cap-2 Maneuver	800	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1531	-	849	-	-
HCM Lane V/C Ratio	0.009	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	2	8	86	17	17
Future Vol, veh/h	3	2	8	86	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	2	9	93	18	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	139	28	37	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	859	1053	1587	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	854	1053	1587	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	913	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1587	-	898	-	-
HCM Lane V/C Ratio	0.005	-	0.006	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	79	142	808	16	3	16
Future Vol, veh/h	79	142	808	16	3	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	86	154	878	17	3	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	878	0	-	0	1204	878
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	326	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	778	-	-	-	205	350
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	736	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	778	-	-	-	182	350
Mov Cap-2 Maneuver	-	-	-	-	360	-
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	655	-

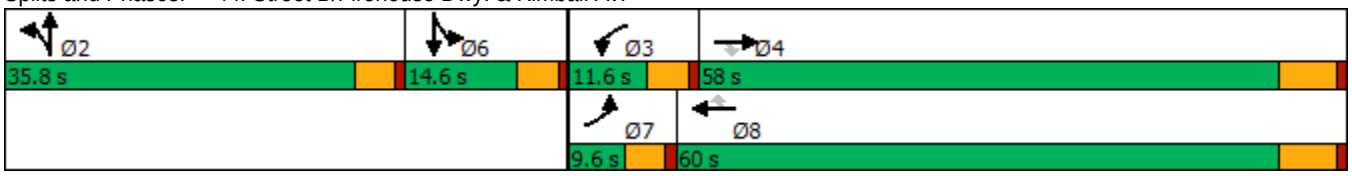
Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	778	-	-	-	360	350
HCM Lane V/C Ratio	0.11	-	-	-	0.009	0.05
HCM Control Delay (s)	10.2	-	-	-	15.1	15.8
HCM Lane LOS	B	-	-	-	C	C
HCM 95th %tile Q(veh)	0.4	-	-	-	0	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	3	964	93	34	1387	0	0
Future Volume (vph)	3	964	93	34	1387	0	0
Turn Type	Prot	NA	Perm	Prot	NA	NA	NA
Protected Phases	7	4		3	8	2	6
Permitted Phases			4				
Detector Phase	7	4	4	3	8	2	6
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	24.2	9.6	16.2	31.6	14.6
Total Split (s)	9.6	58.0	58.0	11.6	60.0	35.8	14.6
Total Split (%)	8.0%	48.3%	48.3%	9.7%	50.0%	29.8%	12.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	Min
Act Effct Green (s)	5.1	49.3	49.3	6.2	54.4	12.9	10.1
Actuated g/C Ratio	0.05	0.52	0.52	0.07	0.58	0.14	0.11
v/c Ratio	0.03	0.56	0.10	0.33	1.47	0.08	0.01
Control Delay	48.0	18.6	4.1	53.2	239.9	0.5	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	18.6	4.1	53.2	239.9	0.5	43.0
LOS	D	B	A	D	F	A	D
Approach Delay		17.4			235.5	0.5	43.0
Approach LOS		B			F	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.47	
Intersection Signal Delay: 140.8	Intersection LOS: F
Intersection Capacity Utilization 94.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	964	93	34	1387	0	18	0	7	1	0	0
Future Volume (veh/h)	3	964	93	34	1387	0	18	0	7	1	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	3	1059	53	37	1524	0	20	0	8	1	0	0
Adj No. of Lanes	1	2	1	1	1	1	0	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	6	1952	830	53	1028	874	126	0	50	182	0	0
Arrive On Green	0.00	0.54	0.54	0.03	0.57	0.00	0.11	0.00	0.11	0.11	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	1800	1530	1184	0	473	1714	0	0
Grp Volume(v), veh/h	3	1059	53	37	1524	0	28	0	0	1	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1657	0	0	1714	0	0
Q Serve(g_s), s	0.2	18.0	1.5	2.1	53.8	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	18.0	1.5	2.1	53.8	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.71		0.29	1.00		0.00
Lane Grp Cap(c), veh/h	6	1952	830	53	1028	874	176	0	0	182	0	0
V/C Ratio(X)	0.46	0.54	0.06	0.69	1.48	0.00	0.16	0.00	0.00	0.01	0.00	0.00
Avail Cap(c_a), veh/h	86	1980	842	120	1028	874	549	0	0	182	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.8	14.0	10.2	45.1	20.2	0.0	38.3	0.0	0.0	37.6	0.0	0.0
Incr Delay (d2), s/veh	17.8	0.3	0.0	5.9	222.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.9	0.7	1.0	89.7	0.0	0.7	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	64.6	14.3	10.2	51.0	242.4	0.0	38.7	0.0	0.0	37.7	0.0	0.0
LnGrp LOS	E	B	B	D	F		D			D		
Approach Vol, veh/h		1115			1561			28			1	
Approach Delay, s/veh		14.2			237.8			38.7			37.7	
Approach LOS		B			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.6	7.7	57.3		14.6	5.0	60.0
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		31.2	7.0	51.8		10.0	5.0	53.8
Max Q Clear Time (g_c+I1), s		3.4	4.1	20.0		2.0	2.2	55.8
Green Ext Time (p_c), s		0.1	0.0	8.1		0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	143.5
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	17	10	0	83	49
Future Vol, veh/h	0	17	10	0	83	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	18	11	0	90	53

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	245	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	234	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	748	1076	-	-	1621	-
Stage 1	1017	-	-	-	-	-
Stage 2	810	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	705	1076	-	-	1621	-
Mov Cap-2 Maneuver	705	-	-	-	-	-
Stage 1	1017	-	-	-	-	-
Stage 2	764	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1076	1621	-
HCM Lane V/C Ratio	-	-	0.017	0.056	-
HCM Control Delay (s)	-	-	8.4	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	837	36	21	986	61	47
Future Vol, veh/h	837	36	21	986	61	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	872	38	22	1027	64	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	909	0	1962	455
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	1071	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	757	-	~ 63	558
Stage 1	-	-	-	-	366	-
Stage 2	-	-	-	-	332	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	757	-	~ 61	558
Mov Cap-2 Maneuver	-	-	-	-	236	-
Stage 1	-	-	-	-	366	-
Stage 2	-	-	-	-	322	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	19.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	236	558	-	-	757	-
HCM Lane V/C Ratio	0.269	0.088	-	-	0.029	-
HCM Control Delay (s)	25.8	12.1	-	-	9.9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.1	0.3	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	819	33	841	167	39
Future Volume (vph)	819	33	841	167	39
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	27.9	5.1	31.2	10.2	10.2
Actuated g/C Ratio	0.53	0.10	0.59	0.19	0.19
v/c Ratio	0.54	0.23	0.87	0.59	0.13
Control Delay	10.2	29.1	19.6	32.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	29.1	19.6	32.5	9.3
LOS	B	C	B	C	A
Approach Delay	10.2		19.9	28.1	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	819	65	33	841	167	39
Future Volume (veh/h)	819	65	33	841	167	39
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	900	71	36	924	184	40
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1580	125	62	1106	293	277
Arrive On Green	0.49	0.49	0.04	0.61	0.18	0.18
Sat Flow, veh/h	3296	253	1619	1800	1619	1530
Grp Volume(v), veh/h	480	491	36	924	184	40
Grp Sat Flow(s),veh/h/ln	1710	1749	1619	1800	1619	1530
Q Serve(g_s), s	10.9	10.9	1.2	22.5	5.8	1.2
Cycle Q Clear(g_c), s	10.9	10.9	1.2	22.5	5.8	1.2
Prop In Lane		0.14	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	843	862	62	1106	293	277
V/C Ratio(X)	0.57	0.57	0.58	0.84	0.63	0.14
Avail Cap(c_a), veh/h	900	921	146	1260	293	277
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.9	9.9	26.1	8.4	20.9	19.0
Incr Delay (d2), s/veh	0.8	0.7	3.1	4.5	9.8	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.4	0.6	12.2	3.4	0.6
LnGrp Delay(d),s/veh	10.6	10.6	29.3	13.0	30.7	20.1
LnGrp LOS	B	B	C	B	C	C
Approach Vol, veh/h	971			960	224	
Approach Delay, s/veh	10.6			13.6	28.8	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.7	33.4				40.2		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	3.2	12.9				24.5		7.8
Green Ext Time (p_c), s	0.0	10.4				9.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	745	71	641	233	81
Future Volume (vph)	745	71	641	233	81
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	22.0	5.4	29.4	13.8	13.8
Actuated g/C Ratio	0.41	0.10	0.54	0.25	0.25
v/c Ratio	0.74	0.50	0.74	0.64	0.23
Control Delay	17.9	38.7	14.3	30.3	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	38.7	14.3	30.3	17.9
LOS	B	D	B	C	B
Approach Delay	17.9		16.7	27.1	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 54.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 19.0	Intersection LOS: B
Intersection Capacity Utilization 59.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	745	140	71	641	233	81
Future Volume (veh/h)	745	140	71	641	233	81
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	837	157	80	720	262	73
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1166	219	104	1001	398	376
Arrive On Green	0.41	0.41	0.06	0.56	0.25	0.25
Sat Flow, veh/h	2951	537	1619	1800	1619	1530
Grp Volume(v), veh/h	500	494	80	720	262	73
Grp Sat Flow(s),veh/h/ln	1710	1688	1619	1800	1619	1530
Q Serve(g_s), s	13.4	13.4	2.7	16.1	7.9	2.1
Cycle Q Clear(g_c), s	13.4	13.4	2.7	16.1	7.9	2.1
Prop In Lane		0.32	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	697	688	104	1001	398	376
V/C Ratio(X)	0.72	0.72	0.77	0.72	0.66	0.19
Avail Cap(c_a), veh/h	809	799	160	1182	398	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	13.5	25.1	9.0	18.5	16.3
Incr Delay (d2), s/veh	2.6	2.6	4.4	1.8	8.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	6.7	1.3	8.3	4.4	1.0
LnGrp Delay(d),s/veh	16.1	16.2	29.5	10.7	26.8	17.4
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	994			800	335	
Approach Delay, s/veh	16.1			12.6	24.7	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.1	28.4				36.5		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.7	15.4				18.1		9.9
Green Ext Time (p_c), s	0.0	6.8				9.7		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	84.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	402	413	11	5	480	124	19	20	18	96	13	213
Future Vol, veh/h	402	413	11	5	480	124	19	20	18	96	13	213
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	423	435	12	5	505	131	20	21	19	101	14	224

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	637	0	0	448	0	0	1989	1936	226	1657	1877	572
Stage 1	-	-	-	-	-	-	1289	1289	-	582	582	-
Stage 2	-	-	-	-	-	-	700	647	-	1075	1295	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	956	-	-	1123	-	-	41	66	783	~ 72	72	523
Stage 1	-	-	-	-	-	-	176	236	-	502	502	-
Stage 2	-	-	-	-	-	-	433	470	-	238	235	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	956	-	-	1122	-	-	~ 14	37	781	~ 28	40	523
Mov Cap-2 Maneuver	-	-	-	-	-	-	146	40	-	~ 79	103	-
Stage 1	-	-	-	-	-	-	98	131	-	280	499	-
Stage 2	-	-	-	-	-	-	240	467	-	109	131	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.7	0.1	109.7	$ 442.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	87	956	-	-	1122	-	-	184
HCM Lane V/C Ratio	0.69	0.443	-	-	0.005	-	-	1.842
HCM Control Delay (s)	109.7	11.7	-	-	8.2	-	-	$ 442.3
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	3.3	2.3	-	-	0	-	-	24.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	402	16	25	531	8	61	0	22	2	0	16
Future Vol, veh/h	109	402	16	25	531	8	61	0	22	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	442	18	27	584	9	67	0	24	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	592	0	0	460	0	0	1341	1336	231	1101	1340	588
Stage 1	-	-	-	-	-	-	689	689	-	643	643	-
Stage 2	-	-	-	-	-	-	652	647	-	458	697	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	994	-	-	1112	-	-	121	155	777	180	154	513
Stage 1	-	-	-	-	-	-	407	450	-	465	472	-
Stage 2	-	-	-	-	-	-	460	470	-	557	446	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	994	-	-	1112	-	-	104	133	776	156	132	513
Mov Cap-2 Maneuver	-	-	-	-	-	-	245	273	-	156	132	-
Stage 1	-	-	-	-	-	-	358	396	-	410	461	-
Stage 2	-	-	-	-	-	-	434	459	-	476	393	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.4	22.2	14.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	299	994	-	-	1112	-	-	409
HCM Lane V/C Ratio	0.305	0.119	-	-	0.025	-	-	0.048
HCM Control Delay (s)	22.2	9.1	-	-	8.3	-	-	14.2
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.3	0.4	-	-	0.1	-	-	0.1

Intersection	
Intersection Delay, s/veh	28.7
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	230	0	197	0	0	0	0	0	306	465	0
Future Vol, veh/h	0	230	0	197	0	0	0	0	0	306	465	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	247	0	212	0	0	0	0	0	329	500	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	17.6	41.4
HCM LOS	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	306	465	230	197	120	255
LT Vol	306	0	230	0	0	0
Through Vol	0	465	0	0	120	0
RT Vol	0	0	0	197	0	255
Lane Flow Rate	329	500	247	212	129	274
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.67	0.948	0.557	0.405	0.268	0.514
Departure Headway (Hd)	7.335	6.823	8.107	6.881	7.472	6.752
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	494	535	448	525	481	535
Service Time	5.054	4.543	5.825	4.599	5.21	4.49
HCM Lane V/C Ratio	0.666	0.935	0.551	0.404	0.268	0.512
HCM Control Delay	23.7	53.1	20.6	14.2	12.9	16.4
HCM Lane LOS	C	F	C	B	B	C
HCM 95th-tile Q	4.9	12.1	3.3	1.9	1.1	2.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

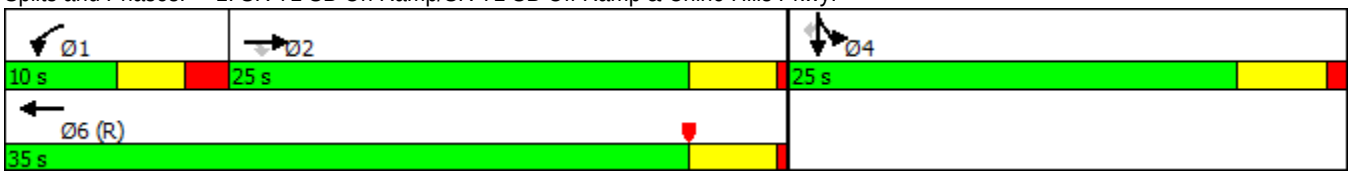
Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	120	255
Future Vol, veh/h	0	0	120	255
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	129	274
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	15.3
HCM LOS	C

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1183	701	18	979	432	240	707
Future Volume (vph)	1183	701	18	979	432	240	707
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.42	0.76	0.14	0.59	0.68	0.65	1.27
Control Delay	11.6	12.2	37.7	9.5	25.5	23.4	153.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	12.2	37.7	9.5	25.5	23.4	153.3
LOS	B	B	D	A	C	C	F
Approach Delay	11.8			10.0		90.4	
Approach LOS	B			A		F	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 36.8	Intersection LOS: D
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1183	701	18	979	0	0	0	0	432	240	707
Future Volume (veh/h)	0	1183	701	18	979	0	0	0	0	432	240	707
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1245	612	19	1031	0				354	394	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2492	607	37	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.05	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1245	612	19	1031	0				354	394	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	9.0	24.1	0.7	0.0	0.0				11.2	11.2	0.0
Cycle Q Clear(g_c), s	0.0	9.0	24.1	0.7	0.0	0.0				11.2	11.2	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2492	607	37	1739	0				540	600	510
V/C Ratio(X)	0.00	0.50	1.01	0.52	0.59	0.00				0.66	0.66	0.00
Avail Cap(c_a), veh/h	0	2492	607	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.76	0.76	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.4	17.9	28.3	0.0	0.0				17.1	17.1	0.0
Incr Delay (d2), s/veh	0.0	0.2	38.7	3.2	1.1	0.0				6.1	5.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	16.5	0.3	0.3	0.0				5.8	6.4	0.0
LnGrp Delay(d),s/veh	0.0	13.6	56.7	31.5	1.1	0.0				23.2	22.6	0.0
LnGrp LOS		B	F	C	A					C	C	
Approach Vol, veh/h		1857			1050						748	
Approach Delay, s/veh		27.8			1.7						22.9	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.4	28.6		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	26.1		13.2		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.6		22.0		

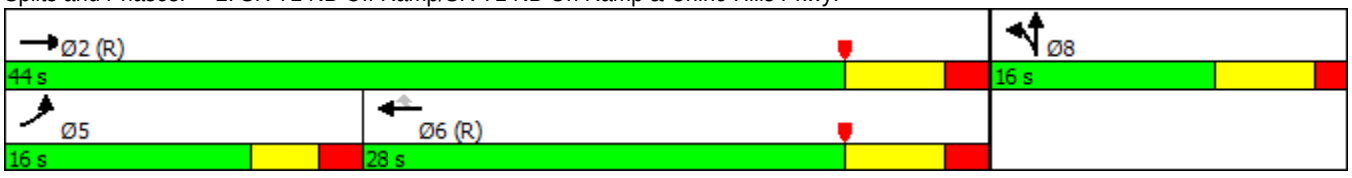
Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	419	1197	639	619	359	108
Future Volume (vph)	419	1197	639	619	359	108
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	37.5	21.5	21.5	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.84	0.60	0.56	0.97	0.79	0.59
Control Delay	39.0	9.5	17.6	42.7	49.7	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	9.5	17.6	42.7	49.7	28.2
LOS	D	A	B	D	D	C
Approach Delay		17.2	30.0			36.4
Approach LOS		B	C			D

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 24.7	Intersection LOS: C
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	419	1197	0	0	639	619	359	108	5	0	0	0
Future Volume (veh/h)	419	1197	0	0	639	619	359	108	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	451	1287	0	0	687	663	386	116	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	536	2138	0	0	1233	544	540	297	3			
Arrive On Green	0.18	0.63	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1782	15			
Grp Volume(v), veh/h	451	1287	0	0	687	663	386	0	117			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	8.8	13.6	0.0	0.0	9.6	21.6	6.8	0.0	3.5			
Cycle Q Clear(g_c), s	8.8	13.6	0.0	0.0	9.6	21.6	6.8	0.0	3.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	536	2138	0	0	1233	544	540	0	300			
V/C Ratio(X)	0.84	0.60	0.00	0.00	0.56	1.22	0.72	0.00	0.39			
Avail Cap(c_a), veh/h	542	2138	0	0	1233	544	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.46	0.46	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.7	6.8	0.0	0.0	15.4	19.2	23.7	0.0	22.3			
Incr Delay (d2), s/veh	10.1	1.1	0.0	0.0	0.8	106.6	7.9	0.0	3.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.3	6.6	0.0	0.0	4.6	25.0	3.6	0.0	2.0			
LnGrp Delay(d),s/veh	33.8	7.9	0.0	0.0	16.2	125.8	31.5	0.0	26.1			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1738			1350			503				
Approach Delay, s/veh		14.6			70.0			30.3				
Approach LOS		B			E			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			15.9	28.1		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		15.6			10.8	23.6		8.8
Green Ext Time (p_c), s		16.7			0.0	0.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D

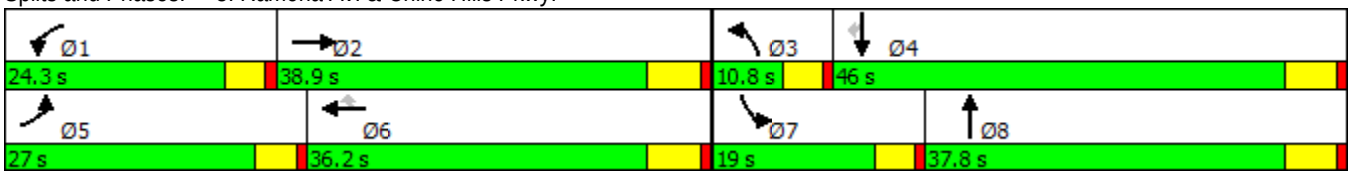
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	261	939	145	811	141	22	301	164	472	424
Future Volume (vph)	261	939	145	811	141	22	301	164	472	424
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	21.8	37.0	15.2	30.4	30.4	5.7	32.0	14.1	44.3	44.3
Actuated g/C Ratio	0.18	0.31	0.13	0.26	0.26	0.05	0.27	0.12	0.37	0.37
v/c Ratio	0.94	0.66	0.75	0.99	0.30	0.30	0.51	0.92	0.39	0.53
Control Delay	88.2	38.7	71.7	72.5	7.2	65.1	34.1	98.5	29.8	5.2
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.2	39.1	71.7	72.5	7.2	65.1	34.1	98.5	29.8	5.2
LOS	F	D	E	E	A	E	C	F	C	A
Approach Delay		49.7		64.0			35.6		30.6	
Approach LOS		D		E			D		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 119.1
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 46.8 — Intersection LOS: D
Intersection Capacity Utilization 94.0% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	939	2	145	811	141	22	301	142	164	472	424
Future Volume (veh/h)	261	939	2	145	811	141	22	301	142	164	472	424
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	278	999	2	154	863	105	23	320	96	174	502	341
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	300	1666	3	179	868	383	36	693	204	195	1248	550
Arrive On Green	0.19	0.33	0.33	0.11	0.25	0.25	0.02	0.27	0.27	0.12	0.36	0.36
Sat Flow, veh/h	1619	5064	10	1619	3420	1509	1619	2596	765	1619	3420	1507
Grp Volume(v), veh/h	278	646	355	154	863	105	23	209	207	174	502	341
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1651	1619	1710	1507
Q Serve(g_s), s	20.2	19.8	19.8	11.2	30.2	6.7	1.7	12.2	12.6	12.7	13.1	22.3
Cycle Q Clear(g_c), s	20.2	19.8	19.8	11.2	30.2	6.7	1.7	12.2	12.6	12.7	13.1	22.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	300	1077	591	179	868	383	36	457	441	195	1248	550
V/C Ratio(X)	0.93	0.60	0.60	0.86	0.99	0.27	0.64	0.46	0.47	0.89	0.40	0.62
Avail Cap(c_a), veh/h	303	1077	591	266	868	383	84	457	441	195	1248	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	33.6	33.6	52.4	44.6	35.9	58.1	36.7	36.8	52.0	28.3	31.2
Incr Delay (d2), s/veh	32.2	1.1	2.0	11.9	29.2	0.5	6.7	3.3	3.6	35.9	1.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	9.1	10.2	5.6	17.7	2.8	0.8	6.2	6.2	7.6	6.4	10.0
LnGrp Delay(d),s/veh	80.2	34.7	35.6	64.3	73.8	36.4	64.8	39.9	40.4	87.9	29.3	36.4
LnGrp LOS	F	C	D	E	E	D	E	D	D	F	C	D
Approach Vol, veh/h		1279			1122			439			1017	
Approach Delay, s/veh		44.9			69.0			41.5			41.7	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	45.2	7.3	49.5	26.8	36.2	19.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	13.2	21.8	3.7	24.3	22.2	32.2	14.7	14.6
Green Ext Time (p_c), s	0.1	9.4	0.0	6.0	0.0	0.0	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	50.7
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	930	127	47	924	92	29
Future Vol, veh/h	930	127	47	924	92	29
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1033	141	52	1027	102	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1036	0	1654	520
Stage 1	-	-	-	-	1036	-
Stage 2	-	-	-	-	618	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	679	-	~ 91	506
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	506	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	679	-	~ 84	505
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	467	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	28
HCM LOS			D

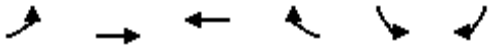
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	288	-	-	679	-
HCM Lane V/C Ratio	0.467	-	-	0.077	-
HCM Control Delay (s)	28	-	-	10.7	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.3	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	126	833	725	62	246
Future Volume (vph)	126	833	725	62	246
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	11.6	45.1	28.8	23.6	36.4
Actuated g/C Ratio	0.14	0.56	0.36	0.29	0.45
v/c Ratio	0.59	0.47	0.71	0.08	0.36
Control Delay	44.5	11.0	25.5	24.8	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	11.0	25.5	24.8	9.7
LOS	D	B	C	C	A
Approach Delay		15.4	25.5	12.7	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 80.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 61.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	126	833	725	64	62	246
Future Volume (veh/h)	126	833	725	64	62	246
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	137	905	788	68	67	81
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	168	2044	1402	121	793	569
Arrive On Green	0.10	0.60	0.44	0.44	0.27	0.27
Sat Flow, veh/h	1619	3510	3270	274	2956	1530
Grp Volume(v), veh/h	137	905	424	432	67	81
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1744	1478	1530
Q Serve(g_s), s	7.2	12.5	15.9	15.9	1.5	3.0
Cycle Q Clear(g_c), s	7.2	12.5	15.9	15.9	1.5	3.0
Prop In Lane	1.00			0.16	1.00	1.00
Lane Grp Cap(c), veh/h	168	2044	754	769	793	569
V/C Ratio(X)	0.82	0.44	0.56	0.56	0.08	0.14
Avail Cap(c_a), veh/h	532	3369	1032	1053	793	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	9.5	18.0	18.0	23.7	18.0
Incr Delay (d2), s/veh	3.7	0.2	0.9	0.9	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	5.8	7.7	7.9	0.6	3.2
LnGrp Delay(d),s/veh	41.6	9.7	18.9	18.9	23.9	18.5
LnGrp LOS	D	A	B	B	C	B
Approach Vol, veh/h		1042	856		148	
Approach Delay, s/veh		13.9	18.9		21.0	
Approach LOS		B	B		C	

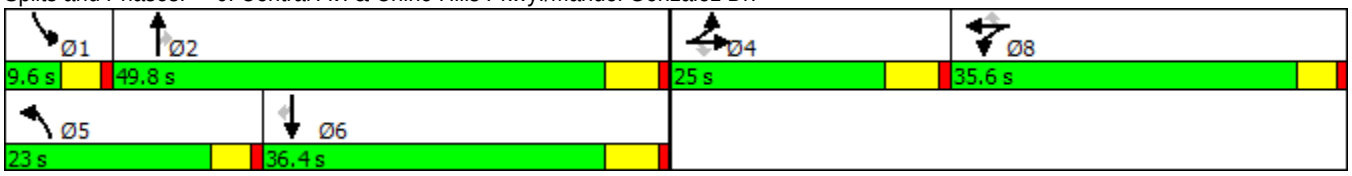
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		57.5		29.0	13.6	43.9		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		14.5		5.0	9.2	17.9		
Green Ext Time (p_c), s		28.2		0.4	0.1	20.2		

Intersection Summary	
HCM 2010 Ctrl Delay	16.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	504	2	430	12	42	34	361	770	1	11	862	236
Future Volume (vph)	504	2	430	12	42	34	361	770	1	11	862	236
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.92	0.87	0.69	0.06	0.19	0.11	1.31	0.47	0.00	0.15	0.89	0.45
Control Delay	78.4	69.0	10.1	37.7	40.3	0.6	195.7	18.9	0.0	54.5	45.9	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	69.0	10.1	37.7	40.3	0.6	195.7	18.9	0.0	54.5	45.9	16.0
LOS	E	E	B	D	D	A	F	B	A	D	D	B
Approach Delay		44.5			24.7			75.2			39.6	
Approach LOS		D			C			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 52.9	Intersection LOS: D
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	504	2	430	12	42	34	361	770	1	11	862	236
Future Volume (veh/h)	504	2	430	12	42	34	361	770	1	11	862	236
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	549	0	339	13	46	20	392	837	1	12	937	187
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	631	0	298	156	173	146	303	1653	739	23	1063	469
Arrive On Green	0.20	0.00	0.20	0.10	0.10	0.10	0.19	0.48	0.48	0.01	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	549	0	339	13	46	20	392	837	1	12	937	187
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	16.2	0.0	19.2	0.7	2.3	1.2	18.4	16.5	0.0	0.7	25.6	9.6
Cycle Q Clear(g_c), s	16.2	0.0	19.2	0.7	2.3	1.2	18.4	16.5	0.0	0.7	25.6	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	631	0	298	156	173	146	303	1653	739	23	1063	469
V/C Ratio(X)	0.87	0.00	1.14	0.08	0.27	0.14	1.30	0.51	0.00	0.52	0.88	0.40
Avail Cap(c_a), veh/h	631	0	298	510	567	479	303	1653	739	82	1063	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	0.0	39.6	40.6	41.3	40.8	40.0	17.4	13.1	48.2	32.2	26.7
Incr Delay (d2), s/veh	12.5	0.0	94.1	0.2	0.8	0.4	155.3	1.1	0.0	6.6	10.5	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	15.9	0.3	1.2	0.5	21.2	8.0	0.0	0.4	13.7	4.3
LnGrp Delay(d),s/veh	50.9	0.0	133.7	40.8	42.1	41.2	195.4	18.5	13.1	54.8	42.7	29.2
LnGrp LOS	D		F	D	D	D	F	B	B	D	D	C
Approach Vol, veh/h		888			79			1230			1136	
Approach Delay, s/veh		82.5			41.6			74.9			40.6	
Approach LOS		F			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	53.4		25.0	23.0	36.4		14.1
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	18.5		21.2	20.4	27.6		4.3
Green Ext Time (p_c), s	0.0	18.3		0.0	0.0	2.7		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	64.4
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	27	5	791	4	513	9	583	847	589	723
Future Volume (vph)	27	5	791	4	513	9	583	847	589	723
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	28.1	28.1	71.5	5.0	23.8	23.8	37.6	64.1
Actuated g/C Ratio	0.09	0.09	0.24	0.24	0.61	0.04	0.20	0.20	0.32	0.55
v/c Ratio	0.20	0.17	1.12	1.06	0.52	0.13	0.87	1.11	1.19	0.29
Control Delay	55.2	26.0	126.3	107.4	9.6	59.8	60.7	82.5	138.2	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	26.0	126.3	107.4	9.6	59.8	60.7	82.5	138.2	15.5
LOS	E	C	F	F	A	E	E	F	F	B
Approach Delay		40.9		74.8			73.5			69.9
Approach LOS		D		E			E			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.1	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 72.3	Intersection LOS: E
Intersection Capacity Utilization 112.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	5	21	791	4	513	9	583	847	589	723	18
Future Volume (veh/h)	27	5	21	791	4	513	9	583	847	589	723	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	28	5	13	827	0	383	9	607	706	614	753	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	107	29	76	770	0	851	18	688	303	515	2522	50
Arrive On Green	0.07	0.07	0.07	0.24	0.00	0.24	0.01	0.20	0.20	0.32	0.51	0.51
Sat Flow, veh/h	1619	443	1153	3238	0	1530	1619	3420	1508	1619	4958	99
Grp Volume(v), veh/h	28	0	18	827	0	383	9	607	706	614	497	271
Grp Sat Flow(s),veh/h/ln	1619	0	1597	1619	0	1530	1619	1710	1508	1619	1638	1780
Q Serve(g_s), s	1.9	0.0	1.3	28.0	0.0	17.5	0.7	20.3	23.7	37.5	10.4	10.4
Cycle Q Clear(g_c), s	1.9	0.0	1.3	28.0	0.0	17.5	0.7	20.3	23.7	37.5	10.4	10.4
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	107	0	105	770	0	851	18	688	303	515	1667	906
V/C Ratio(X)	0.26	0.00	0.17	1.07	0.00	0.45	0.51	0.88	2.33	1.19	0.30	0.30
Avail Cap(c_a), veh/h	137	0	136	770	0	851	69	688	303	515	1667	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	0.0	52.0	44.9	0.0	15.5	57.9	45.7	47.0	40.1	16.8	16.8
Incr Delay (d2), s/veh	0.5	0.0	0.3	54.3	0.0	0.4	8.4	15.2	607.4	104.0	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.6	18.2	0.0	7.5	0.3	11.1	61.0	31.5	4.8	5.3
LnGrp Delay(d),s/veh	52.7	0.0	52.2	99.2	0.0	15.9	66.3	60.9	654.4	144.1	17.2	17.6
LnGrp LOS	D		D	F		B	E	E	F	F	B	B
Approach Vol, veh/h		46			1210			1322			1382	
Approach Delay, s/veh		52.5			72.8			377.9			73.7	
Approach LOS		D			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.4	5.9	65.7		33.8
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.5	25.7		3.9	2.7	12.4		30.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	25.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	174.7
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1322	916	161
Future Volume (vph)	1322	916	161
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	85.3	85.3	25.2
Actuated g/C Ratio	0.71	0.71	0.21
v/c Ratio	0.53	0.28	1.06dr
Control Delay	5.6	6.9	52.3
Queue Delay	0.0	0.0	0.0
Total Delay	5.6	6.9	52.3
LOS	A	A	D
Approach Delay	5.6	6.9	52.3
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1322	389	0	916	161	348
Future Volume (veh/h)	1322	389	0	916	161	348
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1392	409	0	964	169	205
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2903	849	0	3777	246	233
Arrive On Green	1.00	1.00	0.00	0.77	0.15	0.15
Sat Flow, veh/h	3939	1104	0	5238	1619	1530
Grp Volume(v), veh/h	1206	595	0	964	169	205
Grp Sat Flow(s),veh/h/ln	1638	1605	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	6.8	11.9	15.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.8	11.9	15.7
Prop In Lane		0.69	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2518	1234	0	3777	246	233
V/C Ratio(X)	0.48	0.48	0.00	0.26	0.69	0.88
Avail Cap(c_a), veh/h	2518	1234	0	3777	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.0	48.1	49.8
Incr Delay (d2), s/veh	0.7	1.3	0.0	0.2	1.3	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.0	3.1	5.4	6.9
LnGrp Delay(d),s/veh	0.7	1.3	0.0	4.2	49.4	54.0
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1801			964	374	
Approach Delay, s/veh	0.9			4.2	51.9	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		96.7				96.7		23.3
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				8.8		17.7
Green Ext Time (p_c), s		22.8				22.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	731	90	721	979	0
Future Volume (vph)	731	90	721	979	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	31.5	31.5	31.5	80.5	80.5
Actuated g/C Ratio	0.26	0.26	0.26	0.67	0.67
v/c Ratio	0.57	0.20	0.84	0.86	0.91
Control Delay	40.8	8.1	44.1	26.1	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	8.1	44.1	26.1	30.7
LOS	D	A	D	C	C
Approach Delay	37.2		44.1		28.4
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 35.0	Intersection LOS: C
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	✣	
Traffic Volume (veh/h)	0	731	90	0	721	356	0	0	0	979	0	797
Future Volume (veh/h)	0	731	90	0	721	356	0	0	0	979	0	797
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	738	0	0	728	360				834	217	679
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1678	523	0	1119	523				958	228	712
Arrive On Green	0.00	0.34	0.00	0.00	0.11	0.11				0.59	0.59	0.59
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	385	1203
Grp Volume(v), veh/h	0	738	0	0	728	360				834	0	896
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1588
Q Serve(g_s), s	0.0	14.0	0.0	0.0	25.5	27.2				52.0	0.0	63.5
Cycle Q Clear(g_c), s	0.0	14.0	0.0	0.0	25.5	27.2				52.0	0.0	63.5
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.76
Lane Grp Cap(c), veh/h	0	1678	523	0	1119	523				958	0	940
V/C Ratio(X)	0.00	0.44	0.00	0.00	0.65	0.69				0.87	0.00	0.95
Avail Cap(c_a), veh/h	0	1678	523	0	1119	523				1100	0	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.6	0.0	0.0	46.4	47.1				20.6	0.0	23.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.0	2.9	7.3				6.3	0.0	15.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.4	0.0	0.0	12.1	12.6				24.6	0.0	31.7
LnGrp Delay(d),s/veh	0.0	31.4	0.0	0.0	49.3	54.4				27.0	0.0	38.5
LnGrp LOS		C			D	D				C		D
Approach Vol, veh/h		738			1088						1730	
Approach Delay, s/veh		31.4			51.0						32.9	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		45.5		74.5		45.5		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		16.0		65.5		29.2		
Green Ext Time (p_c), s		8.3		5.6		1.1		

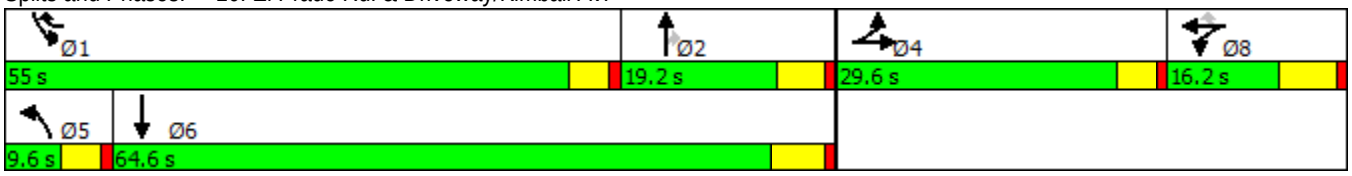
Intersection Summary	
HCM 2010 Ctrl Delay	38.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	36	8	3	945	4	206	24	1018	359
Future Volume (vph)	36	8	3	945	4	206	24	1018	359
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.18	0.07	0.14	0.84	0.05	0.79	0.07	1.21	0.18
Control Delay	42.8	29.8	48.4	14.1	53.2	64.8	0.4	131.1	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	29.8	48.4	14.1	53.2	64.8	0.4	131.1	10.8
LOS	D	C	D	B	D	E	A	F	B
Approach Delay		39.0	15.0			58.1			98.8
Approach LOS		D	B			E			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 63.3	Intersection LOS: E
Intersection Capacity Utilization 96.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	8	8	23	3	945	4	206	24	1018	359	14
Future Volume (veh/h)	36	8	8	23	3	945	4	206	24	1018	359	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	38	8	6	24	3	544	4	217	24	1072	378	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	121	72	54	148	19	894	78	244	207	790	1933	71
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.05	0.14	0.14	0.49	0.57	0.57
Sat Flow, veh/h	1619	956	717	1532	191	1530	1619	1800	1530	1619	3363	124
Grp Volume(v), veh/h	38	0	14	27	0	544	4	217	24	1072	192	200
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1723	0	1530	1619	1800	1530	1619	1710	1778
Q Serve(g_s), s	2.3	0.0	0.8	1.5	0.0	10.0	0.2	12.2	1.4	50.4	5.6	5.6
Cycle Q Clear(g_c), s	2.3	0.0	0.8	1.5	0.0	10.0	0.2	12.2	1.4	50.4	5.6	5.6
Prop In Lane	1.00		0.43	0.89		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	121	0	126	167	0	894	78	244	207	790	983	1022
V/C Ratio(X)	0.31	0.00	0.11	0.16	0.00	0.61	0.05	0.89	0.12	1.36	0.20	0.20
Avail Cap(c_a), veh/h	392	0	405	167	0	894	78	244	207	790	983	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	44.6	42.8	0.0	13.8	46.9	43.9	39.2	26.5	10.5	10.5
Incr Delay (d2), s/veh	1.5	0.0	0.4	0.5	0.0	1.2	0.1	30.6	0.2	169.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.4	0.7	0.0	10.3	0.1	8.2	0.6	59.5	2.6	2.8
LnGrp Delay(d),s/veh	46.7	0.0	45.0	43.3	0.0	15.0	47.0	74.5	39.5	195.7	10.6	10.6
LnGrp LOS	D		D	D		B	D	E	D	F	B	B
Approach Vol, veh/h		52			571			245			1464	
Approach Delay, s/veh		46.3			16.4			70.6			146.1	
Approach LOS		D			B			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.8		12.4	9.6	65.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	14.2		4.3	2.2	7.6		12.0
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	3.6		0.0

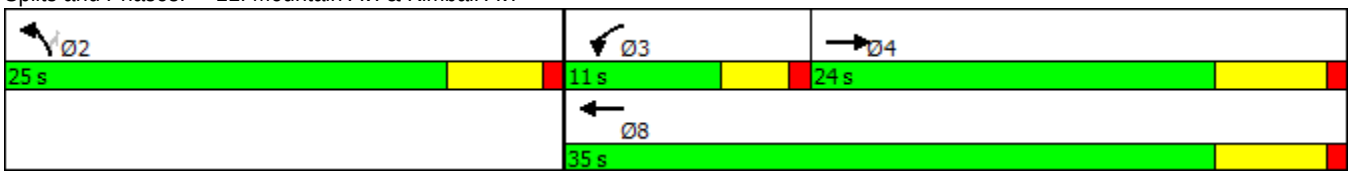
Intersection Summary	
HCM 2010 Ctrl Delay	104.2
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1053	50	820	148	143
Future Volume (vph)	1053	50	820	148	143
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	18.7	7.3	22.3	10.0	10.0
Actuated g/C Ratio	0.42	0.17	0.51	0.23	0.23
v/c Ratio	0.87	0.21	0.52	0.45	0.34
Control Delay	25.0	21.9	8.9	19.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	21.9	8.9	19.8	5.7
LOS	C	C	A	B	A
Approach Delay	25.0		9.6	12.9	
Approach LOS	C		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 61.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1053	93	50	820	148	143
Future Volume (veh/h)	1053	93	50	820	148	143
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1157	100	55	901	163	134
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1297	112	127	1976	262	247
Arrive On Green	0.41	0.41	0.08	0.58	0.16	0.16
Sat Flow, veh/h	3276	275	1619	3510	1619	1530
Grp Volume(v), veh/h	620	637	55	901	163	134
Grp Sat Flow(s),veh/h/ln	1710	1751	1619	1710	1619	1530
Q Serve(g_s), s	14.6	14.7	1.4	6.5	4.1	3.5
Cycle Q Clear(g_c), s	14.6	14.7	1.4	6.5	4.1	3.5
Prop In Lane		0.16	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	696	713	127	1976	262	247
V/C Ratio(X)	0.89	0.89	0.43	0.46	0.62	0.54
Avail Cap(c_a), veh/h	710	728	262	2289	736	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	12.0	19.1	5.2	16.9	16.7
Incr Delay (d2), s/veh	12.8	12.8	0.9	0.1	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	9.4	0.7	3.0	1.9	1.5
LnGrp Delay(d),s/veh	24.8	24.8	19.9	5.3	17.8	17.4
LnGrp LOS	C	C	B	A	B	B
Approach Vol, veh/h	1257			956	297	
Approach Delay, s/veh	24.8			6.1	17.6	
Approach LOS	C			A	B	

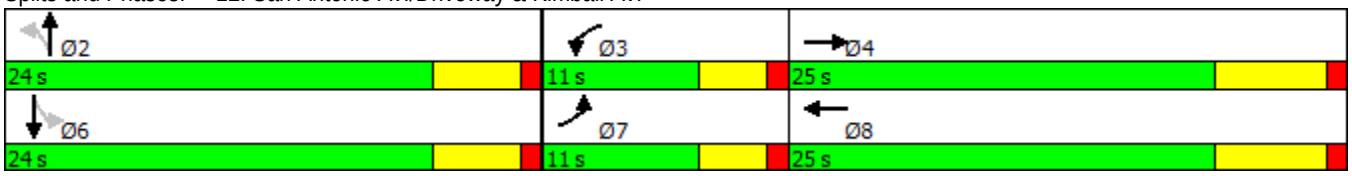
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	7.4	23.6				31.0
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		6.1	3.4	16.7				8.5
Green Ext Time (p_c), s		0.2	0.0	1.0				6.8

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	25	1152	15	804	65	0	76	0
Future Volume (vph)	25	1152	15	804	65	0	76	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	25.0	11.0	25.0	24.0	24.0	24.0	24.0
Total Split (%)	18.3%	41.7%	18.3%	41.7%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	19.7	7.2	19.7	9.1	9.1	9.1	9.1
Actuated g/C Ratio	0.17	0.47	0.17	0.47	0.22	0.22	0.22	0.22
v/c Ratio	0.09	0.78	0.06	0.53	0.24	0.03	0.29	0.02
Control Delay	19.0	17.4	18.8	11.5	16.2	0.1	17.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	17.4	18.8	11.5	16.2	0.1	17.0	0.0
LOS	B	B	B	B	B	A	B	A
Approach Delay		17.4		11.6		12.7		15.2
Approach LOS		B		B		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 41.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1152	42	15	804	12	65	0	18	76	0	9
Future Volume (veh/h)	25	1152	42	15	804	12	65	0	18	76	0	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	1213	44	16	846	13	68	0	17	80	0	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	1448	52	46	1429	22	405	0	265	397	0	265
Arrive On Green	0.04	0.43	0.43	0.03	0.41	0.41	0.17	0.00	0.17	0.17	0.00	0.17
Sat Flow, veh/h	1619	3366	122	1619	3446	53	1349	0	1530	1339	0	1530
Grp Volume(v), veh/h	26	616	641	16	420	439	68	0	17	80	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1778	1619	1710	1789	1349	0	1530	1339	0	1530
Q Serve(g_s), s	0.6	13.0	13.0	0.4	7.7	7.7	1.8	0.0	0.4	2.1	0.0	0.2
Cycle Q Clear(g_c), s	0.6	13.0	13.0	0.4	7.7	7.7	2.0	0.0	0.4	2.5	0.0	0.2
Prop In Lane	1.00		0.07	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	735	765	46	709	742	405	0	265	397	0	265
V/C Ratio(X)	0.37	0.84	0.84	0.35	0.59	0.59	0.17	0.00	0.06	0.20	0.00	0.03
Avail Cap(c_a), veh/h	280	803	835	280	803	841	808	0	722	798	0	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	10.3	10.3	19.3	9.2	9.2	14.7	0.0	14.0	15.0	0.0	13.9
Incr Delay (d2), s/veh	1.2	6.6	6.4	1.7	0.4	0.4	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.3	7.6	0.2	3.7	3.9	0.7	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	20.0	16.9	16.7	20.9	9.6	9.6	14.8	0.0	14.0	15.1	0.0	13.9
LnGrp LOS	B	B	B	C	A	A	B		B	B		B
Approach Vol, veh/h		1283			875			85			89	
Approach Delay, s/veh		16.8			9.8			14.7			15.0	
Approach LOS		B			A			B			B	

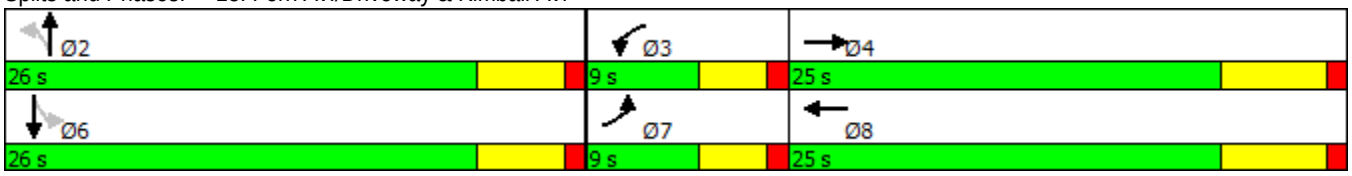
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.2	23.4		11.9	5.8	22.8
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		4.0	2.4	15.0		4.5	2.6	9.7
Green Ext Time (p_c), s		0.2	0.0	2.4		0.2	0.0	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1218	12	745	48	1	189	7
Future Volume (vph)	20	1218	12	745	48	1	189	7
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	19.9	5.2	19.9	11.4	11.4	11.4	11.4
Actuated g/C Ratio	0.12	0.46	0.12	0.46	0.26	0.26	0.26	0.26
v/c Ratio	0.12	0.90	0.07	0.55	0.17	0.10	0.66	0.11
Control Delay	22.9	25.2	22.3	12.6	13.7	5.6	25.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	25.2	22.3	12.6	13.7	5.6	25.1	6.5
LOS	C	C	C	B	B	A	C	A
Approach Delay		25.2		12.8		10.0		21.8
Approach LOS		C		B		B		C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 20.2	Intersection LOS: C
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1218	22	12	745	11	48	1	39	189	7	34
Future Volume (veh/h)	20	1218	22	12	745	11	48	1	39	189	7	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	23	1384	19	14	847	12	55	1	24	215	8	21
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	45	1496	21	29	1461	21	434	13	324	437	96	253
Arrive On Green	0.03	0.43	0.43	0.02	0.42	0.42	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1619	3453	47	1619	3451	49	1325	62	1478	1330	440	1156
Grp Volume(v), veh/h	23	685	718	14	420	439	55	0	25	215	0	29
Grp Sat Flow(s),veh/h/ln	1619	1710	1790	1619	1710	1790	1325	0	1539	1330	0	1596
Q Serve(g_s), s	0.6	16.8	16.8	0.4	8.3	8.3	1.5	0.0	0.6	6.8	0.0	0.6
Cycle Q Clear(g_c), s	0.6	16.8	16.8	0.4	8.3	8.3	2.2	0.0	0.6	7.3	0.0	0.6
Prop In Lane	1.00		0.03	1.00		0.03	1.00		0.96	1.00		0.72
Lane Grp Cap(c), veh/h	45	741	776	29	724	758	434	0	337	437	0	349
V/C Ratio(X)	0.51	0.92	0.93	0.48	0.58	0.58	0.13	0.00	0.07	0.49	0.00	0.08
Avail Cap(c_a), veh/h	183	746	781	183	746	781	775	0	734	779	0	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	11.9	11.9	21.5	9.8	9.8	14.6	0.0	13.7	16.6	0.0	13.7
Incr Delay (d2), s/veh	3.3	16.9	16.5	4.6	0.7	0.6	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	11.3	11.7	0.2	4.0	4.2	0.6	0.0	0.2	2.5	0.0	0.3
LnGrp Delay(d),s/veh	24.5	28.8	28.3	26.1	10.4	10.4	14.7	0.0	13.8	17.0	0.0	13.8
LnGrp LOS	C	C	C	C	B	B	B		B	B		B
Approach Vol, veh/h		1426			873			80			244	
Approach Delay, s/veh		28.5			10.7			14.4			16.6	
Approach LOS		C			B			B			B	

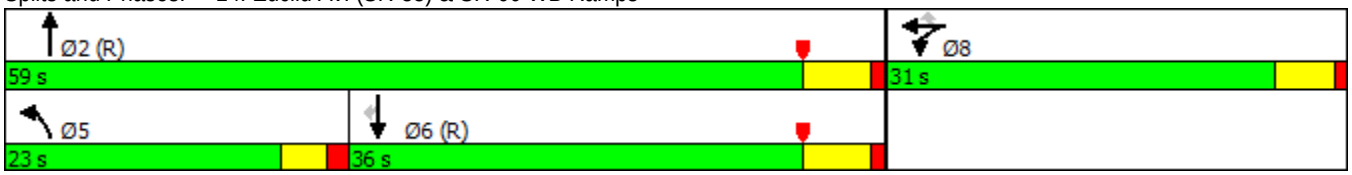
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.6	4.8	24.9		14.6	5.2	24.4
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		4.2	2.4	18.8		9.3	2.6	10.3
Green Ext Time (p_c), s		0.4	0.0	0.4		0.3	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	653	6	422	570	1082	948	549
Future Volume (vph)	653	6	422	570	1082	948	549
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.9	24.9	24.9	19.6	54.6	30.5	30.5
Actuated g/C Ratio	0.28	0.28	0.28	0.22	0.61	0.34	0.34
v/c Ratio	0.92	0.90	0.78	1.70	0.55	0.86	0.66
Control Delay	61.4	55.9	35.3	342.4	23.1	37.0	6.1
Queue Delay	0.0	0.0	0.0	0.0	3.6	0.0	0.0
Total Delay	61.4	55.9	35.3	342.4	26.7	37.0	6.1
LOS	E	E	D	F	C	D	A
Approach Delay		51.4			135.6	25.7	
Approach LOS		D			F	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.70	
Intersection Signal Delay: 75.2	Intersection LOS: E
Intersection Capacity Utilization 114.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	653	6	422	570	1082	0	0	948	549
Future Volume (veh/h)	0	0	0	653	6	422	570	1082	0	0	948	549
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				779	0	195	600	1139	0	0	998	578
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				855	0	399	333	2118	0	0	1244	538
Arrive On Green				0.26	0.00	0.26	0.41	1.00	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1480
Grp Volume(v), veh/h				779	0	195	600	1139	0	0	998	578
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1480
Q Serve(g_s), s				21.0	0.0	9.8	18.5	0.0	0.0	0.0	23.6	32.7
Cycle Q Clear(g_c), s				21.0	0.0	9.8	18.5	0.0	0.0	0.0	23.6	32.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				855	0	399	333	2118	0	0	1244	538
V/C Ratio(X)				0.91	0.00	0.49	1.80	0.54	0.00	0.00	0.80	1.07
Avail Cap(c_a), veh/h				935	0	436	333	2118	0	0	1244	538
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.1	0.0	28.0	26.5	0.0	0.0	0.0	25.7	28.6
Incr Delay (d2), s/veh				11.5	0.0	0.3	362.4	0.1	0.0	0.0	5.5	60.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.7	0.0	4.1	41.6	0.0	0.0	0.0	12.0	22.3
LnGrp Delay(d),s/veh				43.6	0.0	28.3	388.9	0.1	0.0	0.0	31.3	88.8
LnGrp LOS				D		C	F	A			C	F
Approach Vol, veh/h					974			1739			1576	
Approach Delay, s/veh					40.6			134.2			52.4	
Approach LOS					D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.2			23.0	38.2		28.8
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			20.5	34.7		23.0
Green Ext Time (p_c), s		41.1			0.0	0.0		0.8

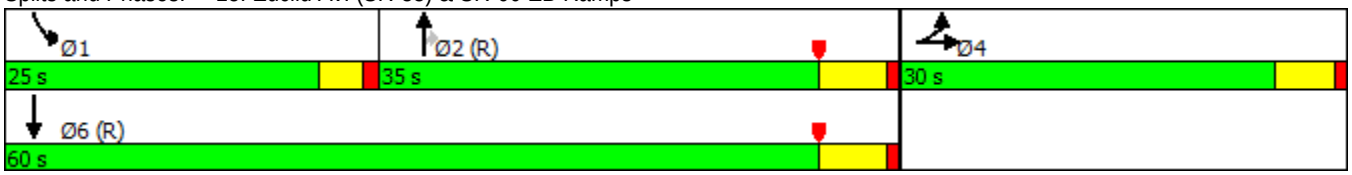
Intersection Summary	
HCM 2010 Ctrl Delay	82.9
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	392	2	1261	811	313	1288
Future Volume (vph)	392	2	1261	811	313	1288
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	25.0	25.0	30.7	30.7	19.8	54.5
Actuated g/C Ratio	0.28	0.28	0.34	0.34	0.22	0.61
v/c Ratio	0.85	1.37	1.10	0.88	0.90	0.63
Control Delay	50.5	207.1	89.8	18.2	52.3	5.4
Queue Delay	36.4	1.9	0.0	0.0	0.0	1.0
Total Delay	86.9	209.1	89.8	18.2	52.3	6.4
LOS	F	F	F	B	D	A
Approach Delay		164.0	61.8			15.4
Approach LOS		F	E			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 66.8	Intersection LOS: E
Intersection Capacity Utilization 114.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	392	2	562	0	0	0	0	1261	811	313	1288	0
Future Volume (veh/h)	392	2	562	0	0	0	0	1261	811	313	1288	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	400	2	496				0	1287	828	319	1314	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	450	2	424				0	1186	515	347	2071	0
Arrive On Green	0.28	0.28	0.28				0.00	0.35	0.35	0.28	0.81	0.00
Sat Flow, veh/h	1619	6	1525				0	3510	1484	1619	3510	0
Grp Volume(v), veh/h	400	0	498				0	1287	828	319	1314	0
Grp Sat Flow(s),veh/h/ln	1619	0	1531				0	1710	1484	1619	1710	0
Q Serve(g_s), s	21.3	0.0	25.0				0.0	31.2	31.2	17.2	13.8	0.0
Cycle Q Clear(g_c), s	21.3	0.0	25.0				0.0	31.2	31.2	17.2	13.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	450	0	425				0	1186	515	347	2071	0
V/C Ratio(X)	0.89	0.00	1.17				0.00	1.08	1.61	0.92	0.63	0.00
Avail Cap(c_a), veh/h	450	0	425				0	1186	515	378	2071	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.55	0.55	0.36	0.36	0.00
Uniform Delay (d), s/veh	31.2	0.0	32.5				0.0	29.4	29.4	31.4	4.8	0.0
Incr Delay (d2), s/veh	18.7	0.0	99.4				0.0	46.9	279.0	11.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	0.0	22.3				0.0	22.4	52.6	8.7	6.4	0.0
LnGrp Delay(d),s/veh	49.8	0.0	131.9				0.0	76.3	308.3	42.9	5.3	0.0
LnGrp LOS	D		F					F	F	D	A	
Approach Vol, veh/h		898						2115			1633	
Approach Delay, s/veh		95.3						167.1			12.7	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.3	36.7		30.0		60.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	19.2	33.2		27.0		15.8		
Green Ext Time (p_c), s	0.1	0.0		0.0		36.6		

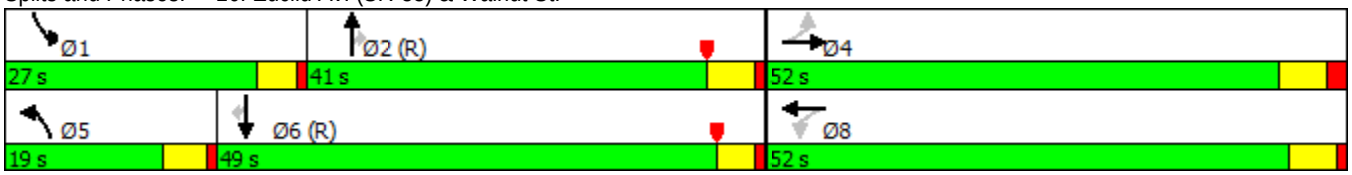
Intersection Summary	
HCM 2010 Ctrl Delay	99.0
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	126	327	100	284	136	1736	71	331	1371	140
Future Volume (vph)	126	327	100	284	136	1736	71	331	1371	140
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	52.0	52.0	52.0	52.0	19.0	41.0	41.0	27.0	49.0	49.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	15.8%	34.2%	34.2%	22.5%	40.8%	40.8%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	27.3	27.3	28.3	28.3	15.8	58.3	58.3	18.3	61.2	61.2
Actuated g/C Ratio	0.23	0.23	0.24	0.24	0.13	0.49	0.49	0.15	0.51	0.51
v/c Ratio	0.94	0.62	0.83	0.52	0.67	0.76	0.09	0.77	0.57	0.17
Control Delay	105.3	38.0	85.2	34.4	75.9	9.3	0.4	60.3	23.8	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.3	38.0	85.2	34.4	75.9	9.3	0.4	60.3	23.8	4.3
LOS	F	D	F	C	E	A	A	E	C	A
Approach Delay		52.1		44.3		13.6			28.9	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 27.3	Intersection LOS: C
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	327	147	100	284	124	136	1736	71	331	1371	140
Future Volume (veh/h)	126	327	147	100	284	124	136	1736	71	331	1371	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	131	341	122	104	296	108	142	1808	51	345	1428	87
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	242	724	255	218	722	258	165	2155	661	397	2297	713
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.14	0.58	0.58	0.13	0.47	0.47
Sat Flow, veh/h	938	2472	869	891	2465	880	1619	4914	1508	2956	4914	1526
Grp Volume(v), veh/h	131	234	229	104	203	201	142	1808	51	345	1428	87
Grp Sat Flow(s),veh/h/ln	938	1710	1631	891	1710	1634	1619	1638	1508	1478	1638	1526
Q Serve(g_s), s	15.7	13.4	13.9	13.0	11.5	11.9	10.3	36.0	1.8	13.7	26.2	3.9
Cycle Q Clear(g_c), s	27.6	13.4	13.9	26.9	11.5	11.9	10.3	36.0	1.8	13.7	26.2	3.9
Prop In Lane	1.00		0.53	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	242	501	478	218	501	479	165	2155	661	397	2297	713
V/C Ratio(X)	0.54	0.47	0.48	0.48	0.41	0.42	0.86	0.84	0.08	0.87	0.62	0.12
Avail Cap(c_a), veh/h	324	651	621	304	665	636	190	2155	661	554	2297	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.73	0.73	0.73
Uniform Delay (d), s/veh	45.3	34.7	34.9	46.0	34.0	34.2	51.0	21.6	14.4	50.9	24.0	18.0
Incr Delay (d2), s/veh	1.9	0.7	0.7	1.6	0.5	0.6	3.4	0.4	0.0	6.1	0.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	6.5	6.3	3.3	5.5	5.4	4.7	16.2	0.7	5.9	12.0	1.7
LnGrp Delay(d),s/veh	47.2	35.4	35.6	47.6	34.6	34.8	54.4	21.9	14.4	57.0	24.9	18.3
LnGrp LOS	D	D	D	D	C	C	D	C	B	E	C	B
Approach Vol, veh/h		594			508			2001			1860	
Approach Delay, s/veh		38.1			37.3			24.1			30.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.6	57.9		41.5	17.1	61.4		41.5
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	22.5	35.7		45.7	14.1	* 45		* 47
Max Q Clear Time (g_c+I1), s	15.7	38.0		29.6	12.3	28.2		28.9
Green Ext Time (p_c), s	0.4	0.0		5.6	0.1	14.5		5.8

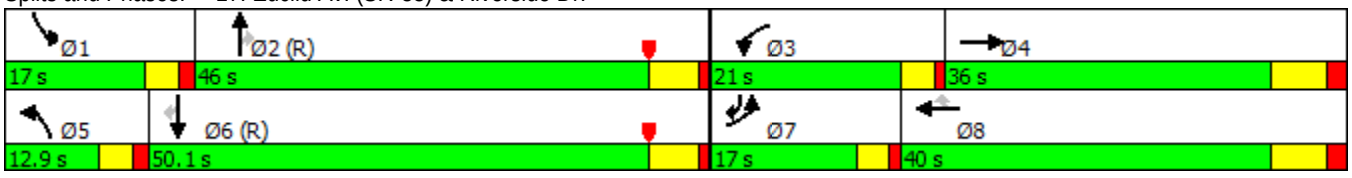
Intersection Summary	
HCM 2010 Ctrl Delay	29.5
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	152	391	179	351	56	111	1623	283	132	1220	168
Future Volume (vph)	152	391	179	351	56	111	1623	283	132	1220	168
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.0	24.4	16.2	27.6	27.6	12.4	44.5	44.5	13.9	46.0	60.5
Actuated g/C Ratio	0.11	0.20	0.14	0.23	0.23	0.10	0.37	0.37	0.12	0.38	0.50
v/c Ratio	0.94	0.75	0.88	0.48	0.14	0.71	1.38	0.45	0.76	1.00	0.21
Control Delay	107.0	49.7	88.2	41.3	2.2	54.0	210.8	27.9	62.2	60.6	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.0	49.7	88.2	41.3	2.2	54.0	210.8	27.9	62.2	60.6	11.7
LOS	F	D	F	D	A	D	F	C	E	E	B
Approach Delay		63.4		51.9			176.6			55.3	
Approach LOS		E		D			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.38	
Intersection Signal Delay: 107.4	Intersection LOS: F
Intersection Capacity Utilization 98.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	391	92	179	351	56	111	1623	283	132	1220	168
Future Volume (veh/h)	152	391	92	179	351	56	111	1623	283	132	1220	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	163	420	65	192	377	60	119	1745	173	142	1312	83
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	572	88	216	744	328	113	1356	607	166	1468	813
Arrive On Green	0.11	0.19	0.19	0.13	0.22	0.22	0.02	0.13	0.13	0.07	0.29	0.29
Sat Flow, veh/h	1619	2972	457	1619	3420	1507	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	163	240	245	192	377	60	119	1745	173	142	1312	83
Grp Sat Flow(s),veh/h/ln	1619	1710	1719	1619	1710	1507	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	12.0	15.9	16.1	14.0	11.6	3.9	8.4	47.6	12.3	10.4	44.1	4.0
Cycle Q Clear(g_c), s	12.0	15.9	16.1	14.0	11.6	3.9	8.4	47.6	12.3	10.4	44.1	4.0
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	329	331	216	744	328	113	1356	607	166	1468	813
V/C Ratio(X)	0.93	0.73	0.74	0.89	0.51	0.18	1.05	1.29	0.29	0.86	0.89	0.10
Avail Cap(c_a), veh/h	175	413	416	229	941	414	113	1356	607	169	1468	813
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.36	0.36	0.36	0.78	0.78	0.78
Uniform Delay (d), s/veh	53.0	45.5	45.6	51.1	41.3	38.3	58.6	52.1	36.8	55.0	40.1	17.2
Incr Delay (d2), s/veh	47.2	5.9	6.3	29.5	0.8	0.4	64.6	131.1	0.4	26.7	7.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	8.0	8.2	8.0	5.6	1.6	5.8	47.3	5.3	5.9	22.3	1.7
LnGrp Delay(d),s/veh	100.3	51.5	51.9	80.7	42.0	38.6	123.7	183.3	37.2	81.7	47.2	17.4
LnGrp LOS	F	D	D	F	D	D	F	F	D	F	D	B
Approach Vol, veh/h		648			629			2037			1537	
Approach Delay, s/veh		63.9			53.5			167.4			48.8	
Approach LOS		E			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.8	53.1	20.0	30.1	12.9	57.0	17.0	33.1
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	12.4	49.6	16.0	18.1	10.4	46.1	14.0	13.6
Green Ext Time (p_c), s	0.0	0.0	0.0	5.0	0.0	0.0	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	101.2
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	71	176	50	74	98	67	1966	216	15	1363	64
Future Volume (vph)	71	176	50	74	98	67	1966	216	15	1363	64
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	9.0	70.8	70.8	9.2	71.0	71.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	7.5%	59.0%	59.0%	7.7%	59.2%	59.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	23.5	23.5	23.5		23.5	9.3	79.7	79.7	5.5	70.7	70.7
Actuated g/C Ratio	0.20	0.20	0.20		0.20	0.08	0.66	0.66	0.05	0.59	0.59
v/c Ratio	0.41	0.51	0.15		0.85	0.55	0.89	0.21	0.20	0.70	0.07
Control Delay	46.8	47.0	8.4		74.4	56.5	27.0	7.0	79.5	5.0	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	47.0	8.4		74.4	56.5	27.0	7.0	79.5	5.0	0.1
LOS	D	D	A		E	E	C	A	E	A	A
Approach Delay		40.4			74.4		26.0			5.5	
Approach LOS		D			E		C			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 100.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	176	50	74	98	24	67	1966	216	15	1363	64
Future Volume (veh/h)	71	176	50	74	98	24	67	1966	216	15	1363	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	73	181	33	76	101	21	69	2027	167	15	1405	37
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	224	388	330	114	139	25	74	2156	965	27	2056	900
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.09	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1218	1800	1530	337	643	116	1619	3420	1530	1619	3420	1498
Grp Volume(v), veh/h	73	181	33	198	0	0	69	2027	167	15	1405	37
Grp Sat Flow(s),veh/h/ln	1218	1800	1530	1096	0	0	1619	1710	1530	1619	1710	1498
Q Serve(g_s), s	0.0	10.5	2.1	11.8	0.0	0.0	5.1	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	11.2	10.5	2.1	22.3	0.0	0.0	5.1	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	224	388	330	278	0	0	74	2156	965	27	2056	900
V/C Ratio(X)	0.33	0.47	0.10	0.71	0.00	0.00	0.93	0.94	0.17	0.57	0.68	0.04
Avail Cap(c_a), veh/h	296	495	421	366	0	0	74	2156	965	77	2056	900
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.12	0.12	0.12
Uniform Delay (d), s/veh	41.3	41.0	37.7	47.2	0.0	0.0	54.3	0.0	0.0	57.6	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.9	0.1	4.4	0.0	0.0	16.5	1.1	0.0	0.9	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.3	0.9	6.7	0.0	0.0	2.6	0.3	0.0	0.5	0.1	0.0
LnGrp Delay(d),s/veh	42.1	41.9	37.9	51.6	0.0	0.0	70.8	1.1	0.0	58.5	0.2	0.0
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		287			198			2263			1457	
Approach Delay, s/veh		41.5			51.6			3.2			0.8	
Approach LOS		D			D			A			A	

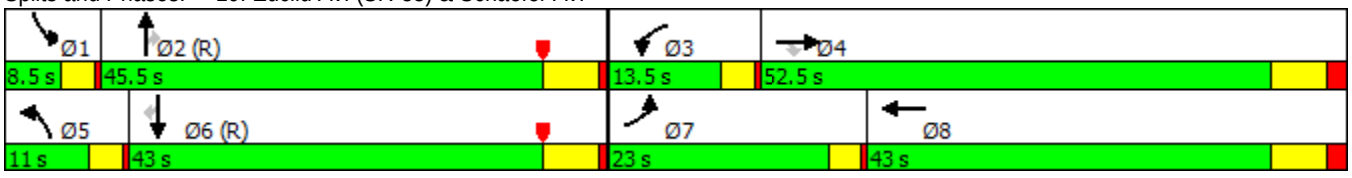
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	81.7		32.9	9.0	78.1		32.9
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	64.8		33.0	5.5	65.0		33.0
Max Q Clear Time (g_c+I1), s	3.1	2.0		13.2	7.1	2.0		24.3
Green Ext Time (p_c), s	0.0	52.2		2.3	0.0	52.3		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	7.3
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	306	230	190	28	50	125	1945	44	23	1354	134
Future Volume (vph)	306	230	190	28	50	125	1945	44	23	1354	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	27.3	27.3	10.0	14.8	17.0	65.8	65.8	5.7	51.0	51.0
Actuated g/C Ratio	0.16	0.23	0.23	0.08	0.12	0.14	0.55	0.55	0.05	0.42	0.42
v/c Ratio	1.20	0.58	0.39	0.22	0.30	0.56	1.07	0.05	0.32	0.96	0.19
Control Delay	164.8	45.8	6.4	55.6	38.6	40.5	62.2	3.1	73.9	39.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	164.8	45.8	6.4	55.6	38.6	40.5	62.2	3.1	73.9	39.3	5.3
LOS	F	D	A	E	D	D	E	A	E	D	A
Approach Delay		85.6			43.8		59.7			36.8	
Approach LOS		F			D		E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 55.8	Intersection LOS: E
Intersection Capacity Utilization 101.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	230	190	28	50	15	125	1945	44	23	1354	134
Future Volume (veh/h)	306	230	190	28	50	15	125	1945	44	23	1354	134
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	315	237	120	29	52	10	129	2005	36	24	1396	85
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	314	267	84	93	18	101	1998	894	37	1863	815
Arrive On Green	0.16	0.17	0.17	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1468	282	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	315	237	120	29	0	62	129	2005	36	24	1396	85
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1750	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	15.0	8.4	2.1	0.0	4.1	7.5	70.1	2.3	1.8	46.4	5.7
Cycle Q Clear(g_c), s	19.5	15.0	8.4	2.1	0.0	4.1	7.5	70.1	2.3	1.8	46.4	5.7
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	314	267	84	0	111	101	1998	894	37	1863	815
V/C Ratio(X)	1.20	0.75	0.45	0.35	0.00	0.56	1.27	1.00	0.04	0.65	0.75	0.10
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	1998	894	67	1863	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.68	0.68	0.68
Uniform Delay (d), s/veh	50.3	47.1	44.4	54.9	0.0	54.5	58.8	48.4	21.1	59.1	41.5	24.7
Incr Delay (d2), s/veh	119.6	2.8	0.9	0.9	0.0	3.2	130.7	6.9	0.0	4.7	1.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.4	7.7	3.6	0.9	0.0	2.1	7.0	35.1	1.0	0.8	22.6	2.4
LnGrp Delay(d),s/veh	169.8	49.8	45.2	55.9	0.0	57.7	189.5	55.3	21.1	63.7	43.4	24.9
LnGrp LOS	F	D	D	E		E	F	F	C	E	D	C
Approach Vol, veh/h		672			91			2170			1505	
Approach Delay, s/veh		105.3			57.1			62.7			42.7	
Approach LOS		F			E			E			D	

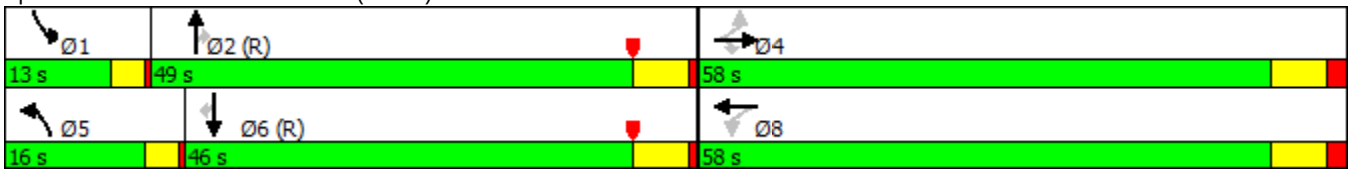
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	76.1	9.7	27.9	11.0	71.4	23.0	14.6
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.8	72.1	4.1	17.0	9.5	48.4	21.5	6.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	62.3
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	350	480	287	30	143	183	1697	81	70	1325	172
Future Volume (vph)	350	480	287	30	143	183	1697	81	70	1325	172
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	45.1	45.1	45.1	45.1	45.1	17.0	51.8	51.8	8.4	41.4	41.4
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.14	0.43	0.43	0.07	0.34	0.34
v/c Ratio	0.89	0.72	0.42	0.19	0.27	0.82	1.17	0.12	0.63	1.14	0.30
Control Delay	59.3	38.2	8.8	25.8	24.1	56.9	115.6	14.9	86.2	95.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	38.2	8.8	25.8	24.1	56.9	115.6	14.9	86.2	95.4	4.9
LOS	E	D	A	C	C	E	F	B	F	F	A
Approach Delay		37.3			24.3		106.0			85.1	
Approach LOS		D			C		F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 80.0	Intersection LOS: E
Intersection Capacity Utilization 105.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	480	287	30	143	31	183	1697	81	70	1325	172
Future Volume (veh/h)	350	480	287	30	143	31	183	1697	81	70	1325	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	357	490	201	31	146	27	187	1732	63	71	1352	149
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	451	723	606	188	594	110	169	1391	622	87	1219	546
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.03	0.13	0.13	0.11	0.71	0.71
Sat Flow, veh/h	1163	1800	1509	722	1478	273	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	357	490	201	31	0	173	187	1732	63	71	1352	149
Grp Sat Flow(s),veh/h/ln	1163	1800	1509	722	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	35.3	26.9	11.0	4.4	0.0	7.9	12.5	48.8	4.3	5.1	42.8	4.2
Cycle Q Clear(g_c), s	43.2	26.9	11.0	31.3	0.0	7.9	12.5	48.8	4.3	5.1	42.8	4.2
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	451	723	606	188	0	704	169	1391	622	87	1219	546
V/C Ratio(X)	0.79	0.68	0.33	0.16	0.00	0.25	1.11	1.25	0.10	0.81	1.11	0.27
Avail Cap(c_a), veh/h	478	765	641	205	0	744	169	1391	622	128	1219	546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.55	0.55	0.55	0.36	0.36	0.36
Uniform Delay (d), s/veh	38.2	29.5	24.8	42.4	0.0	23.8	57.9	51.9	32.7	52.9	17.2	11.7
Incr Delay (d2), s/veh	8.4	2.2	0.3	0.4	0.0	0.2	83.9	113.9	0.2	5.3	53.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	13.8	4.6	0.9	0.0	3.8	9.5	45.1	1.9	2.4	28.4	1.8
LnGrp Delay(d),s/veh	46.6	31.8	25.1	42.8	0.0	24.0	141.8	165.8	32.9	58.3	71.0	12.1
LnGrp LOS	D	C	C	D		C	F	F	C	E	F	B
Approach Vol, veh/h		1048			204			1982			1572	
Approach Delay, s/veh		35.5			26.9			159.3			64.9	
Approach LOS		D			C			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	54.8		55.2	16.0	48.8		55.2
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	7.1	50.8		45.2	14.5	44.8		33.3
Green Ext Time (p_c), s	0.0	0.0		3.1	0.0	0.0		5.9

Intersection Summary	
HCM 2010 Ctrl Delay	95.8
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	50	29	212	8	13	151	1842	15	11	1612	51
Future Volume (vph)	50	29	212	8	13	151	1842	15	11	1612	51
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.8	15.8	15.8	15.8	15.8	17.0	90.0	90.0	5.5	73.1	73.1
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.14	0.75	0.75	0.05	0.61	0.61
v/c Ratio	0.33	0.14	0.65	0.05	0.11	0.72	0.78	0.01	0.16	0.84	0.06
Control Delay	47.4	41.0	20.7	37.4	25.6	58.9	14.3	0.0	70.4	13.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	41.0	20.7	37.4	25.6	58.9	14.3	0.0	70.4	13.4	0.1
LOS	D	D	C	D	C	E	B	A	E	B	A
Approach Delay		27.3			28.7		17.5			13.4	
Approach LOS		C			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	29	212	8	13	10	151	1842	15	11	1612	51
Future Volume (veh/h)	50	29	212	8	13	10	151	1842	15	11	1612	51
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	32	125	9	14	9	164	2002	15	12	1752	55
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	183	156	161	104	67	175	2626	1175	22	2302	1007
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.77	0.77	0.03	1.00	1.00
Sat Flow, veh/h	1332	1800	1530	1180	1025	659	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	54	32	125	9	0	23	164	2002	15	12	1752	55
Grp Sat Flow(s),veh/h/ln	1332	1800	1530	1180	0	1684	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.6	2.0	9.6	0.8	0.0	1.5	12.1	39.3	0.3	0.9	0.0	0.0
Cycle Q Clear(g_c), s	6.1	2.0	9.6	2.8	0.0	1.5	12.1	39.3	0.3	0.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	183	156	161	0	171	175	2626	1175	22	2302	1007
V/C Ratio(X)	0.30	0.17	0.80	0.06	0.00	0.13	0.94	0.76	0.01	0.54	0.76	0.05
Avail Cap(c_a), veh/h	510	630	535	454	0	589	175	2626	1175	67	2302	1007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	51.9	49.3	52.7	50.6	0.0	49.1	53.1	7.8	3.3	58.0	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.3	7.0	0.1	0.0	0.3	49.1	2.2	0.0	1.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.0	4.4	0.3	0.0	0.7	7.8	18.9	0.1	0.4	0.1	0.0
LnGrp Delay(d),s/veh	52.5	49.6	59.7	50.7	0.0	49.3	102.2	10.0	3.3	59.3	0.2	0.0
LnGrp LOS	D	D	E	D		D	F	A	A	E	A	A
Approach Vol, veh/h		211			32			2181			1819	
Approach Delay, s/veh		56.3			49.7			16.9			0.6	
Approach LOS		E			D			B			A	

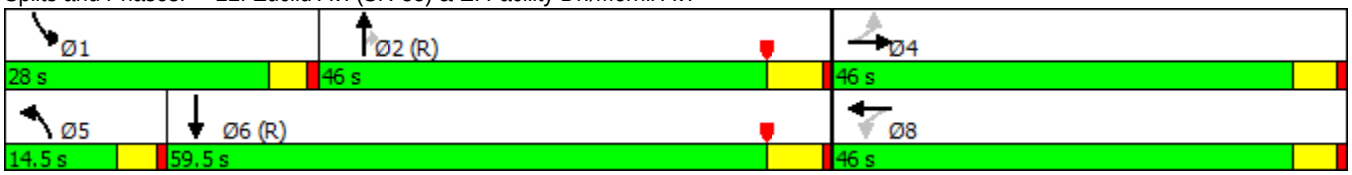
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	97.8		17.0	16.5	86.5		17.0
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.9	41.3		11.6	14.1	2.0		4.8
Green Ext Time (p_c), s	0.0	16.9		0.6	0.0	44.1		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	21	182	0	2	1594	350	690	1123
Future Volume (vph)	5	21	182	0	2	1594	350	690	1123
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	10.0	40.0	40.0	23.5	65.1
Actuated g/C Ratio		0.34		0.34	0.08	0.33	0.33	0.20	0.54
v/c Ratio		0.07		1.21	0.01	1.50	0.67	2.35	0.65
Control Delay		20.8		139.3	76.5	251.5	12.9	632.6	25.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.8		139.3	76.5	251.5	12.9	632.6	25.6
LOS		C		F	E	F	B	F	C
Approach Delay		20.8		139.3		208.4			256.4
Approach LOS		C		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.35	
Intersection Signal Delay: 216.5	Intersection LOS: F
Intersection Capacity Utilization 149.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	11	182	0	457	2	1594	350	690	1123	1
Future Volume (veh/h)	5	21	11	182	0	457	2	1594	350	690	1123	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	23	4	196	0	463	2	1714	347	742	1208	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	88	380	62	189	2	360	9	1140	499	317	1837	2
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.33	0.33	0.20	0.52	0.52
Sat Flow, veh/h	156	1111	181	440	6	1053	1619	3420	1496	1619	3507	3
Grp Volume(v), veh/h	32	0	0	659	0	0	2	1714	347	742	589	620
Grp Sat Flow(s),veh/h/ln	1448	0	0	1499	0	0	1619	1710	1496	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	39.5	0.0	0.0	0.1	40.0	24.2	23.5	30.0	30.0
Cycle Q Clear(g_c), s	1.5	0.0	0.0	41.0	0.0	0.0	0.1	40.0	24.2	23.5	30.0	30.0
Prop In Lane	0.16		0.12	0.30		0.70	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	529	0	0	551	0	0	9	1140	499	317	896	943
V/C Ratio(X)	0.06	0.00	0.00	1.20	0.00	0.00	0.23	1.50	0.70	2.34	0.66	0.66
Avail Cap(c_a), veh/h	529	0	0	551	0	0	135	1140	499	317	896	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	40.9	0.0	0.0	59.4	40.0	34.7	48.3	20.8	20.8
Incr Delay (d2), s/veh	0.0	0.0	0.0	105.0	0.0	0.0	0.4	227.0	0.7	612.9	3.8	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	34.3	0.0	0.0	0.1	54.8	10.0	64.5	15.0	15.7
LnGrp Delay(d),s/veh	26.5	0.0	0.0	145.8	0.0	0.0	59.9	267.0	35.5	661.1	24.5	24.3
LnGrp LOS	C			F			E	F	D	F	C	C
Approach Vol, veh/h		32			659			2063			1951	
Approach Delay, s/veh		26.5			145.8			227.9			266.6	
Approach LOS		C			F			F			F	

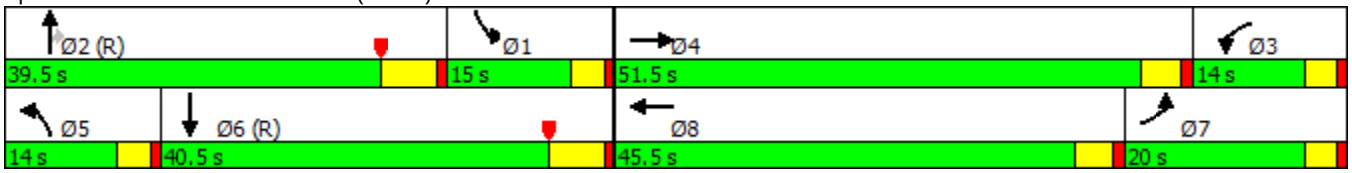
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.0	46.0		46.0	5.1	68.9		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	25.5	42.0		3.5	2.1	32.0		43.0
Green Ext Time (p_c), s	0.0	0.0		3.0	0.0	18.6		0.0

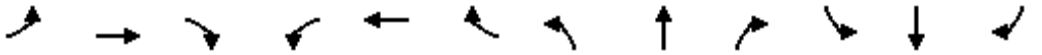
Intersection Summary			
HCM 2010 Ctrl Delay		231.1	
HCM 2010 LOS		F	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	629	822	231	440	125	822	160	284	884
Future Volume (vph)	629	822	231	440	125	822	160	284	884
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	23.2	40.3	16.7	33.8	10.0	32.8	32.8	11.7	34.5
Actuated g/C Ratio	0.19	0.34	0.14	0.28	0.08	0.27	0.27	0.10	0.29
v/c Ratio	2.10	0.83	1.08	0.88	0.97	0.92	0.31	1.87	1.17
Control Delay	530.1	42.7	131.0	42.1	96.4	46.2	12.7	438.7	114.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	530.1	42.7	131.0	42.1	96.4	46.2	12.7	438.7	114.8
LOS	F	D	F	D	F	D	B	F	F
Approach Delay		242.7		60.6		47.0			182.1
Approach LOS		F		E		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.10	
Intersection Signal Delay: 144.7	Intersection LOS: F
Intersection Capacity Utilization 123.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	629	822	82	231	440	441	125	822	160	284	884	201
Future Volume (veh/h)	629	822	82	231	440	441	125	822	160	284	884	201
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	655	856	81	241	458	425	130	856	152	296	921	191
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	216	985	93	200	516	462	135	933	418	196	921	191
Arrive On Green	0.13	0.31	0.31	0.12	0.30	0.30	0.03	0.09	0.09	0.12	0.33	0.33
Sat Flow, veh/h	1619	3158	299	1619	1710	1530	1619	3420	1530	1619	2815	583
Grp Volume(v), veh/h	655	463	474	241	458	425	130	856	152	296	559	553
Grp Sat Flow(s),veh/h/ln	1619	1710	1747	1619	1710	1530	1619	1710	1530	1619	1710	1688
Q Serve(g_s), s	16.0	30.7	30.7	14.8	30.6	32.2	9.6	29.8	11.2	14.5	39.2	39.3
Cycle Q Clear(g_c), s	16.0	30.7	30.7	14.8	30.6	32.2	9.6	29.8	11.2	14.5	39.2	39.3
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	216	533	545	200	516	462	135	933	418	196	560	553
V/C Ratio(X)	3.03	0.87	0.87	1.21	0.89	0.92	0.96	0.92	0.36	1.51	1.00	1.00
Avail Cap(c_a), veh/h	216	670	684	200	584	523	135	955	427	196	560	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.37	0.37	0.37	1.00	1.00	1.00	0.40	0.40	0.40	0.71	0.71	0.71
Uniform Delay (d), s/veh	52.0	39.0	39.0	52.6	39.9	40.5	58.2	53.2	44.8	52.7	40.3	40.4
Incr Delay (d2), s/veh	919.9	4.0	3.9	130.1	13.1	19.2	39.0	7.1	1.0	247.9	31.9	32.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	62.3	15.0	15.3	13.8	16.4	16.0	5.8	15.1	4.9	20.0	23.4	23.2
LnGrp Delay(d),s/veh	971.9	43.0	42.9	182.7	53.1	59.7	97.1	60.4	45.8	300.6	72.2	72.8
LnGrp LOS	F	D	D	F	D	E	F	E	D	F	E	F
Approach Vol, veh/h		1592			1124			1138			1408	
Approach Delay, s/veh		425.2			83.4			62.6			120.5	
Approach LOS		F			F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.5	38.8	18.8	41.9	14.0	45.3	20.0	40.7
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	16.5	31.8	16.8	32.7	11.6	41.3	18.0	34.2
Green Ext Time (p_c), s	0.0	1.0	0.0	4.7	0.0	0.0	0.0	2.0

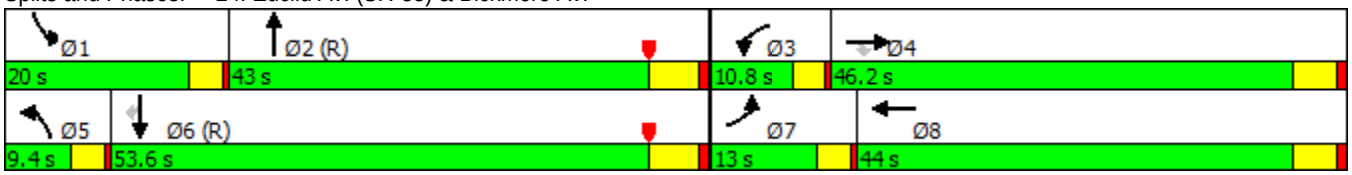
Intersection Summary	
HCM 2010 Ctrl Delay	192.2
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	116	120	119	163	43	47	872	219	863	78
Future Volume (vph)	116	120	119	163	43	47	872	219	863	78
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.5	17.8	17.8	7.3	15.6	7.4	52.2	25.2	71.7	71.7
Actuated g/C Ratio	0.08	0.15	0.15	0.06	0.13	0.06	0.44	0.21	0.60	0.60
v/c Ratio	1.02	0.50	0.39	1.85	0.58	0.53	0.84	0.72	0.47	0.09
Control Delay	139.0	50.7	9.0	449.1	22.2	80.9	15.0	57.3	5.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.0	50.7	9.0	449.1	22.2	80.9	15.0	57.3	5.3	0.9
LOS	F	D	A	F	C	F	B	E	A	A
Approach Delay		65.6			232.7		17.7		14.8	
Approach LOS		E			F		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.85	
Intersection Signal Delay: 46.0	Intersection LOS: D
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	120	119	163	43	124	47	872	223	219	863	78
Future Volume (veh/h)	116	120	119	163	43	124	47	872	223	219	863	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	129	133	113	181	48	126	52	969	238	243	959	87
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	128	272	232	98	59	154	65	1368	335	223	2059	902
Arrive On Green	0.08	0.15	0.15	0.06	0.13	0.13	0.05	0.67	0.67	0.28	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	440	1156	1619	2712	664	1619	3420	1498
Grp Volume(v), veh/h	129	133	113	181	0	174	52	610	597	243	959	87
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1596	1619	1710	1666	1619	1710	1498
Q Serve(g_s), s	9.5	8.1	8.1	7.3	0.0	12.7	3.8	26.8	27.0	16.5	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.1	8.1	7.3	0.0	12.7	3.8	26.8	27.0	16.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.72	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	128	272	232	98	0	212	65	863	841	223	2059	902
V/C Ratio(X)	1.01	0.49	0.49	1.84	0.00	0.82	0.81	0.71	0.71	1.09	0.47	0.10
Avail Cap(c_a), veh/h	128	618	525	98	0	519	80	863	841	223	2059	902
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.3	46.7	46.7	56.3	0.0	50.6	56.4	14.2	14.2	43.5	0.0	0.0
Incr Delay (d2), s/veh	81.2	0.5	0.6	413.5	0.0	3.0	3.6	0.5	0.5	48.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	4.1	3.5	14.6	0.0	5.8	1.8	12.6	12.3	10.3	0.0	0.0
LnGrp Delay(d),s/veh	136.5	47.2	47.3	469.9	0.0	53.6	60.0	14.6	14.7	92.1	0.1	0.0
LnGrp LOS	F	D	D	F		D	E	B	B	F	A	A
Approach Vol, veh/h		375			355			1259			1289	
Approach Delay, s/veh		77.9			265.8			16.5			17.4	
Approach LOS		E			F			B			B	

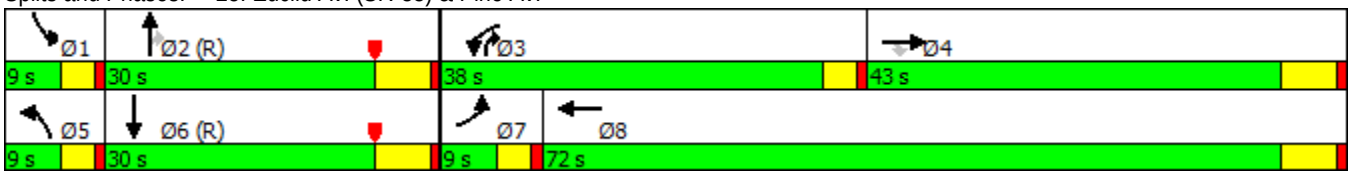
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	66.0	10.8	23.2	8.3	77.8	13.0	21.0
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	18.5	29.0	9.3	10.1	5.8	2.0	11.5	14.7
Green Ext Time (p_c), s	0.0	5.4	0.0	1.3	0.0	11.5	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	50.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	346	29	484	78	34	1010	1095	127	966
Future Volume (vph)	15	346	29	484	78	34	1010	1095	127	966
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	29.7	29.7	34.0	64.1	6.2	24.0	64.0	12.3	33.9
Actuated g/C Ratio	0.04	0.25	0.25	0.28	0.53	0.05	0.20	0.53	0.10	0.28
v/c Ratio	0.22	0.80	0.06	0.60	0.16	0.42	1.52	1.23	0.79	1.05
Control Delay	63.7	55.8	0.2	40.6	8.8	67.7	268.8	127.6	69.5	75.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	55.8	0.2	40.6	8.8	67.7	268.8	127.6	69.5	75.3
LOS	E	E	A	D	A	E	F	F	E	E
Approach Delay		52.0			33.4		193.3			74.6
Approach LOS		D			C		F			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.52	
Intersection Signal Delay: 126.1	Intersection LOS: F
Intersection Capacity Utilization 110.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	346	29	484	78	64	34	1010	1095	127	966	15
Future Volume (veh/h)	15	346	29	484	78	64	34	1010	1095	127	966	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	357	0	499	80	60	35	1041	696	131	996	11
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	417	354	556	385	289	46	1273	857	67	1334	15
Arrive On Green	0.02	0.23	0.00	0.19	0.40	0.40	0.03	0.37	0.37	0.01	0.13	0.13
Sat Flow, veh/h	1619	1800	1530	2956	956	717	1619	3420	1530	1619	3464	38
Grp Volume(v), veh/h	15	357	0	499	0	140	35	1041	696	131	492	515
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1673	1619	1710	1530	1619	1710	1792
Q Serve(g_s), s	1.1	22.8	0.0	19.8	0.0	6.5	2.6	33.0	44.0	5.0	33.3	33.3
Cycle Q Clear(g_c), s	1.1	22.8	0.0	19.8	0.0	6.5	2.6	33.0	44.0	5.0	33.3	33.3
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	27	417	354	556	0	675	46	1273	857	67	659	690
V/C Ratio(X)	0.57	0.86	0.00	0.90	0.00	0.21	0.75	0.82	0.81	1.94	0.75	0.75
Avail Cap(c_a), veh/h	67	555	472	838	0	920	67	1273	857	67	659	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.70	0.70	0.70
Uniform Delay (d), s/veh	58.6	44.2	0.0	47.6	0.0	23.3	57.9	34.0	21.3	59.2	46.7	46.7
Incr Delay (d2), s/veh	6.8	11.2	0.0	6.4	0.0	0.2	1.2	0.6	0.8	459.6	5.4	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.6	0.0	8.6	0.0	3.1	1.2	15.6	18.7	10.9	16.8	17.5
LnGrp Delay(d),s/veh	65.4	55.4	0.0	54.0	0.0	23.5	59.1	34.6	22.1	518.8	52.1	51.9
LnGrp LOS	E	E		D		C	E	C	C	F	D	D
Approach Vol, veh/h		372			639			1772			1138	
Approach Delay, s/veh		55.8			47.3			30.1			105.7	
Approach LOS		E			D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	50.7	26.6	33.8	7.4	52.2	6.0	54.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	46.0	21.8	24.8	4.6	35.3	3.1	8.5
Green Ext Time (p_c), s	0.0	0.0	0.8	2.9	0.0	0.0	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	57.3
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	843	181	316	1213	155	1389
Future Volume (vph)	843	181	316	1213	155	1389
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	47.0	47.0	37.0	84.0	36.0	36.0
Total Split (%)	39.2%	39.2%	30.8%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	47.9	47.9	28.1	79.5	32.5	32.5
Actuated g/C Ratio	0.40	0.40	0.23	0.66	0.27	0.27
v/c Ratio	0.69	0.27	0.88	0.60	0.19	1.99
Control Delay	35.9	9.0	68.3	3.9	34.4	467.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	9.0	68.3	3.9	34.4	467.2
LOS	D	A	E	A	C	F
Approach Delay	31.1			17.2	423.8	
Approach LOS	C			B	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.99	
Intersection Signal Delay: 173.9	Intersection LOS: F
Intersection Capacity Utilization 122.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	843	181	316	1213	155	1389
Future Volume (veh/h)	843	181	316	1213	155	1389
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	937	0	351	1348	172	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2094	937	377	2947	238	110
Arrive On Green	0.81	0.00	0.22	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	937	0	351	1348	172	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	9.6	0.0	24.1	10.8	6.1	0.0
Cycle Q Clear(g_c), s	9.6	0.0	24.1	10.8	6.1	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2094	937	377	2947	238	110
V/C Ratio(X)	0.45	0.00	0.93	0.46	0.72	0.00
Avail Cap(c_a), veh/h	2094	937	479	2947	901	414
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.35	0.35	1.00	0.00
Uniform Delay (d), s/veh	5.2	0.0	45.9	1.9	54.5	0.0
Incr Delay (d2), s/veh	0.7	0.0	8.7	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	12.3	4.9	2.9	0.0
LnGrp Delay(d),s/veh	5.9	0.0	54.6	2.1	58.6	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	937			1699	172	
Approach Delay, s/veh	5.9			12.9	58.6	
Approach LOS	A			B	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	29.9	78.0				107.9		12.1
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	33.5	42.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	26.1	11.6				12.8		8.1
Green Ext Time (p_c), s	0.3	17.0				22.9		0.5

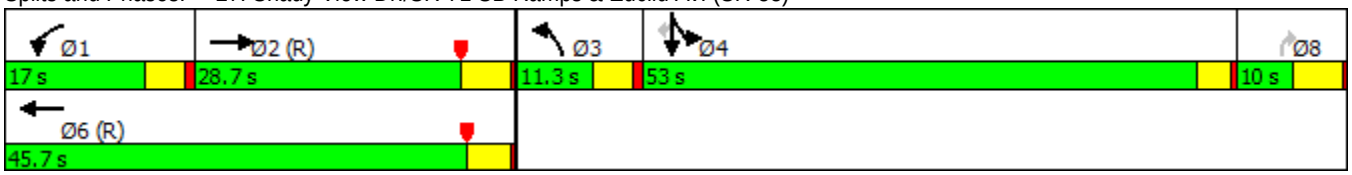
Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	323	103	245	31	16	756	146	159
Future Volume (vph)	323	103	245	31	16	756	146	159
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.7	17.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.9%	14.2%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	35.9	11.6	52.5	6.5	5.0	42.7	42.7	42.7
Actuated g/C Ratio	0.30	0.10	0.44	0.05	0.04	0.36	0.36	0.36
v/c Ratio	0.37	0.68	0.17	0.37	0.08	0.84	0.80	0.25
Control Delay	37.0	69.6	11.2	66.7	0.9	49.8	45.1	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	69.6	11.2	66.7	0.9	49.8	45.1	4.3
LOS	D	E	B	E	A	D	D	A
Approach Delay	37.0		28.5				41.0	
Approach LOS	D		C				D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 37.9 — Intersection LOS: D
Intersection Capacity Utilization 61.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	323	45	103	245	0	31	0	16	756	146	159
Future Volume (veh/h)	0	323	45	103	245	0	31	0	16	756	146	159
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	333	46	106	253	0	32	0	16	887	0	164
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1525	209	128	2123	0	0	0	0	998	0	472
Arrive On Green	0.00	0.50	0.50	0.10	0.83	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3113	414	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	187	192	106	253	0		0.0		887	0	164
Grp Sat Flow(s),veh/h/ln	0	1710	1727	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	7.3	7.4	7.7	1.7	0.0				31.3	0.0	10.0
Cycle Q Clear(g_c), s	0.0	7.3	7.4	7.7	1.7	0.0				31.3	0.0	10.0
Prop In Lane	0.00		0.24	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	863	871	128	2123	0				998	0	472
V/C Ratio(X)	0.00	0.22	0.22	0.83	0.12	0.00				0.89	0.00	0.35
Avail Cap(c_a), veh/h	0	863	871	169	2123	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.5	16.6	52.9	4.1	0.0				39.5	0.0	32.2
Incr Delay (d2), s/veh	0.0	0.6	0.6	22.2	0.1	0.0				6.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	3.7	4.2	0.8	0.0				14.9	0.0	4.2
LnGrp Delay(d),s/veh	0.0	17.1	17.2	75.1	4.2	0.0				45.6	0.0	32.6
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		379			359						1051	
Approach Delay, s/veh		17.1			25.2						43.6	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.0	65.5		40.5		79.5		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	12.5	23.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.7	9.4		33.3		3.7		
Green Ext Time (p_c), s	0.1	2.1		3.7		2.5		

Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1226	47	3	978	193	13
Future Volume (vph)	1226	47	3	978	193	13
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	74.0	74.0	5.0	75.6	18.8	18.8
Actuated g/C Ratio	0.70	0.70	0.05	0.71	0.18	0.18
v/c Ratio	1.06	0.05	0.04	0.83	0.73	0.05
Control Delay	61.6	3.6	54.3	18.9	57.1	17.0
Queue Delay	0.0	0.0	0.0	0.9	0.0	0.0
Total Delay	61.6	3.6	54.3	19.7	57.1	17.0
LOS	E	A	D	B	E	B
Approach Delay	59.5			19.8	54.6	
Approach LOS	E			B	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 105.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 43.3	Intersection LOS: D
Intersection Capacity Utilization 89.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1226	47	3	978	193	13
Future Volume (veh/h)	1226	47	3	978	193	13
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1333	51	3	1063	210	14
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1247	1060	6	1334	244	230
Arrive On Green	0.69	0.69	0.00	0.74	0.15	0.15
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1333	51	3	1063	210	14
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	72.1	1.1	0.2	38.9	13.2	0.8
Cycle Q Clear(g_c), s	72.1	1.1	0.2	38.9	13.2	0.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1247	1060	6	1334	244	230
V/C Ratio(X)	1.07	0.05	0.46	0.80	0.86	0.06
Avail Cap(c_a), veh/h	1247	1060	78	1413	420	397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	5.1	51.7	8.5	43.2	37.9
Incr Delay (d2), s/veh	46.1	0.0	18.0	3.1	8.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	50.9	0.5	0.1	20.1	6.5	0.4
LnGrp Delay(d),s/veh	62.1	5.1	69.7	11.7	51.9	38.0
LnGrp LOS	F	A	E	B	D	D
Approach Vol, veh/h	1384			1066	224	
Approach Delay, s/veh	60.0			11.8	51.1	
Approach LOS	E			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.0	78.3				83.3		20.8
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.2	74.1				40.9		15.2
Green Ext Time (p_c), s	0.0	0.0				30.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	40.0
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	37	0	206	46	4
Future Vol, veh/h	0	37	0	206	46	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	40	0	224	50	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	52	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	1021	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	1021	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1021	-	-
HCM Lane V/C Ratio	-	0.039	-	-
HCM Control Delay (s)	-	8.7	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	26	180	1	6	77
Future Vol, veh/h	5	26	180	1	6	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	28	196	1	7	84

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	293	196	0	0	197	0
Stage 1	196	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	702	850	-	-	1388	-
Stage 1	842	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	698	850	-	-	1388	-
Mov Cap-2 Maneuver	718	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	927	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	826	1388	-
HCM Lane V/C Ratio	-	-	0.041	0.005	-
HCM Control Delay (s)	-	-	9.5	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	3	1	163	78	4
Future Vol, veh/h	19	3	1	163	78	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	21	3	1	177	85	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	266	87	89	0	-	0
Stage 1	87	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	727	977	1519	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	857	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	726	977	1519	-	-	-
Mov Cap-2 Maneuver	737	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	856	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1519	-	763	-	-
HCM Lane V/C Ratio	0.001	-	0.031	-	-
HCM Control Delay (s)	7.4	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	8	155	1	2	78
Future Vol, veh/h	5	8	155	1	2	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	9	168	1	2	85

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	258	169	0	0	170	0
Stage 1	169	-	-	-	-	-
Stage 2	89	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	735	880	-	-	1420	-
Stage 1	866	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	734	880	-	-	1420	-
Mov Cap-2 Maneuver	743	-	-	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	822	1420	-
HCM Lane V/C Ratio	-	-	0.017	0.002	-
HCM Control Delay (s)	-	-	9.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	56	3	10	101	72	12
Future Vol, veh/h	56	3	10	101	72	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	61	3	11	110	78	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	217	85	91	0	-	0
Stage 1	85	-	-	-	-	-
Stage 2	132	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	776	980	1517	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	899	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	980	1517	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	892	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1517	-	777	-	-
HCM Lane V/C Ratio	0.007	-	0.083	-	-
HCM Control Delay (s)	7.4	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	21	5	74	68	7
Future Vol, veh/h	36	21	5	74	68	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	39	23	5	80	74	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	169	78	82	0	-	0
Stage 1	78	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	826	988	1528	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	824	988	1528	-	-	-
Mov Cap-2 Maneuver	806	-	-	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	935	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1528	-	865	-	-
HCM Lane V/C Ratio	0.004	-	0.072	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	44	14	3	35	79	11
Future Vol, veh/h	44	14	3	35	79	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	48	15	3	38	86	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	137	92	98	0	-	0
Stage 1	92	-	-	-	-	-
Stage 2	45	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	861	971	1508	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	859	971	1508	-	-	-
Mov Cap-2 Maneuver	828	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	981	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1508	-	859	-	-
HCM Lane V/C Ratio	0.002	-	0.073	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	9	2	21	88	4
Future Vol, veh/h	17	9	2	21	88	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	18	10	2	23	96	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	125	98	100	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	27	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	875	963	1505	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	874	963	1505	-	-	-
Mov Cap-2 Maneuver	834	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	1000	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1505	-	875	-	-
HCM Lane V/C Ratio	0.001	-	0.032	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	403	207	4	16	81
Future Vol, veh/h	20	403	207	4	16	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	22	438	225	4	17	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	225	0	-	0	707	225
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	482	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1356	-	-	-	405	819
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	625	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1356	-	-	-	398	819
Mov Cap-2 Maneuver	-	-	-	-	553	-
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	615	-

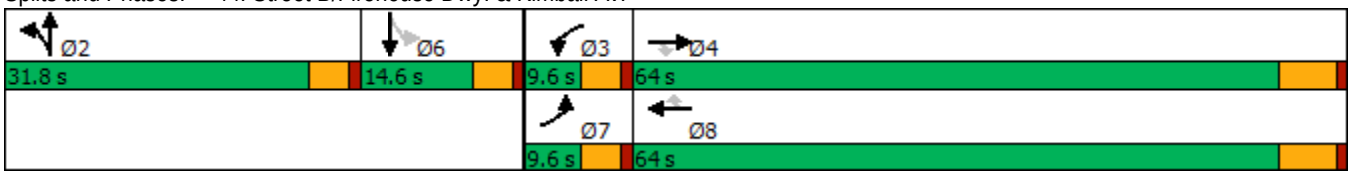
Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1356	-	-	-	553	819
HCM Lane V/C Ratio	0.016	-	-	-	0.031	0.108
HCM Control Delay (s)	7.7	-	-	-	11.7	9.9
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.4

Lane Group	EBT	EBR	WBL	WBT	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	1216	23	8	885	0		
Future Volume (vph)	1216	23	8	885	0		
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		3	8	2	6	7
Permitted Phases		4					
Detector Phase	4	4	3	8	2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	23.2	23.2	9.6	16.2	31.6	14.6	9.6
Total Split (s)	64.0	64.0	9.6	64.0	31.8	14.6	9.6
Total Split (%)	53.3%	53.3%	8.0%	53.3%	26.5%	12%	8%
Yellow Time (s)	5.2	5.2	3.6	5.2	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.2	6.2	4.6	6.2	4.6		
Lead/Lag	Lag	Lag	Lead	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	Min	Min	None
Act Effct Green (s)	58.4	58.4	5.0	60.0	12.9		
Actuated g/C Ratio	0.59	0.59	0.05	0.61	0.13		
v/c Ratio	0.60	0.02	0.09	0.85	0.41		
Control Delay	15.7	0.0	51.5	26.0	14.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	15.7	0.0	51.5	26.0	14.8		
LOS	B	A	D	C	B		
Approach Delay	15.4			26.2	14.8		
Approach LOS	B			C	B		

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 98.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 19.7	Intersection LOS: B
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1216	23	8	885	0	96	0	35	0	0	0
Future Volume (veh/h)	0	1216	23	8	885	0	96	0	35	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	1280	24	8	932	0	101	0	37	0	0	0
Adj No. of Lanes	1	2	1	1	1	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	1848	785	17	1098	933	228	0	83	0	3	0
Arrive On Green	0.00	0.51	0.51	0.01	0.61	0.00	0.19	0.00	0.19	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	1800	1530	1215	0	445	0	1800	0
Grp Volume(v), veh/h	0	1280	24	8	932	0	138	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1661	0	0	0	1800	0
Q Serve(g_s), s	0.0	14.3	0.4	0.3	22.3	0.0	3.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	14.3	0.4	0.3	22.3	0.0	3.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.73		0.27	0.00		0.00
Lane Grp Cap(c), veh/h	3	1848	785	17	1098	933	311	0	0	0	3	0
V/C Ratio(X)	0.00	0.69	0.03	0.47	0.85	0.00	0.44	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	152	3901	1658	152	1951	1658	847	0	0	0	337	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.8	6.4	26.2	8.4	0.0	19.2	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	7.4	1.9	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.1	0.2	0.2	11.5	0.0	1.9	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	10.3	6.4	33.6	10.3	0.0	20.2	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		B	A	C	B		C					
Approach Vol, veh/h		1304			940			138			0	
Approach Delay, s/veh		10.2			10.5			20.2			0.0	
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.6	5.2	33.6		0.0	0.0	38.7
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		27.2	5.0	57.8		10.0	5.0	57.8
Max Q Clear Time (g_c+I1), s		5.9	2.3	16.3		0.0	0.0	24.3
Green Ext Time (p_c), s		0.7	0.0	11.1		0.0	0.0	7.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	5.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	85	51	0	21	12
Future Vol, veh/h	0	85	51	0	21	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	92	55	0	23	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	114	55	0	0	55	0
Stage 1	55	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	887	1018	-	-	1563	-
Stage 1	973	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	874	1018	-	-	1563	-
Mov Cap-2 Maneuver	874	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	4.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1018	1563	-
HCM Lane V/C Ratio	-	-	0.091	0.015	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1174	89	27	841	38	20
Future Vol, veh/h	1174	89	27	841	38	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1262	96	29	904	41	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1358	0	2272	679
Stage 1	-	-	-	-	1310	-
Stage 2	-	-	-	-	962	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	513	-	~ 40	399
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	374	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	513	-	~ 38	399
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	353	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	25.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	179	399	-	-	513	-
HCM Lane V/C Ratio	0.228	0.054	-	-	0.057	-
HCM Control Delay (s)	31	14.5	-	-	12.4	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.8	0.2	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1060	39	786	82	22
Future Volume (vph)	1060	39	786	82	22
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.6	5.2	27.9	10.4	10.4
Actuated g/C Ratio	0.49	0.10	0.56	0.21	0.21
v/c Ratio	0.75	0.24	0.82	0.26	0.07
Control Delay	14.0	28.4	16.5	22.5	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	28.4	16.5	22.5	11.0
LOS	B	C	B	C	B
Approach Delay	14.0		17.0	20.1	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 50	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 61.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1060	134	39	786	82	22
Future Volume (veh/h)	1060	134	39	786	82	22
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1116	141	41	827	86	21
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1469	185	69	1096	299	282
Arrive On Green	0.48	0.48	0.04	0.61	0.18	0.18
Sat Flow, veh/h	3135	384	1619	1800	1619	1530
Grp Volume(v), veh/h	626	631	41	827	86	21
Grp Sat Flow(s),veh/h/ln	1710	1719	1619	1800	1619	1530
Q Serve(g_s), s	16.3	16.4	1.4	18.2	2.5	0.6
Cycle Q Clear(g_c), s	16.3	16.4	1.4	18.2	2.5	0.6
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	825	829	69	1096	299	282
V/C Ratio(X)	0.76	0.76	0.60	0.75	0.29	0.07
Avail Cap(c_a), veh/h	903	908	151	1270	299	282
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	11.6	25.7	7.7	19.2	18.4
Incr Delay (d2), s/veh	3.4	3.5	3.1	2.2	2.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	8.5	0.7	9.4	1.3	0.3
LnGrp Delay(d),s/veh	15.0	15.1	28.8	10.0	21.6	19.0
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1257			868	107	
Approach Delay, s/veh	15.0			10.9	21.1	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.9	32.6				39.5		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	3.4	18.4				20.2		4.5
Green Ext Time (p_c), s	0.0	8.0				12.3		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	992	47	746	78	31
Future Volume (vph)	992	47	746	78	31
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.3	5.7	29.7	10.5	10.5
Actuated g/C Ratio	0.47	0.11	0.58	0.20	0.20
v/c Ratio	0.76	0.29	0.77	0.26	0.10
Control Delay	15.5	29.3	13.4	23.6	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	29.3	13.4	23.6	16.0
LOS	B	C	B	C	B
Approach Delay	15.5		14.4	21.5	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 58.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	992	127	47	746	78	31
Future Volume (veh/h)	992	127	47	746	78	31
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1067	137	51	802	84	27
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1449	186	80	1102	302	285
Arrive On Green	0.48	0.48	0.05	0.61	0.19	0.19
Sat Flow, veh/h	3130	390	1619	1800	1619	1530
Grp Volume(v), veh/h	599	605	51	802	84	27
Grp Sat Flow(s),veh/h/ln	1710	1720	1619	1800	1619	1530
Q Serve(g_s), s	15.1	15.2	1.7	16.7	2.4	0.8
Cycle Q Clear(g_c), s	15.1	15.2	1.7	16.7	2.4	0.8
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	815	820	80	1102	302	285
V/C Ratio(X)	0.74	0.74	0.63	0.73	0.28	0.09
Avail Cap(c_a), veh/h	916	921	178	1316	302	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	11.3	25.0	7.3	18.7	18.1
Incr Delay (d2), s/veh	2.8	2.8	3.1	1.7	2.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	7.7	0.8	8.5	1.3	0.4
LnGrp Delay(d),s/veh	14.1	14.1	28.1	9.0	21.0	18.7
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1204			853	111	
Approach Delay, s/veh	14.1			10.1	20.4	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.3	31.7				39.0		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.7	17.2				18.7		4.4
Green Ext Time (p_c), s	0.0	8.3				12.7		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	55.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	289	688	46	14	417	89	25	6	10	75	18	352
Future Vol, veh/h	289	688	46	14	417	89	25	6	10	75	18	352
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	307	732	49	15	444	95	27	6	11	80	19	374

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	538	0	0	785	0	0	2093	1943	394	1505	1921	491
Stage 1	-	-	-	-	-	-	1375	1375	-	521	521	-
Stage 2	-	-	-	-	-	-	718	568	-	984	1400	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1040	-	-	843	-	-	35	66	611	93	68	582
Stage 1	-	-	-	-	-	-	156	215	-	542	535	-
Stage 2	-	-	-	-	-	-	423	510	-	270	209	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1040	-	-	843	-	-	~ 8	46	609	~ 66	47	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	236	98	-	129	109	-
Stage 1	-	-	-	-	-	-	110	151	-	382	525	-
Stage 2	-	-	-	-	-	-	143	501	-	179	147	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	0.3	25	244.5
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	223	1040	-	-	843	-	-	329
HCM Lane V/C Ratio	0.196	0.296	-	-	0.018	-	-	1.439
HCM Control Delay (s)	25	9.9	-	-	9.3	-	-	244.5
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.7	1.2	-	-	0.1	-	-	25.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	702	41	19	424	2	24	0	12	11	0	71
Future Vol, veh/h	30	702	41	19	424	2	24	0	12	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	798	47	22	482	2	27	0	14	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	484	0	0	844	0	0	1451	1413	422	990	1436	483
Stage 1	-	-	-	-	-	-	886	886	-	526	526	-
Stage 2	-	-	-	-	-	-	565	527	-	464	910	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1089	-	-	801	-	-	101	139	586	215	135	588
Stage 1	-	-	-	-	-	-	310	365	-	539	532	-
Stage 2	-	-	-	-	-	-	513	532	-	553	356	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1089	-	-	801	-	-	84	131	586	201	127	588
Mov Cap-2 Maneuver	-	-	-	-	-	-	241	294	-	201	127	-
Stage 1	-	-	-	-	-	-	301	354	-	523	517	-
Stage 2	-	-	-	-	-	-	433	517	-	524	345	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	18.9	14.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	300	1089	-	-	801	-	-	467
HCM Lane V/C Ratio	0.136	0.03	-	-	0.027	-	-	0.191
HCM Control Delay (s)	18.9	8.4	-	-	9.6	-	-	14.5
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	0.7

Intersection	
Intersection Delay, s/veh	25.4
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	345	0	380	0	0	0	0	0	195	156	0
Future Vol, veh/h	0	345	0	380	0	0	0	0	0	195	156	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	371	0	409	0	0	0	0	0	210	168	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	30.7	17.1
HCM LOS	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	195	156	345	380	328	202
LT Vol	195	0	345	0	0	0
Through Vol	0	156	0	0	328	0
RT Vol	0	0	0	380	0	202
Lane Flow Rate	210	168	371	409	353	217
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.487	0.365	0.805	0.748	0.742	0.414
Departure Headway (Hd)	8.353	7.837	7.81	6.586	7.575	6.854
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	432	460	467	552	480	526
Service Time	6.095	5.578	5.51	4.286	5.311	4.591
HCM Lane V/C Ratio	0.486	0.365	0.794	0.741	0.735	0.413
HCM Control Delay	18.8	15	35.6	26.3	29.1	14.4
HCM Lane LOS	C	B	E	D	D	B
HCM 95th-tile Q	2.6	1.6	7.4	6.5	6.1	2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	328	202
Future Vol, veh/h	0	0	328	202
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	353	217
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	23.5
HCM LOS	C

APPENDIX 7.3:

OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

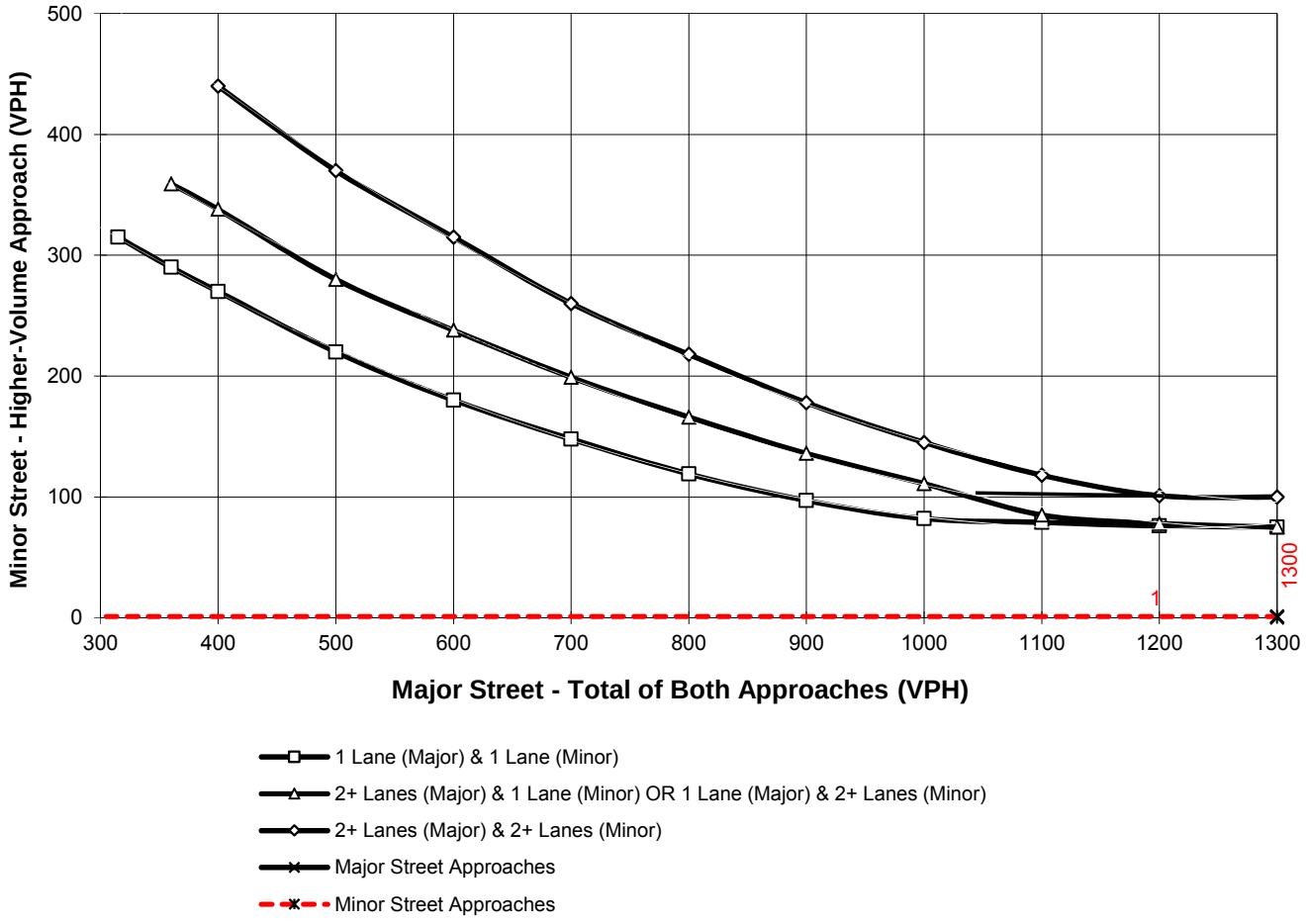
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **2019 Without Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.**
Total of Both Approaches (VPH) = **2338**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Fire Station Dwy.**
High Volume Approach (VPH) = **1**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 7.4:

OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2019 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 5				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **2,402** vpd

Minor Street Future ADT = **185** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,402**	*1* **185**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,402**	*1* **185**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 8% **B** 15%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2019 WP
				CALC CHS	DATE	06/13/17
Jurisdiction: City of Chino				CHK CHS	DATE	06/13/17
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 6				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,186** vpd Minor Street Future ADT = **124** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,186**	*1* **124**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,186**	*1* **124**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 5% **B** 10%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2019 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 7				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,078** vpd Minor Street Future ADT = **77** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,078**	1 **77**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,078**	1 **77**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 3% **B** 6%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2019 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 8				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,886** vpd

Minor Street Future ADT = **425** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,886**	*1* **425**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,886**	*1* **425**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 18% **B** 16%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2019 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 9				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,646** vpd Minor Street Future ADT = **313** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,646**	*1* **313**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,646**	*1* **313**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 13% **B** 14%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2019 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 10				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,406** vpd Minor Street Future ADT = **336** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,406**	*1* **336**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,406**	*1* **336**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied	2 CONDITIONS 80%		2 CONDITIONS 80%	
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 14% **B** 12%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2019 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 11				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,180** vpd

Minor Street Future ADT = **152** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,180**	*1* **152**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,180**	*1* **152**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 6% **B** 10%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2019 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Bickmore Av.				Critical Approach Speed (Major)		40 mph
Minor Street:	Mayhew Av.				Critical Approach Speed (Minor)		35 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **8,239** vpd

Minor Street Future ADT = **565** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Number of lanes for moving traffic on each approach		Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Major Street	Minor Street	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume						
Satisfied: XX	1 **8,239**	1 **565**	8,000 *	5,600	2,400	1,680
Not Satisfied: XX	2 +	1	9,600	6,720	2,400	1,680
	2 +	2 +	9,600	6,720	3,200	2,240
	1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic						
Satisfied			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Not Satisfied: XX	Major Street	Minor Street	Urban	Rural	Urban	Rural
	1 **8,239**	1 **565**	12,000	8,400	1,200	850
	2 +	1	14,400	10,080	1,200	850
	2 +	2 +	14,400	10,080	1,600	1,120
	1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B						
Satisfied						
Not Satisfied: XX			2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 24%	**B** 47%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

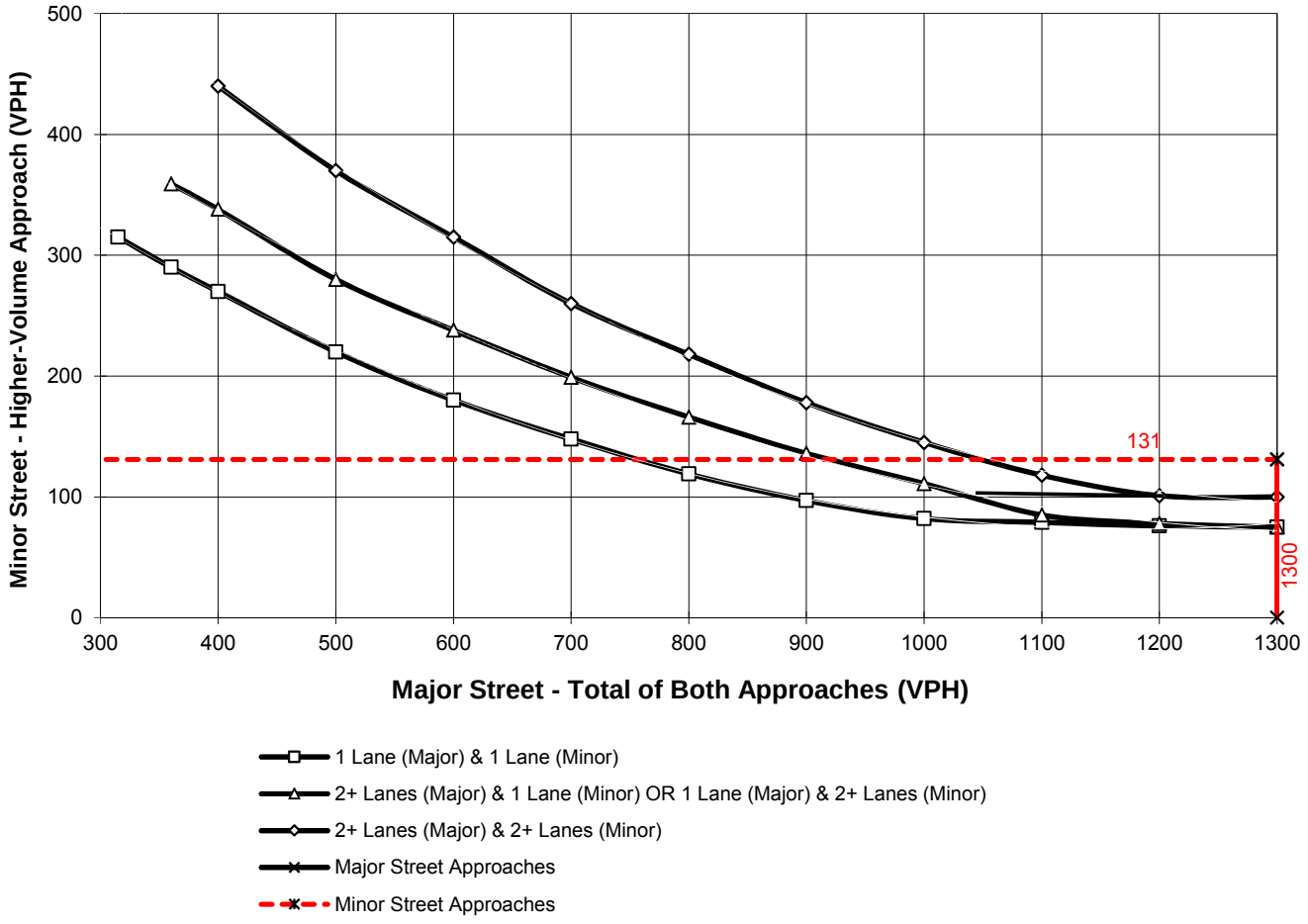
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **2019 With Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **2132**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Street B/Fire Station Dwy.** High Volume Approach (VPH) = **131**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 7.5:

OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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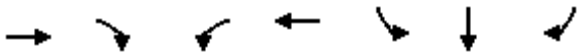


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1281	333	6	1012	311	314	420
v/c Ratio	0.44	0.37	0.04	0.58	0.61	0.57	0.71
Control Delay	11.7	3.2	27.7	9.6	22.8	21.4	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	3.2	27.7	9.6	22.8	21.4	20.8
Queue Length 50th (ft)	76	0	3	106	96	96	92
Queue Length 95th (ft)	141	46	m4	m117	174	171	#216
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	892	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.37	0.04	0.58	0.61	0.57	0.71

Intersection Summary

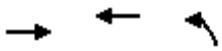
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	600	1256	637	363	206	421
v/c Ratio	1.02	0.54	0.48	0.54	1.20	1.13
Control Delay	70.2	6.0	15.1	11.6	164.6	114.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.2	6.0	15.1	11.6	164.6	114.4
Queue Length 50th (ft)	~128	68	87	54	~103	~100
Queue Length 95th (ft)	#216	159	128	124	#226	#185
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	589	2308	1339	677	171	374
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.54	0.48	0.54	1.20	1.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

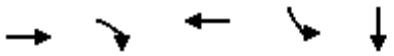
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2417	1077	589
v/c Ratio	0.89dr	0.34	1.20dr
Control Delay	9.2	8.3	38.2
Queue Delay	0.0	0.0	0.0
Total Delay	9.2	8.3	38.2
Queue Length 50th (ft)	177	92	156
Queue Length 95th (ft)	230	128	174
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3057	3153	1164
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.79	0.34	0.51

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1787	92	1262	633	582
v/c Ratio	0.79	0.12	0.56	0.92	0.84
Control Delay	24.3	4.0	13.0	43.3	31.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	4.0	13.0	43.3	31.7
Queue Length 50th (ft)	320	0	97	324	260
Queue Length 95th (ft)	312	20	99	393	324
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2269	737	2247	731	736
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.79	0.12	0.56	0.87	0.79

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	424	420	373	494	1056	1133	526
v/c Ratio	1.08	1.05	0.82	1.35	0.49	0.95	0.62
Control Delay	103.3	93.8	38.3	187.4	21.9	45.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	2.8	1.4	0.0
Total Delay	103.3	93.8	38.3	187.4	24.7	46.9	5.7
Queue Length 50th (ft)	~286	~286	149	~373	315	325	0
Queue Length 95th (ft)	#475	#489	#310	m#416	m326	#463	71
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	455	367	2147	1197	850
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	17	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.05	0.82	1.35	0.88	0.96	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	329	691	1167	690	324	1588
v/c Ratio	0.80	1.54	0.97	0.73	0.91	0.75
Control Delay	47.7	280.1	50.9	7.6	48.6	5.9
Queue Delay	7.0	1.0	0.0	0.0	0.0	3.4
Total Delay	54.7	281.1	50.9	7.6	48.6	9.3
Queue Length 50th (ft)	184	~556	~350	10	148	87
Queue Length 95th (ft)	#329	#784	#497	116	m154	m88
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	448	1198	951	376	2109
Starvation Cap Reductn	0	0	0	0	0	414
Spillback Cap Reductn	49	47	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.91	1.72	0.97	0.73	0.86	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	571	319	627	1281	76	968
v/c Ratio	0.58	0.48	1.09	0.57	0.08	1.10
Control Delay	61.1	25.7	86.6	1.1	32.3	78.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.1	25.7	86.6	1.1	32.3	78.4
Queue Length 50th (ft)	241	112	~560	7	22	~480
Queue Length 95th (ft)	m253	m116	m#549	m7	42	#734
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	983	667	577	2237	925	877
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.48	1.09	0.57	0.08	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

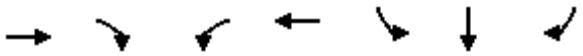
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	918	444	270	69	336	164	163	41
v/c Ratio	1.09	0.91	0.13	0.93	0.82	0.68	0.63	0.11
Control Delay	102.5	65.6	3.6	144.5	22.9	60.8	57.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.5	65.6	3.6	144.5	22.9	60.8	57.2	0.6
Queue Length 50th (ft)	~423	323	10	54	0	128	127	0
Queue Length 95th (ft)	#555	#628	17	#150	#144	186	183	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	839	487	2015	74	409	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.91	0.13	0.93	0.82	0.44	0.41	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1244	738	19	1025	344	356	744
v/c Ratio	0.42	0.76	0.14	0.59	0.67	0.63	1.27
Control Delay	11.6	12.2	37.3	9.5	25.3	23.0	153.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	12.2	37.3	9.5	25.3	23.0	153.3
Queue Length 50th (ft)	73	48	8	81	110	112	~322
Queue Length 95th (ft)	136	#303	m13	102	#203	195	#514
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	973	134	1738	511	562	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.76	0.14	0.59	0.67	0.63	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

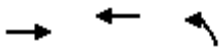
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	451	1277	682	633	193	314
v/c Ratio	0.84	0.60	0.56	0.92	0.79	0.59
Control Delay	39.1	9.5	17.6	33.8	49.7	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	9.5	17.6	33.8	49.7	28.2
Queue Length 50th (ft)	78	62	101	140	74	58
Queue Length 95th (ft)	#156	298	148	#343	#180	96
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1226	689	245	530
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.60	0.56	0.92	0.79	0.59

Intersection Summary

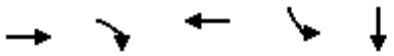
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1787	959	535
v/c Ratio	0.52	0.27	1.06dr
Control Delay	5.6	6.9	52.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.6	6.9	52.2
Queue Length 50th (ft)	129	87	188
Queue Length 95th (ft)	206	130	235
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3406	3493	1001
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.52	0.27	0.53

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	737	91	1083	880	903
v/c Ratio	0.57	0.20	0.83	0.86	0.91
Control Delay	40.8	8.1	43.8	25.3	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	8.1	43.8	25.3	30.6
Queue Length 50th (ft)	184	0	273	491	538
Queue Length 95th (ft)	228	41	331	749	#933
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1288	459	1298	1041	1007
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.57	0.20	0.83	0.85	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	391	382	351	556	1131	996	578
v/c Ratio	0.92	0.89	0.77	1.58	0.54	0.86	0.66
Control Delay	61.0	53.3	34.6	289.4	23.0	36.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	3.3	0.0	0.0
Total Delay	61.0	53.3	34.6	289.4	26.3	36.9	6.1
Queue Length 50th (ft)	222	214	144	~473	350	274	0
Queue Length 95th (ft)	#396	#390	#280	m#476	m334	#385	78
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	450	475	352	2076	1159	879
Starvation Cap Reductn	0	0	0	0	822	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.85	0.74	1.58	0.90	0.86	0.66

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	360	605	1236	773	319	1299
v/c Ratio	0.85	1.34	1.06	0.82	0.90	0.63
Control Delay	50.5	196.5	74.5	13.0	52.3	5.3
Queue Delay	30.3	1.8	0.0	0.0	0.0	1.0
Total Delay	80.9	198.3	74.5	13.0	52.3	6.2
Queue Length 50th (ft)	203	~453	~424	42	129	60
Queue Length 95th (ft)	#362	#672	#554	#304	m183	m86
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	450	1166	944	376	2071
Starvation Cap Reductn	0	0	0	0	0	467
Spillback Cap Reductn	79	76	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.62	1.06	0.82	0.85	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	936	201	351	1263	172	1524
v/c Ratio	0.70	0.28	0.84	0.56	0.19	1.83
Control Delay	37.4	10.2	61.9	3.3	34.4	396.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	10.2	61.9	3.3	34.4	396.9
Queue Length 50th (ft)	404	39	231	33	53	~1454
Queue Length 95th (ft)	#482	m98	m220	m47	82	#1723
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1332	713	562	2265	898	833
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.28	0.62	0.56	0.19	1.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	378	106	246	32	16	460	470	164
v/c Ratio	0.37	0.68	0.16	0.37	0.08	0.84	0.80	0.25
Control Delay	37.0	68.4	11.8	66.7	0.9	49.8	45.1	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	68.4	11.8	66.7	0.9	49.8	45.1	4.3
Queue Length 50th (ft)	130	67	38	24	0	333	333	0
Queue Length 95th (ft)	188	#149	60	59	0	449	443	41
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1012	172	1497	91	190	632	682	727
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.62	0.16	0.35	0.08	0.73	0.69	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 7.6:

OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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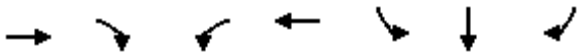


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1287	333	6	1013	323	332	420
v/c Ratio	0.44	0.37	0.04	0.58	0.63	0.60	0.71
Control Delay	11.7	3.2	28.7	9.6	23.5	22.3	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	3.2	28.7	9.6	23.5	22.3	20.8
Queue Length 50th (ft)	77	0	3	106	102	103	92
Queue Length 95th (ft)	142	46	m4	m117	183	182	#216
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	892	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.37	0.04	0.58	0.63	0.60	0.71

Intersection Summary

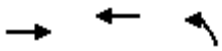
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	600	1292	638	369	206	421
v/c Ratio	1.11	0.56	0.46	0.53	1.20	1.13
Control Delay	100.1	6.1	14.2	11.1	164.6	114.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.1	6.1	14.2	11.1	164.6	114.4
Queue Length 50th (ft)	~139	71	84	54	~103	~100
Queue Length 95th (ft)	#225	166	124	123	#226	#185
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2308	1396	700	171	374
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.56	0.46	0.53	1.20	1.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

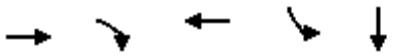
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2478	1078	589
v/c Ratio	0.88dr	0.34	1.21dr
Control Delay	9.2	8.1	38.9
Queue Delay	0.0	0.0	0.0
Total Delay	9.2	8.1	38.9
Queue Length 50th (ft)	179	90	155
Queue Length 95th (ft)	238	125	175
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3093	3178	1009
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.80	0.34	0.58

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1794	92	1263	665	608
v/c Ratio	0.81	0.13	0.58	0.94	0.85
Control Delay	25.4	4.0	13.8	46.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	4.0	13.8	46.7	32.6
Queue Length 50th (ft)	322	0	126	352	280
Queue Length 95th (ft)	315	20	99	#432	346
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2215	722	2196	731	739
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.81	0.13	0.58	0.91	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	453	446	373	502	1058	1142	526
v/c Ratio	1.16	1.12	0.82	1.37	0.49	0.95	0.62
Control Delay	128.1	114.2	38.3	196.5	22.0	46.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	2.8	2.5	0.0
Total Delay	128.1	114.2	38.3	196.5	24.8	49.2	5.7
Queue Length 50th (ft)	~323	~321	149	~383	317	328	0
Queue Length 95th (ft)	#516	#527	#310	m#422	m324	#469	71
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	455	367	2147	1197	850
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	24	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	1.12	0.82	1.37	0.88	0.97	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	329	735	1177	701	324	1651
v/c Ratio	0.80	1.64	0.98	0.74	0.91	0.78
Control Delay	47.7	322.6	52.7	8.2	43.5	6.2
Queue Delay	7.6	1.1	0.0	0.0	0.0	6.0
Total Delay	55.3	323.7	52.7	8.2	43.5	12.3
Queue Length 50th (ft)	184	~612	~359	14	150	94
Queue Length 95th (ft)	#329	#844	#504	128	m149	m92
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	448	1198	951	376	2109
Starvation Cap Reductn	0	0	0	0	0	409
Spillback Cap Reductn	51	49	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	1.84	0.98	0.74	0.86	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	576	319	627	1297	76	1040
v/c Ratio	0.57	0.47	1.12	0.58	0.08	1.20
Control Delay	60.3	25.4	96.7	1.1	32.3	117.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	25.4	96.7	1.1	32.3	117.5
Queue Length 50th (ft)	242	110	~563	7	22	~612
Queue Length 95th (ft)	m257	m115	m#541	m7	42	#871
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1011	677	562	2237	925	868
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.47	1.12	0.58	0.08	1.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

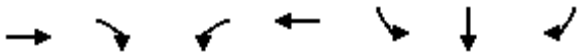
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	923	444	271	69	336	164	163	41
v/c Ratio	1.08	0.93	0.13	0.93	0.82	0.68	0.63	0.11
Control Delay	97.7	67.3	3.6	144.5	22.9	60.8	57.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.7	67.3	3.6	144.5	22.9	60.8	57.2	0.6
Queue Length 50th (ft)	~421	317	10	54	0	128	127	0
Queue Length 95th (ft)	#554	#626	16	#150	#144	186	183	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	854	480	2015	74	409	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.93	0.13	0.93	0.82	0.44	0.41	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1245	738	19	1031	346	362	744
v/c Ratio	0.42	0.76	0.14	0.59	0.68	0.65	1.27
Control Delay	11.6	12.2	37.7	9.5	25.5	23.4	153.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	12.2	37.7	9.5	25.5	23.4	153.3
Queue Length 50th (ft)	74	48	8	81	111	114	~322
Queue Length 95th (ft)	137	#303	m13	102	#206	200	#514
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	973	134	1738	511	561	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.76	0.14	0.59	0.68	0.65	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

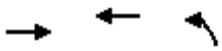
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	451	1287	687	666	193	314
v/c Ratio	0.84	0.60	0.56	0.97	0.79	0.59
Control Delay	39.0	9.5	17.6	42.7	49.7	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	9.5	17.6	42.7	49.7	28.2
Queue Length 50th (ft)	78	62	102	158	74	58
Queue Length 95th (ft)	#155	301	149	#373	#180	96
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1226	689	245	530
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.60	0.56	0.97	0.79	0.59

Intersection Summary

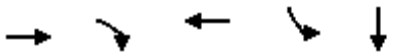
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1801	964	535
v/c Ratio	0.53	0.28	1.06dr
Control Delay	5.6	6.9	52.3
Queue Delay	0.0	0.0	0.0
Total Delay	5.6	6.9	52.3
Queue Length 50th (ft)	131	87	189
Queue Length 95th (ft)	210	131	236
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3403	3491	1000
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.53	0.28	0.54

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	738	91	1088	890	904
v/c Ratio	0.57	0.20	0.84	0.86	0.91
Control Delay	40.8	8.1	44.1	26.1	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	8.1	44.1	26.1	30.7
Queue Length 50th (ft)	184	0	276	504	541
Queue Length 95th (ft)	229	41	334	#777	#935
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1287	459	1297	1041	1007
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.57	0.20	0.84	0.85	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	392	390	355	600	1139	998	578
v/c Ratio	0.92	0.90	0.78	1.70	0.55	0.86	0.66
Control Delay	61.4	55.9	35.3	342.4	23.1	37.0	6.1
Queue Delay	0.0	0.0	0.0	0.0	3.6	0.0	0.0
Total Delay	61.4	55.9	35.3	342.4	26.7	37.0	6.1
Queue Length 50th (ft)	223	220	147	~527	355	275	0
Queue Length 95th (ft)	#397	#402	#286	m#508	m325	#386	78
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	451	475	352	2076	1159	879
Starvation Cap Reductn	0	0	0	0	823	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.86	0.75	1.70	0.91	0.86	0.66

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	360	615	1287	828	319	1314
v/c Ratio	0.85	1.37	1.10	0.88	0.90	0.63
Control Delay	50.5	207.1	89.8	18.2	52.3	5.4
Queue Delay	36.4	1.9	0.0	0.0	0.0	1.0
Total Delay	86.9	209.1	89.8	18.2	52.3	6.4
Queue Length 50th (ft)	203	~468	~456	73	130	63
Queue Length 95th (ft)	#362	#688	#587	#375	m181	m88
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	449	1166	944	376	2071
Starvation Cap Reductn	0	0	0	0	0	462
Spillback Cap Reductn	85	82	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.06	1.68	1.10	0.88	0.85	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	937	201	351	1348	172	1543
v/c Ratio	0.69	0.27	0.88	0.60	0.19	1.99
Control Delay	35.9	9.0	68.3	3.9	34.4	467.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	9.0	68.3	3.9	34.4	467.2
Queue Length 50th (ft)	404	37	230	34	53	~1579
Queue Length 95th (ft)	474	m78	m245	m68	82	#1848
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1364	731	477	2265	898	777
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.27	0.74	0.60	0.19	1.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	379	106	253	32	16	460	470	164
v/c Ratio	0.37	0.68	0.17	0.37	0.08	0.84	0.80	0.25
Control Delay	37.0	69.6	11.2	66.7	0.9	49.8	45.1	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	69.6	11.2	66.7	0.9	49.8	45.1	4.3
Queue Length 50th (ft)	130	67	39	24	0	333	333	0
Queue Length 95th (ft)	188	m#147	58	59	0	449	443	41
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1012	172	1497	91	190	632	682	727
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.62	0.17	0.35	0.08	0.73	0.69	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 7.7:

OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4085*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1510*	pc/h/ln
S	*68.9*	mph
D = v_p / S	*21.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3166*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1164*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3795*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1402*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4409*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2432*	pc/h/ln
S	*52.4*	mph
D = v_p / S	*46.4*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4490*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1667*	pc/h/ln
S	*67.5*	mph
D = v_p / S	*24.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3439*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1271*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6162*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2367*	pc/h/ln
S	*54.2*	mph
D = v_p / S	*43.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4571*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1789*	pc/h/ln
S	*66.0*	mph
D = v_p / S	*27.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6879*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1897*	pc/h/ln
S	*64.4*	mph
D = v_p / S	*29.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2018) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6982*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1935*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7045*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1981*	pc/h/ln
S	*62.9*	mph
D = v_p / S	*31.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7065*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1977*	pc/h/ln
S	*63.0*	mph
D = v_p / S	*31.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3675*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1358*	pc/h/ln
S	*69.7*	mph
D = v_p / S	*19.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2348*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*863*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3728*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1371*	pc/h/ln
S	*69.7*	mph
D = v_p / S	*19.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3637*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2006*	pc/h/ln
S	*62.5*	mph
D = v_p / S	*32.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4464*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1658*	pc/h/ln
S	*67.6*	mph
D = v_p / S	*24.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3411*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1267*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5553*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2102*	pc/h/ln
S	*60.6*	mph
D = v_p / S	*34.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4731*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1817*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7165*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1986*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*31.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7228*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1994*	pc/h/ln
S	*62.7*	mph
D = v_p / S	*31.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6417*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1779*	pc/h/ln
S	*66.1*	mph
D = v_p / S	*26.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6498*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1810*	pc/h/ln
S	*65.7*	mph
D = v_p / S	*27.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 7.8:

OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4136*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1536*	pc/h/ln
S	*68.7*	mph
D = v_p / S	*22.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3197*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1176*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3826*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1414*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4419*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2438*	pc/h/ln
S	*52.2*	mph
D = v_p / S	*46.7*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4500*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1671*	pc/h/ln
S	*67.4*	mph
D = v_p / S	*24.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3445*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1273*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6168*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2369*	pc/h/ln
S	*54.1*	mph
D = v_p / S	*43.8*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4621*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1808*	pc/h/ln
S	*65.7*	mph
D = v_p / S	*27.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6883*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1898*	pc/h/ln
S	*64.3*	mph
D = v_p / S	*29.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7010*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1943*	pc/h/ln
S	*63.6*	mph
D = v_p / S	*30.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7067*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1988*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*31.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7070*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1979*	pc/h/ln
S	*63.0*	mph
D = v_p / S	*31.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3688*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1363*	pc/h/ln
S	*69.7*	mph
D = v_p / S	*19.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2356*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*866*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3736*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1374*	pc/h/ln
S	*69.6*	mph
D = v_p / S	*19.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3688*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2044*	pc/h/ln
S	*61.7*	mph
D = v_p / S	*33.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4516*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1677*	pc/h/ln
S	*67.4*	mph
D = v_p / S	*24.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3443*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1279*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5585*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2115*	pc/h/ln
S	*60.3*	mph
D = v_p / S	*35.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4743*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1822*	pc/h/ln
S	*65.5*	mph
D = v_p / S	*27.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7187*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1992*	pc/h/ln
S	*62.7*	mph
D = v_p / S	*31.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7235*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1996*	pc/h/ln
S	*62.7*	mph
D = v_p / S	*31.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6422*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1780*	pc/h/ln
S	*66.1*	mph
D = v_p / S	*26.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*6/13/2017*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2019) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6526*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1818*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 7.9:

OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 4085	
	Ramp Volume, V_R: 919	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4085	0.92	Level	4	0	0.980	1.00	4529
Ramp	919	0.92	Level	10	0	0.952	1.00	1049
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.599 using Equation (Exhibit 13-7)

V_{12} = 3132 pc/h

V_3 or V_{av34} 1397 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4529	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3480	Exhibit 13-8	7200	No
V_R	1049	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3132	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_S = 0.392 (Exhibit 13-12)

S_R = 59.0 mph (Exhibit 13-12)

S_0 = 75.2 mph

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	150
Freeway Volume, V_F	3795
Ramp Volume, V_R	832
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 985 ft
V_D = 179 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3795	0.92	Level	4	0	0.980	1.00	4207
Ramp	832	0.92	Level	12	0	0.943	1.00	959
UpStream								
DownStream	179	0.92	Level	19	0	0.913	1.00	213

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 0.611 using Equation (Exhibit 13-7)
V_{12} = 2943 pc/h
V_3 or V_{av34} 1264 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4207	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3248	Exhibit 13-8	7200	No
V_R	959	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2943	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 28.2 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)
S_R= 59.2 mph (Exhibit 13-12)
S_0= 75.8 mph (Exhibit 13-12)
S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 285 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3323	
	Ramp Volume, V_R: 544	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3323	0.92	Level	2	0	0.990	1.00	3648
Ramp	544	0.92	Level	15	0	0.930	1.00	636
UpStream	285	0.92	Level	11	0	0.948	1.00	327
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3648 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4284	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4284	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 35.6 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.580 (Exibit 13-11)

S_R= 53.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 53.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 542 veh/h
	Freeway Volume, V_F: 3323	
	Ramp Volume, V_R: 544	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3323	0.92	Level	2	0	0.990	1.00	3648
Ramp	544	0.92	Level	15	0	0.930	1.00	636
UpStream								
DownStream	542	0.92	Level	1	0	0.995	1.00	592

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3648 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4284	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4284	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 35.6 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.580 (Exibit 13-11)

S_R = 53.8 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 53.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3439	
	Ramp Volume, V_R: 1051	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3439	0.92	Level	4	0	0.980	1.00	3813
Ramp	1051	0.92	Level	6	0	0.971	1.00	1177
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2250 pc/h

V_3 or V_{av34} = 1563 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2250 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4990	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3427	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 28.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.401 (Exibit 13-11)

S_R = 58.8 mph (Exhibit 13-11)

S_0 = 66.2 mph (Exhibit 13-11)

S = 60.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	796 veh/h	Freeway Volume, V_F	5319	V_D =	veh/h
		Ramp Volume, V_R	843		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5319	0.92	Level	12	0	0.943	1.00	6128
Ramp	843	0.92	Level	9	0	0.957	1.00	958
UpStream	796	0.92	Level	2	0	0.990	1.00	874
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3625 pc/h

V_3 or V_{av34} = 2503 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3625 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7086	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4583	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 37.6 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.657 (Exibit 13-11)

S_R = 51.6 mph (Exhibit 13-11)

S_0 = 62.3 mph (Exhibit 13-11)

S = 54.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 862 veh/h
	Freeway Volume, V_F: 4571	
	Ramp Volume, V_R: 859	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4571	0.92	Level	16	0	0.926	1.00	5366
Ramp	859	0.92	Level	12	0	0.943	1.00	990
UpStream								
DownStream	862	0.92	Level	4	0	0.980	1.00	956

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.580 using Equation (Exhibit 13-7)

V_{12} = 3529 pc/h

V_3 or V_{av34} 1837 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5366	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4376	Exhibit 13-8	7200	No
V_R	990	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3529	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.387 (Exhibit 13-12)

S_R= 59.2 mph (Exhibit 13-12)

S_0= 73.5 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 874 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	6108
Ramp Volume, V_R	771
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6108	0.92	Level	1	0	0.995	1.00	6672
Ramp	771	0.92	Level	19	0	0.913	1.00	918
UpStream	874	0.92	Level	21	0	0.905	1.00	1050
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.103 using Equation (Exhibit 13-6)
V_{12} = 688 pc/h
V_3 or V_{av34} = 2992 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2668 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7590	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3586	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.3 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.394 (Exibit 13-11)
S_R = 59.0 mph (Exhibit 13-11)
S_0 = 64.6 mph (Exhibit 13-11)
S = 61.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 771 veh/h
	Freeway Volume, V_F: 6982	
	Ramp Volume, V_R: 874	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6982	0.92	Level	4	0	0.980	1.00	7741
Ramp	874	0.92	Level	21	0	0.905	1.00	1050
UpStream								
DownStream	771	0.92	Level	19	0	0.913	1.00	918

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3967 pc/h

V_3 or V_{av34} 1887 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7741	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6691	Exhibit 13-8	9600	No
V_R	1050	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3967	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.8 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.393 (Exhibit 13-12)

S_R = 59.0 mph (Exhibit 13-12)

S_0 = 73.3 mph (Exhibit 13-12)

S = 65.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 746 veh/h
	Freeway Volume, V_F: 7045	
	Ramp Volume, V_R: 726	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7045	0.92	Level	7	0	0.966	1.00	7926
Ramp	726	0.92	Level	26	0	0.885	1.00	892
UpStream								
DownStream	746	0.92	Level	19	0	0.913	1.00	888

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3959 pc/h

V_3 or V_{av34} 1983 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7926	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7034	Exhibit 13-8	9600	No
V_R	892	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3959	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.378 (Exhibit 13-12)

S_R = 59.4 mph (Exhibit 13-12)

S_0 = 73.0 mph (Exhibit 13-12)

S = 65.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 726 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	6319
Ramp Volume, V_R	746
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6319	0.92	Level	5	0	0.976	1.00	7040
Ramp	746	0.92	Level	19	0	0.913	1.00	888
UpStream	726	0.92	Level	26	0	0.885	1.00	892
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.107 using Equation (Exhibit 13-6)
V_{12} = 752 pc/h
V_3 or V_{av34} = 3144 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2816 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7928	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3704	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.8 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.434 (Exibit 13-11)
S_R = 57.8 mph (Exhibit 13-11)
S_0 = 64.2 mph (Exhibit 13-11)
S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 3675	
	Ramp Volume, V_R: 1327	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3675	0.92	Level	4	0	0.980	1.00	4074
Ramp	1327	0.92	Level	4	0	0.980	1.00	1471
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.590 using Equation (Exhibit 13-7)

V_{12} = 3008 pc/h

V_3 or V_{av34} 1066 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4074	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2603	Exhibit 13-8	7200	No
V_R	1471	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3008	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.430 (Exhibit 13-12)

S_R = 57.9 mph (Exhibit 13-12)

S_0 = 76.5 mph (Exhibit 13-12)

S = 61.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 985 ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = 345 veh/h
	Freeway Volume, V_F: 3728	
	Ramp Volume, V_R: 1663	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3728	0.92	Level	3	0	0.985	1.00	4113
Ramp	1663	0.92	Level	5	0	0.976	1.00	1853
UpStream								
DownStream	345	0.92	Level	3	0	0.985	1.00	381

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.572 using Equation (Exhibit 13-7)

V_{12} = 3146 pc/h

V_3 or V_{av34} 967 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4113	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2260	Exhibit 13-8	7200	No
V_R	1853	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3146	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.465 (Exhibit 13-12)

S_R= 57.0 mph (Exhibit 13-12)

S_0= 76.8 mph (Exhibit 13-12)

S = 60.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 1027 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2756	
	Ramp Volume, V_R: 812	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2756	0.92	Level	1	0	0.995	1.00	3011
Ramp	812	0.92	Level	12	0	0.943	1.00	936
UpStream	1027	0.92	Level	4	0	0.980	1.00	1139
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3011 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3947	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3947	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.499 (Exibit 13-11)

S_R = 56.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 56.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 69 veh/h
	Freeway Volume, V_F: 2756	
	Ramp Volume, V_R: 812	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2756	0.92	Level	1	0	0.995	1.00	3011
Ramp	812	0.92	Level	12	0	0.943	1.00	936
UpStream								
DownStream	69	0.92	Level	8	0	0.962	1.00	78

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3011 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3947	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3947	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.499 (Exibit 13-11)

S_R= 56.0 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 56.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3411	
	Ramp Volume, V_R: 1053	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3411	0.92	Level	5	0	0.976	1.00	3800
Ramp	1053	0.92	Level	4	0	0.980	1.00	1167
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2242 pc/h

V_3 or V_{av34} = 1558 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2242 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4967	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3409	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.398 (Exibit 13-11)

S_R = 58.8 mph (Exhibit 13-11)

S_0 = 66.2 mph (Exhibit 13-11)

S = 61.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	385 veh/h	Freeway Volume, V_F	4921	V_D =	veh/h
		Ramp Volume, V_R	631		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4921	0.92	Level	8	0	0.962	1.00	5563
Ramp	631	0.92	Level	14	0	0.935	1.00	734
UpStream	385	0.92	Level	2	0	0.990	1.00	423
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3291 pc/h

V_3 or V_{av34} 2272 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3291 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6297	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4025	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.494 (Exibit 13-11)

S_R= 56.2 mph (Exhibit 13-11)

S_0= 63.6 mph (Exhibit 13-11)

S = 58.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 1500 ft
V_u = veh/h	Deceleration Lane Length L_D: 0	V_D = 488 veh/h
	Freeway Volume, V_F: 4731	
	Ramp Volume, V_R: 1395	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4731	0.92	Level	12	0	0.943	1.00	5451
Ramp	1395	0.92	Level	9	0	0.957	1.00	1585
UpStream								
DownStream	488	0.92	Level	2	0	0.990	1.00	536

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.551 using Equation (Exhibit 13-7)

V_{12} = 3714 pc/h

V_3 or V_{av34} 1737 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5451	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3866	Exhibit 13-8	7200	No
V_R	1585	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3714	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.2 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.441 (Exhibit 13-12)

S_R= 57.7 mph (Exhibit 13-12)

S_0= 73.9 mph (Exhibit 13-12)

S = 62.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2200 ft
V_u = 940 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	6288
Ramp Volume, V_R	877
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6288	0.92	Level	2	0	0.990	1.00	6903
Ramp	877	0.92	Level	18	0	0.917	1.00	1039
UpStream	940	0.92	Level	11	0	0.948	1.00	1078
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.088 using Equation (Exhibit 13-6)
V_{12} = 607 pc/h
V_3 or V_{av34} = 3148 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2761 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7942	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3800	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.9 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.428 (Exibit 13-11)
S_R = 58.0 mph (Exhibit 13-11)
S_0 = 64.3 mph (Exhibit 13-11)
S = 61.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2200 ft
V_u = veh/h	Deceleration Lane Length L_D: 175	V_D = 877 veh/h
	Freeway Volume, V_F: 7228	
	Ramp Volume, V_R: 940	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7228	0.92	Level	3	0	0.985	1.00	7974
Ramp	940	0.92	Level	11	0	0.948	1.00	1078
UpStream								
DownStream	877	0.92	Level	18	0	0.917	1.00	1039

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4085 pc/h

V_3 or V_{av34} 1944 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7974	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6896	Exhibit 13-8	9600	No
V_R	1078	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4085	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.8 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.395 (Exhibit 13-12)

S_R = 58.9 mph (Exhibit 13-12)

S_0 = 73.1 mph (Exhibit 13-12)

S = 65.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	220
Freeway Volume, V_F	6417
Ramp Volume, V_R	786
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 2115 ft
V_D = 686 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6417	0.92	Level	4	0	0.980	1.00	7114
Ramp	786	0.92	Level	16	0	0.926	1.00	923
UpStream								
DownStream	686	0.92	Level	17	0	0.922	1.00	809

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 0.436 using Equation (Exhibit 13-7)
V_{12} = 3622 pc/h
V_3 or V_{av34} 1746 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7114	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6191	Exhibit 13-8	9600	No
V_R	923	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3622	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 33.4 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.381 (Exhibit 13-12)
S_R= 59.3 mph (Exhibit 13-12)
S_0= 73.9 mph (Exhibit 13-12)
S = 65.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 786 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5631
Ramp Volume, V_R	868
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5631	0.92	Level	3	0	0.985	1.00	6212
Ramp	868	0.92	Level	17	0	0.922	1.00	1024
UpStream	786	0.92	Level	16	0	0.926	1.00	923
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.090 using Equation (Exhibit 13-6)
V_{12} = 558 pc/h
V_3 or V_{av34} = 2827 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2484 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7236	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3508	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.2 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.406 (Exibit 13-11)
S_R = 58.6 mph (Exhibit 13-11)
S_0 = 65.1 mph (Exhibit 13-11)
S = 61.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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APPENDIX 7.10:

OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	4136	V_D =	veh/h
		Ramp Volume, V_R	939		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4136	0.92	Level	5	0	0.976	1.00	4608
Ramp	939	0.92	Level	11	0	0.948	1.00	1077
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.595 using Equation (Exhibit 13-7)

V_{12} = 3179 pc/h

V_3 or V_{av34} 1429 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4608	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3531	Exhibit 13-8	7200	No
V_R	1077	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3179	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.395 (Exhibit 13-12)

S_R = 58.9 mph (Exhibit 13-12)

S_0 = 75.1 mph (Exhibit 13-12)

S = 63.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3826	V_D =	179 veh/h
		Ramp Volume, V_R	863		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3826	0.92	Level	4	0	0.980	1.00	4242
Ramp	863	0.92	Level	13	0	0.939	1.00	999
UpStream								
DownStream	179	0.92	Level	19	0	0.913	1.00	213

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.608 using Equation (Exhibit 13-7)

V_{12} = 2971 pc/h

V_3 or V_{av34} 1271 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4242	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3243	Exhibit 13-8	7200	No
V_R	999	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2971	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.388 (Exhibit 13-12)

S_R = 59.1 mph (Exhibit 13-12)

S_0 = 75.7 mph (Exhibit 13-12)

S = 63.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 1460 ft
V_u = 285 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	475
Deceleration Lane Length L_D	
Freeway Volume, V_F	3323
Ramp Volume, V_R	554
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3323	0.92	Level	2	0	0.990	1.00	3648
Ramp	554	0.92	Level	15	0	0.930	1.00	647
UpStream	285	0.92	Level	11	0	0.948	1.00	327
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 3648 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4295	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4295	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
D_R = 35.7 (pc/mi/ln)
LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.583 (Exibit 13-11)
S_R= 53.7 mph (Exhibit 13-11)
S_0= N/A mph (Exhibit 13-11)
S = 53.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R= mph (Exhibit 13-12)
S_0= mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 542 veh/h
	Freeway Volume, V_F: 3323	
	Ramp Volume, V_R: 554	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3323	0.92	Level	2	0	0.990	1.00	3648
Ramp	554	0.92	Level	15	0	0.930	1.00	647
UpStream								
DownStream	542	0.92	Level	1	0	0.995	1.00	592

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3648 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4295	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4295	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 35.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.583 (Exibit 13-11)

S_R = 53.7 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 53.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3445	
	Ramp Volume, V_R: 1055	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3445	0.92	Level	4	0	0.980	1.00	3819
Ramp	1055	0.92	Level	6	0	0.971	1.00	1181
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2254 pc/h

V_3 or V_{av34} = 1565 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2254 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5000	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3435	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.402 (Exibit 13-11)

S_R = 58.8 mph (Exhibit 13-11)

S_0 = 66.2 mph (Exhibit 13-11)

S = 60.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	796 veh/h	Freeway Volume, V_F	5319	V_D =	veh/h
		Ramp Volume, V_R	849		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5319	0.92	Level	12	0	0.943	1.00	6128
Ramp	849	0.92	Level	10	0	0.952	1.00	969
UpStream	796	0.92	Level	2	0	0.990	1.00	874
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3625 pc/h

V_3 or V_{av34} = 2503 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3625 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7097	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4594	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 37.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.662 (Exibit 13-11)

S_R = 51.5 mph (Exhibit 13-11)

S_0 = 62.3 mph (Exhibit 13-11)

S = 54.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	4621	V_D =	862 veh/h
		Ramp Volume, V_R	909		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4621	0.92	Level	16	0	0.926	1.00	5425
Ramp	909	0.92	Level	13	0	0.939	1.00	1052
UpStream								
DownStream	862	0.92	Level	4	0	0.980	1.00	956

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.576 using Equation (Exhibit 13-7)

V_{12} = 3571 pc/h

V_3 or V_{av34} 1854 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5425	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4373	Exhibit 13-8	7200	No
V_R	1052	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3571	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.393 (Exhibit 13-12)

S_R = 59.0 mph (Exhibit 13-12)

S_0 = 73.5 mph (Exhibit 13-12)

S = 63.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	750	☑ No	☐ Off
L_{up} =	2200 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	902 veh/h	Freeway Volume, V_F	6108	V_D =	veh/h
		Ramp Volume, V_R	775		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6108	0.92	Level	1	0	0.995	1.00	6672
Ramp	775	0.92	Level	19	0	0.913	1.00	922
UpStream	902	0.92	Level	22	0	0.901	1.00	1088
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.103 using Equation (Exhibit 13-6)

V_{12} = 684 pc/h

V_3 or V_{av34} = 2994 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2668 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7594	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3590	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.395 (Exibit 13-11)

S_R = 58.9 mph (Exhibit 13-11)

S_0 = 64.6 mph (Exhibit 13-11)

S = 61.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	7010	V_D =	775 veh/h
		Ramp Volume, V_R	902		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7010	0.92	Level	4	0	0.980	1.00	7772
Ramp	902	0.92	Level	22	0	0.901	1.00	1088
UpStream								
DownStream	775	0.92	Level	19	0	0.913	1.00	922

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4002 pc/h

V_3 or V_{av34} 1885 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7772	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6684	Exhibit 13-8	9600	No
V_R	1088	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4002	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.396 (Exhibit 13-12)

S_R = 58.9 mph (Exhibit 13-12)

S_0 = 73.3 mph (Exhibit 13-12)

S = 65.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	7067	V_D =	751 veh/h
		Ramp Volume, V_R	748		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7067	0.92	Level	7	0	0.966	1.00	7950
Ramp	748	0.92	Level	28	0	0.877	1.00	927
UpStream								
DownStream	751	0.92	Level	20	0	0.909	1.00	898

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3989 pc/h

V_3 or V_{av34} 1980 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7950	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7023	Exhibit 13-8	9600	No
V_R	927	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3989	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.6 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.381 (Exhibit 13-12)

S_R= 59.3 mph (Exhibit 13-12)

S_0= 73.0 mph (Exhibit 13-12)

S = 65.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2019 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 748 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	6319
Ramp Volume, V_R	751
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6319	0.92	Level	5	0	0.976	1.00	7040
Ramp	751	0.92	Level	20	0	0.909	1.00	898
UpStream	748	0.92	Level	28	0	0.877	1.00	927
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.106 using Equation (Exhibit 13-6)
V_{12} = 743 pc/h
V_3 or V_{av34} = 3148 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2816 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7938	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3714	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.9 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.436 (Exibit 13-11)
S_R = 57.8 mph (Exhibit 13-11)
S_0 = 64.2 mph (Exhibit 13-11)
S = 61.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 3688	
	Ramp Volume, V_R: 1332	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3688	0.92	Level	4	0	0.980	1.00	4089
Ramp	1332	0.92	Level	4	0	0.980	1.00	1477
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.590 using Equation (Exhibit 13-7)

V_{12} = 3018 pc/h

V_3 or V_{av34} 1071 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4089	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2612	Exhibit 13-8	7200	No
V_R	1477	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3018	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.431 (Exhibit 13-12)

S_R = 57.9 mph (Exhibit 13-12)

S_0 = 76.5 mph (Exhibit 13-12)

S = 61.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3736	V_D =	345 veh/h
		Ramp Volume, V_R	1671		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3736	0.92	Level	3	0	0.985	1.00	4122
Ramp	1671	0.92	Level	5	0	0.976	1.00	1862
UpStream								
DownStream	345	0.92	Level	3	0	0.985	1.00	381

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.571 using Equation (Exhibit 13-7)

V_{12} = 3153 pc/h

V_3 or V_{av34} 969 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4122	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2260	Exhibit 13-8	7200	No
V_R	1862	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3153	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.466 (Exhibit 13-12)

S_R = 57.0 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 60.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	475	☑ No	☐ Off
L_{up} =	1460 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	1027 veh/h	Freeway Volume, V_F	2756	V_D =	veh/h
		Ramp Volume, V_R	863		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	25.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2756	0.92	Level	1	0	0.995	1.00	3011
Ramp	863	0.92	Level	12	0	0.943	1.00	994
UpStream	1027	0.92	Level	4	0	0.980	1.00	1139
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3011 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4005	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4005	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 33.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.511 (Exibit 13-11)

S_R = 55.7 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 55.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 69 veh/h
	Freeway Volume, V_F: 2756	
	Ramp Volume, V_R: 863	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2756	0.92	Level	1	0	0.995	1.00	3011
Ramp	863	0.92	Level	12	0	0.943	1.00	994
UpStream								
DownStream	69	0.92	Level	8	0	0.962	1.00	78

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3011 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4005	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4005	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 33.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.511 (Exibit 13-11)

S_R = 55.7 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 55.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3443	
	Ramp Volume, V_R: 1073	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3443	0.92	Level	5	0	0.976	1.00	3836
Ramp	1073	0.92	Level	5	0	0.976	1.00	1195
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2264 pc/h

V_3 or V_{av34} = 1572 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2264 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5031	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3459	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 29.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.404 (Exibit 13-11)

S_R = 58.7 mph (Exhibit 13-11)

S_0 = 66.1 mph (Exhibit 13-11)

S = 60.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	385 veh/h	Freeway Volume, V_F	4921	V_D =	veh/h
		Ramp Volume, V_R	663		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4921	0.92	Level	8	0	0.962	1.00	5563
Ramp	663	0.92	Level	15	0	0.930	1.00	775
UpStream	385	0.92	Level	2	0	0.990	1.00	423
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3291 pc/h

V_3 or V_{av34} = 2272 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3291 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6338	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4066	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 33.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.503 (Exibit 13-11)

S_R = 55.9 mph (Exhibit 13-11)

S_0 = 63.6 mph (Exhibit 13-11)

S = 58.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	4743	V_D =	488 veh/h
		Ramp Volume, V_R	1407		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4743	0.92	Level	12	0	0.943	1.00	5465
Ramp	1407	0.92	Level	9	0	0.957	1.00	1598
UpStream								
DownStream	488	0.92	Level	2	0	0.990	1.00	536

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.550 using Equation (Exhibit 13-7)

V_{12} = 3724 pc/h

V_3 or V_{av34} 1741 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5465	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3867	Exhibit 13-8	7200	No
V_R	1598	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3724	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.442 (Exhibit 13-12)

S_R = 57.6 mph (Exhibit 13-12)

S_0 = 73.9 mph (Exhibit 13-12)

S = 62.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 2200 ft	Acceleration Lane Length, L_A: 750	L_{down} = ft
V_u = 947 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6288	
	Ramp Volume, V_R: 899	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6288	0.92	Level	2	0	0.990	1.00	6903
Ramp	899	0.92	Level	19	0	0.913	1.00	1070
UpStream	947	0.92	Level	11	0	0.948	1.00	1086
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.084 using Equation (Exhibit 13-6)

V_{12} = 580 pc/h

V_3 or V_{av34} = 3161 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2761 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7973	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3831	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.433 (Exibit 13-11)

S_R = 57.9 mph (Exhibit 13-11)

S_0 = 64.3 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	7235	V_D =	899 veh/h
		Ramp Volume, V_R	947		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7235	0.92	Level	3	0	0.985	1.00	7982
Ramp	947	0.92	Level	11	0	0.948	1.00	1086
UpStream								
DownStream	899	0.92	Level	19	0	0.913	1.00	1070

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4093 pc/h

V_3 or V_{av34} 1944 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7982	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6896	Exhibit 13-8	9600	No
V_R	1086	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4093	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.9 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.396 (Exhibit 13-12)

S_R = 58.9 mph (Exhibit 13-12)

S_0 = 73.1 mph (Exhibit 13-12)

S = 65.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	220
Freeway Volume, V_F	6422
Ramp Volume, V_R	791
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2115 ft; V_D = 896 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6422	0.92	Level	4	0	0.980	1.00	7120
Ramp	791	0.92	Level	17	0	0.922	1.00	933
UpStream								
DownStream	896	0.92	Level	18	0	0.917	1.00	1062

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3631 pc/h

V_3 or V_{av34} 1744 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7120	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6187	Exhibit 13-8	9600	No
V_R	933	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3631	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.382 (Exhibit 13-12)

S_R = 59.3 mph (Exhibit 13-12)

S_0 = 73.9 mph (Exhibit 13-12)

S = 65.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	RV	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	6/13/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2019 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 2115 ft	Acceleration Lane Length, L_A: 500	L_{down} = ft
V_u = 791 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 5631	
	Ramp Volume, V_R: 896	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5631	0.92	Level	3	0	0.985	1.00	6212
Ramp	896	0.92	Level	18	0	0.917	1.00	1062
UpStream	791	0.92	Level	17	0	0.922	1.00	933
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.085 using Equation (Exhibit 13-6)

V_{12} = 528 pc/h

V_3 or V_{av34} = 2842 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2484 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7274	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3546	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.411 (Exibit 13-11)

S_R = 58.5 mph (Exhibit 13-11)

S_0 = 65.1 mph (Exhibit 13-11)

S = 61.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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APPENDIX 7.11:

OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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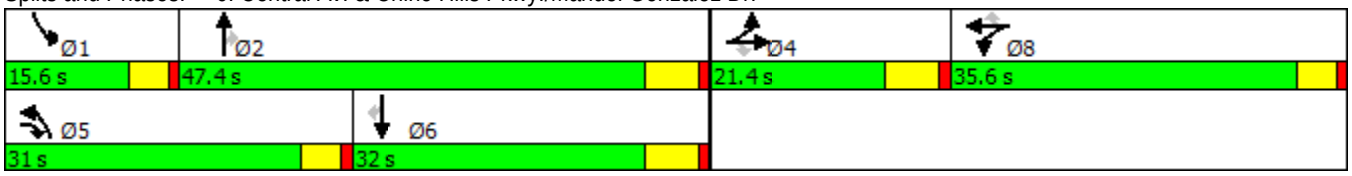
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	313	53	261	2	3	7	376	844	46	66	694	259
Future Volume (vph)	313	53	261	2	3	7	376	844	46	66	694	259
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	5	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	31.0	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	25.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	47.1	13.5	13.5	13.5	26.9	47.6	47.6	8.2	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.50	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.76	0.72	0.31	0.01	0.01	0.02	0.89	0.53	0.06	0.52	0.78	0.50
Control Delay	60.3	55.9	2.4	35.5	35.3	0.1	57.4	21.3	0.2	57.7	39.8	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	55.9	2.4	35.5	35.3	0.1	57.4	21.3	0.2	57.7	39.8	14.8
LOS	E	E	A	D	D	A	E	C	A	E	D	B
Approach Delay		34.9			13.7			31.3			34.6	
Approach LOS		C			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 33.1	Intersection LOS: C
Intersection Capacity Utilization 74.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	53	261	2	3	7	376	844	46	66	694	259
Future Volume (veh/h)	313	53	261	2	3	7	376	844	46	66	694	259
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	381	0	188	2	3	3	409	917	38	72	754	227
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	478	0	643	33	36	31	442	1810	793	90	1067	471
Arrive On Green	0.15	0.00	0.15	0.02	0.02	0.02	0.27	0.53	0.53	0.06	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	381	0	188	2	3	3	409	917	38	72	754	227
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	9.5	0.0	6.8	0.1	0.1	0.2	20.6	14.5	1.0	3.7	16.3	10.2
Cycle Q Clear(g_c), s	9.5	0.0	6.8	0.1	0.1	0.2	20.6	14.5	1.0	3.7	16.3	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	478	0	643	33	36	31	442	1810	793	90	1067	471
V/C Ratio(X)	0.80	0.00	0.29	0.06	0.08	0.10	0.93	0.51	0.05	0.80	0.71	0.48
Avail Cap(c_a), veh/h	601	0	701	597	664	565	509	1810	793	212	1067	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	16.1	40.4	40.4	40.4	29.7	12.7	9.6	39.2	25.5	23.4
Incr Delay (d2), s/veh	5.9	0.0	0.2	0.8	1.0	1.3	20.3	1.0	0.1	6.1	4.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	2.9	0.1	0.1	0.1	11.7	7.0	0.4	1.8	8.2	4.7
LnGrp Delay(d),s/veh	40.5	0.0	16.3	41.1	41.3	41.7	50.0	13.7	9.7	45.4	29.5	26.9
LnGrp LOS	D		B	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		569			8			1364			1053	
Approach Delay, s/veh		32.5			41.4			24.5			30.0	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	50.3		18.2	27.5	32.0		6.3
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.7	16.5		11.5	22.6	18.3		2.2
Green Ext Time (p_c), s	0.0	17.6		0.8	0.3	6.7		0.0

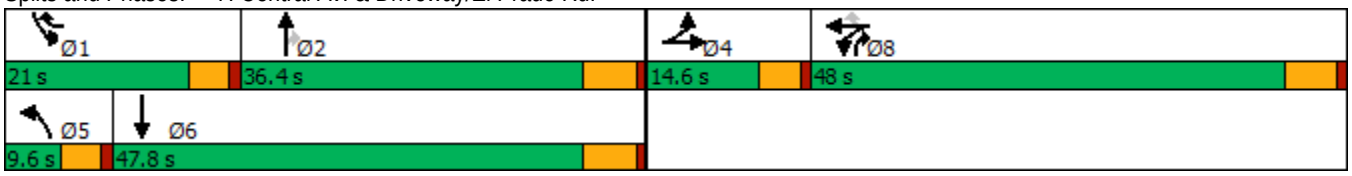
Intersection Summary	
HCM 2010 Ctrl Delay	28.0
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1048	3	510	2	783	698	400	639
Future Volume (vph)	1	1	1048	3	510	2	783	698	400	639
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	48.0	48.0	21.0	9.6	36.4	48.0	21.0	47.8
Total Split (%)	12.2%	12.2%	40.0%	40.0%	17.5%	8.0%	30.3%	40.0%	17.5%	39.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	42.3	42.3	64.6	5.0	30.7	73.0	16.4	50.0
Actuated g/C Ratio	0.09	0.09	0.39	0.39	0.60	0.05	0.28	0.67	0.15	0.46
v/c Ratio	0.01	0.01	0.97	0.92	0.56	0.03	0.90	0.65	0.93	0.32
Control Delay	48.0	41.0	64.2	53.5	9.2	53.0	51.1	5.0	74.1	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	64.2	53.5	9.2	53.0	51.1	5.0	74.1	20.1
LOS	D	D	E	D	A	D	D	A	E	C
Approach Delay		43.3		42.6			29.4			40.7
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 37.3	Intersection LOS: D
Intersection Capacity Utilization 88.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1048	3	510	2	783	698	400	639	10
Future Volume (veh/h)	1	1	1	1048	3	510	2	783	698	400	639	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1166	0	424	2	870	607	444	710	9
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1223	0	805	4	948	997	467	2116	27
Arrive On Green	0.01	0.01	0.01	0.38	0.00	0.38	0.00	0.28	0.28	0.15	0.42	0.42
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	3141	5001	63
Grp Volume(v), veh/h	1	0	2	1166	0	424	2	870	607	444	465	254
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1570	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	38.6	0.0	20.0	0.1	27.2	25.6	15.5	10.5	10.5
Cycle Q Clear(g_c), s	0.1	0.0	0.1	38.6	0.0	20.0	0.1	27.2	25.6	15.5	10.5	10.5
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	13	0	13	1223	0	805	4	948	997	467	1386	757
V/C Ratio(X)	0.08	0.00	0.15	0.95	0.00	0.53	0.46	0.92	0.61	0.95	0.34	0.34
Avail Cap(c_a), veh/h	147	0	150	1238	0	812	73	948	997	467	1386	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	0.0	54.4	33.4	0.0	17.1	55.0	38.7	11.0	46.6	21.4	21.4
Incr Delay (d2), s/veh	0.9	0.0	2.0	15.6	0.0	0.6	25.4	15.0	2.8	29.3	0.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	19.8	0.0	8.5	0.1	14.8	19.1	8.6	4.9	5.5
LnGrp Delay(d),s/veh	55.3	0.0	56.3	49.0	0.0	17.7	80.3	53.7	13.8	75.9	22.1	22.6
LnGrp LOS	E		E	D		B	F	D	B	E	C	C
Approach Vol, veh/h		3			1590			1479			1163	
Approach Delay, s/veh		56.0			40.7			37.3			42.7	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.0	36.4		5.5	4.9	52.5		47.5
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	16.4	30.6		10.0	5.0	42.0		42.2
Max Q Clear Time (g_c+I1), s	17.5	29.2		2.1	2.1	12.5		40.6
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	6.5		1.0

Intersection Summary			
HCM 2010 Ctrl Delay		40.1	
HCM 2010 LOS		D	

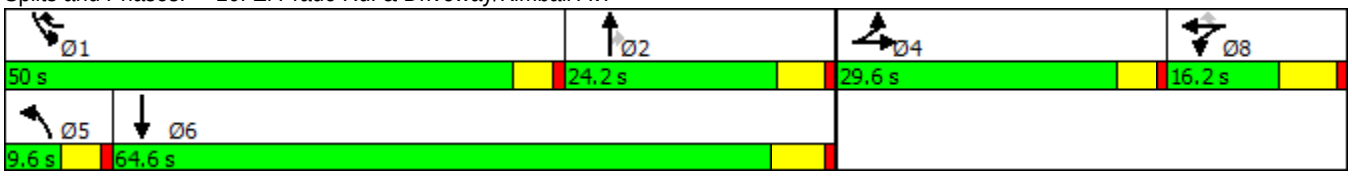
Notes

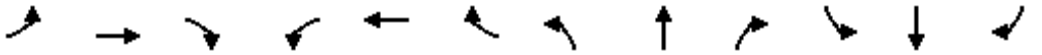
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	1	27	1275	5	288	32	743	209
Future Volume (vph)	12	1	27	1275	5	288	32	743	209
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	50.0	9.6	24.2	24.2	50.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	41.7%	8.0%	20.2%	20.2%	41.7%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	59.0	5.1	19.5	19.5	46.6	60.4
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.63
v/c Ratio	0.06	0.01	0.31	1.10	0.06	0.81	0.08	0.50	0.23
Control Delay	40.2	30.3	50.1	71.7	52.6	57.6	0.3	21.3	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.3	50.1	71.7	52.6	57.6	0.3	21.3	11.3
LOS	D	C	D	E	D	E	A	C	B
Approach Delay		38.2	70.7			51.8			18.8
Approach LOS		D	E			D			B

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 96
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 48.9 — Intersection LOS: D
Intersection Capacity Utilization 119.7% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	2	29	27	1275	5	288	32	743	209	44
Future Volume (veh/h)	12	1	2	29	27	1275	5	288	32	743	209	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	1	1	30	28	440	5	294	33	758	213	45
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	56	28	28	138	129	662	123	381	323	882	600	127
Arrive On Green	0.03	0.03	0.03	0.15	0.15	0.15	0.08	0.21	0.21	0.28	0.42	0.42
Sat Flow, veh/h	1619	827	827	908	847	1530	1619	1800	1530	3141	1441	305
Grp Volume(v), veh/h	12	0	2	58	0	440	5	294	33	758	0	258
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1570	0	1746
Q Serve(g_s), s	0.5	0.0	0.1	1.9	0.0	10.0	0.2	10.1	1.1	15.1	0.0	6.7
Cycle Q Clear(g_c), s	0.5	0.0	0.1	1.9	0.0	10.0	0.2	10.1	1.1	15.1	0.0	6.7
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	56	0	57	266	0	662	123	381	323	882	0	727
V/C Ratio(X)	0.22	0.00	0.04	0.22	0.00	0.66	0.04	0.77	0.10	0.86	0.00	0.35
Avail Cap(c_a), veh/h	614	0	628	266	0	662	123	519	441	2164	0	1558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.0	0.0	30.8	24.5	0.0	14.9	28.2	24.5	20.9	22.5	0.0	13.2
Incr Delay (d2), s/veh	1.9	0.0	0.3	0.4	0.0	2.5	0.0	4.9	0.1	1.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	0.9	0.0	6.7	0.1	5.5	0.5	6.6	0.0	3.3
LnGrp Delay(d),s/veh	32.9	0.0	31.0	24.9	0.0	17.4	28.3	29.4	21.1	23.4	0.0	13.5
LnGrp LOS	C		C	C		B	C	C	C	C		B
Approach Vol, veh/h		14			498			332			1016	
Approach Delay, s/veh		32.6			18.3			28.6			20.9	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.1	19.7		6.9	9.6	33.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	45.4	* 19		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	17.1	12.1		2.5	2.2	8.7		12.0
Green Ext Time (p_c), s	1.4	1.8		0.0	0.0	3.4		0.0

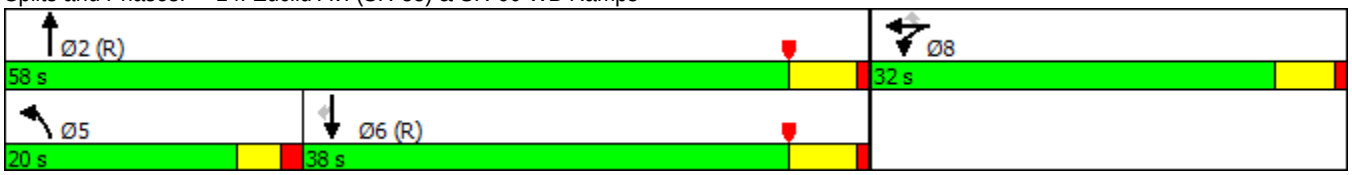
Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	744	2	386	459	982	1054	489
Future Volume (vph)	744	2	386	459	982	1054	489
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	32.0	32.0	32.0	20.0	58.0	38.0	38.0
Total Split (%)	35.6%	35.6%	35.6%	22.2%	64.4%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	26.4	26.4	26.4	15.4	53.1	33.2	33.2
Actuated g/C Ratio	0.29	0.29	0.29	0.17	0.59	0.37	0.37
v/c Ratio	0.94	0.92	0.76	0.92	0.52	0.90	0.60
Control Delay	63.1	58.1	32.5	51.1	17.6	38.2	5.2
Queue Delay	1.4	1.0	0.0	0.0	1.1	0.0	0.0
Total Delay	64.5	59.1	32.5	51.1	18.7	38.2	5.2
LOS	E	E	C	D	B	D	A
Approach Delay		52.9			29.0	27.7	
Approach LOS		D			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 50 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 133.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	744	2	386	459	982	0	0	1054	489
Future Volume (veh/h)	0	0	0	744	2	386	459	982	0	0	1054	489
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				882	0	174	494	1056	0	0	1133	526
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				945	0	446	541	2023	0	0	1263	553
Arrive On Green				0.29	0.00	0.29	0.06	0.20	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1530	3141	3510	0	0	3510	1496
Grp Volume(v), veh/h				882	0	174	494	1056	0	0	1133	526
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1570	1710	0	0	1710	1496
Q Serve(g_s), s				23.9	0.0	8.2	14.1	24.9	0.0	0.0	28.1	30.8
Cycle Q Clear(g_c), s				23.9	0.0	8.2	14.1	24.9	0.0	0.0	28.1	30.8
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				945	0	446	541	2023	0	0	1263	553
V/C Ratio(X)				0.93	0.00	0.39	0.91	0.52	0.00	0.00	0.90	0.95
Avail Cap(c_a), veh/h				971	0	459	541	2023	0	0	1263	553
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.55	0.55	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.0	0.0	25.5	41.8	24.8	0.0	0.0	26.8	27.6
Incr Delay (d2), s/veh				14.9	0.0	0.2	12.2	0.5	0.0	0.0	10.2	28.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.6	0.0	3.5	7.0	12.0	0.0	0.0	15.0	17.0
LnGrp Delay(d),s/veh				45.9	0.0	25.7	54.0	25.3	0.0	0.0	36.9	55.6
LnGrp LOS				D		C	D	C			D	E
Approach Vol, veh/h					1056			1550			1659	
Approach Delay, s/veh					42.6			34.5			42.8	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.7			20.0	38.7		31.3
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		52.5			15.5	32.5		27.0
Max Q Clear Time (g_c+I1), s		26.9			16.1	32.8		25.9
Green Ext Time (p_c), s		22.7			0.0	0.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	39.7
HCM 2010 LOS	D

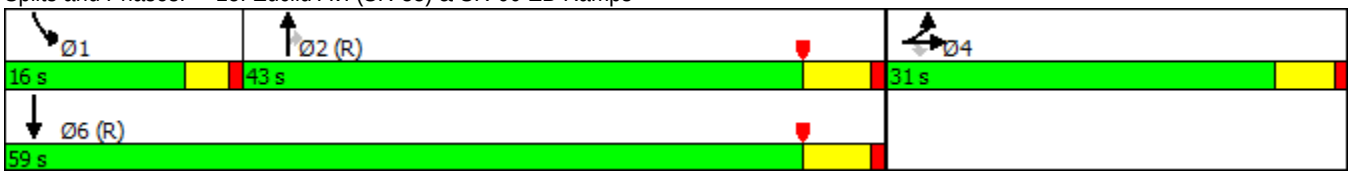
Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	344	0	615	1097	649	305	1493
Future Volume (vph)	344	0	615	1097	649	305	1493
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	31.0	31.0	31.0	43.0	43.0	16.0	59.0
Total Split (%)	34.4%	34.4%	34.4%	47.8%	47.8%	17.8%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.9	22.9	22.9	40.9	40.9	11.7	56.6
Actuated g/C Ratio	0.25	0.25	0.25	0.45	0.45	0.13	0.63
v/c Ratio	0.85	0.82	0.81	0.75	0.65	0.80	0.74
Control Delay	51.6	41.1	39.4	25.2	4.8	45.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	51.6	41.1	39.4	25.2	4.8	45.0	5.9
LOS	D	D	D	C	A	D	A
Approach Delay		43.9		17.6			12.5
Approach LOS		D		B			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 21.2 — Intersection LOS: C
Intersection Capacity Utilization 133.0% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	0	615	0	0	0	0	1097	649	305	1493	0
Future Volume (veh/h)	344	0	615	0	0	0	0	1097	649	305	1493	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	244	0	702				0	1167	690	324	1588	0
Adj No. of Lanes	1	0	2				0	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	413	0	781				0	1571	701	391	2148	0
Arrive On Green	0.26	0.00	0.26				0.00	0.46	0.46	0.08	0.42	0.00
Sat Flow, veh/h	1619	0	3060				0	3510	1526	3141	3510	0
Grp Volume(v), veh/h	244	0	702				0	1167	690	324	1588	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1526	1570	1710	0
Q Serve(g_s), s	11.9	0.0	20.0				0.0	25.2	40.2	9.1	35.1	0.0
Cycle Q Clear(g_c), s	11.9	0.0	20.0				0.0	25.2	40.2	9.1	35.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	413	0	781				0	1571	701	391	2148	0
V/C Ratio(X)	0.59	0.00	0.90				0.00	0.74	0.98	0.83	0.74	0.00
Avail Cap(c_a), veh/h	468	0	884				0	1571	701	419	2148	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.71	0.71	0.29	0.29	0.00
Uniform Delay (d), s/veh	29.4	0.0	32.4				0.0	20.0	24.0	40.3	19.9	0.0
Incr Delay (d2), s/veh	0.8	0.0	10.4				0.0	2.3	25.2	3.6	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	9.5				0.0	12.3	21.8	4.2	16.8	0.0
LnGrp Delay(d),s/veh	30.1	0.0	42.8				0.0	22.3	49.2	43.9	20.6	0.0
LnGrp LOS	C		D					C	D	D	C	
Approach Vol, veh/h		946						1857			1912	
Approach Delay, s/veh		39.5						32.3			24.5	
Approach LOS		D						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.2	46.8		28.0		62.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	12.0	37.5		26.0		53.5		
Max Q Clear Time (g_c+I1), s	11.1	42.2		22.0		37.1		
Green Ext Time (p_c), s	0.1	0.0		1.0		16.0		

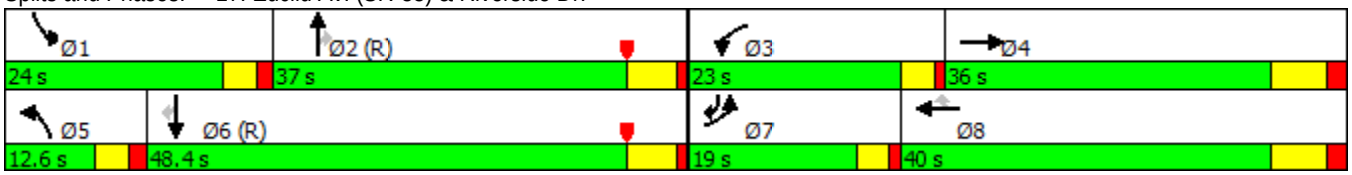
Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

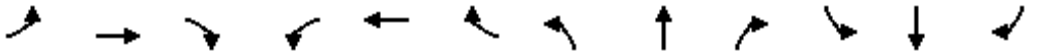
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	148	337	179	396	52	65	983	175	186	1064	153
Future Volume (vph)	148	337	179	396	52	65	983	175	186	1064	153
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	19.0	36.0	23.0	40.0	40.0	12.6	37.0	37.0	24.0	48.4	19.0
Total Split (%)	15.8%	30.0%	19.2%	33.3%	33.3%	10.5%	30.8%	30.8%	20.0%	40.3%	15.8%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.9	21.3	16.9	24.3	24.3	9.3	42.1	42.1	18.7	53.7	73.1
Actuated g/C Ratio	0.12	0.18	0.14	0.20	0.20	0.08	0.35	0.35	0.16	0.45	0.61
v/c Ratio	0.83	0.68	0.83	0.60	0.13	0.54	0.60	0.28	0.78	0.51	0.16
Control Delay	85.9	49.9	78.6	46.5	0.7	60.4	30.9	11.3	48.3	17.5	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.9	49.9	78.6	46.5	0.7	60.4	30.9	11.3	48.3	17.5	6.8
LOS	F	D	E	D	A	E	C	B	D	B	A
Approach Delay		59.8		51.8			29.7			20.4	
Approach LOS		E		D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 68 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 34.2	Intersection LOS: C
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	337	54	179	396	52	65	983	175	186	1064	153
Future Volume (veh/h)	148	337	54	179	396	52	65	983	175	186	1064	153
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	156	355	34	188	417	50	68	1035	103	196	1120	95
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	180	539	51	212	653	292	85	1891	589	223	2312	890
Arrive On Green	0.11	0.17	0.17	0.13	0.19	0.19	0.02	0.13	0.13	0.05	0.16	0.16
Sat Flow, veh/h	1619	3152	300	1619	3420	1528	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	156	192	197	188	417	50	68	1035	103	196	1120	95
Grp Sat Flow(s),veh/h/ln	1619	1710	1742	1619	1710	1528	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	11.4	12.6	12.7	13.7	13.5	3.3	5.0	23.7	7.2	14.4	25.0	5.1
Cycle Q Clear(g_c), s	11.4	12.6	12.7	13.7	13.5	3.3	5.0	23.7	7.2	14.4	25.0	5.1
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	292	298	212	653	292	85	1891	589	223	2312	890
V/C Ratio(X)	0.87	0.66	0.66	0.89	0.64	0.17	0.80	0.55	0.17	0.88	0.48	0.11
Avail Cap(c_a), veh/h	202	413	421	256	941	420	109	1891	589	263	2312	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.68	0.68	0.68	0.58	0.58	0.58
Uniform Delay (d), s/veh	52.5	46.5	46.5	51.2	44.7	40.6	58.3	42.6	35.4	56.3	37.4	18.5
Incr Delay (d2), s/veh	26.3	3.5	3.6	23.0	1.5	0.4	19.2	0.8	0.4	15.5	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	6.2	6.4	7.5	6.5	1.4	2.7	10.9	3.1	7.4	11.4	2.2
LnGrp Delay(d),s/veh	78.7	50.0	50.1	74.3	46.2	41.0	77.6	43.3	35.8	71.8	37.8	18.6
LnGrp LOS	E	D	D	E	D	D	E	D	D	E	D	B
Approach Vol, veh/h		545			655			1206			1411	
Approach Delay, s/veh		58.3			53.9			44.6			41.2	
Approach LOS		E			D			D			D	

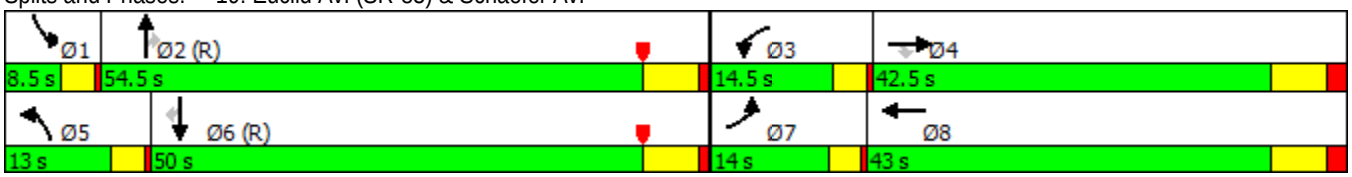
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.1	51.7	19.7	27.5	10.8	61.9	17.3	29.9
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	19.5	31.5	19.0	29.0	8.1	42.9	15.0	33.0
Max Q Clear Time (g_c+I1), s	16.4	25.7	15.7	14.7	7.0	27.0	13.4	15.5
Green Ext Time (p_c), s	0.1	5.0	0.1	5.6	0.0	11.9	0.0	6.2

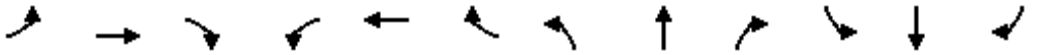
Intersection Summary	
HCM 2010 Ctrl Delay	46.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	142	62	116	57	121	120	1431	21	15	1608	134
Future Volume (vph)	142	62	116	57	121	120	1431	21	15	1608	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	42.5	42.5	14.5	43.0	13.0	54.5	54.5	8.5	50.0	50.0
Total Split (%)	11.7%	35.4%	35.4%	12.1%	35.8%	10.8%	45.4%	45.4%	7.1%	41.7%	41.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.0	22.1	22.1	10.3	17.7	14.7	70.1	70.1	5.4	55.6	55.6
Actuated g/C Ratio	0.10	0.18	0.18	0.09	0.15	0.12	0.58	0.58	0.04	0.46	0.46
v/c Ratio	0.94	0.20	0.32	0.44	0.56	0.65	0.53	0.02	0.22	0.75	0.19
Control Delay	110.6	42.6	8.6	62.6	51.5	41.7	21.4	2.4	84.1	11.5	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.6	42.6	8.6	62.6	51.5	41.7	21.4	2.4	84.1	11.5	0.7
LOS	F	D	A	E	D	D	C	A	F	B	A
Approach Delay		60.5			54.7		22.7			11.3	
Approach LOS		E			D		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 74.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	62	116	57	121	18	120	1431	21	15	1608	134
Future Volume (veh/h)	142	62	116	57	121	18	120	1431	21	15	1608	134
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	151	66	71	61	129	17	128	1522	17	16	1711	95
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	142	217	184	117	164	22	128	3062	953	28	2758	839
Arrive On Green	0.09	0.12	0.12	0.07	0.11	0.11	0.03	0.21	0.21	0.01	0.38	0.38
Sat Flow, veh/h	1619	1800	1530	1619	1558	205	1619	4914	1530	1619	4914	1494
Grp Volume(v), veh/h	151	66	71	61	0	146	128	1522	17	16	1711	95
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1638	1530	1619	1638	1494
Q Serve(g_s), s	10.5	4.0	5.1	4.4	0.0	9.7	9.5	32.9	1.1	1.2	34.0	5.0
Cycle Q Clear(g_c), s	10.5	4.0	5.1	4.4	0.0	9.7	9.5	32.9	1.1	1.2	34.0	5.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	142	217	184	117	0	186	128	3062	953	28	2758	839
V/C Ratio(X)	1.07	0.30	0.38	0.52	0.00	0.78	1.00	0.50	0.02	0.57	0.62	0.11
Avail Cap(c_a), veh/h	142	533	453	148	0	529	128	3062	953	67	2758	839
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.66	0.66	0.66	0.39	0.39	0.39
Uniform Delay (d), s/veh	54.8	48.2	48.7	53.6	0.0	52.3	58.4	31.0	18.4	58.9	27.0	18.0
Incr Delay (d2), s/veh	94.3	0.6	1.0	1.3	0.0	5.4	64.3	0.4	0.0	2.7	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	2.0	2.2	2.0	0.0	5.0	6.5	15.1	0.5	0.6	15.5	2.1
LnGrp Delay(d),s/veh	149.1	48.7	49.6	55.0	0.0	57.7	122.7	31.4	18.4	61.6	27.5	18.1
LnGrp LOS	F	D	D	D		E	F	C	B	E	C	B
Approach Vol, veh/h		288			207			1667			1822	
Approach Delay, s/veh		101.6			56.9			38.3			27.3	
Approach LOS		F			E			D			C	

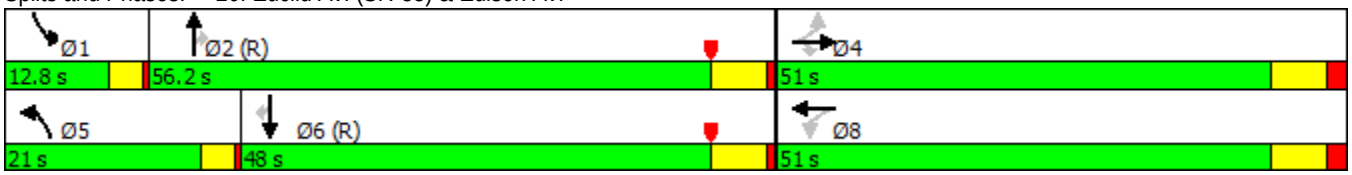
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	80.8	12.2	21.5	13.0	73.3	14.0	19.7
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	48.5	11.0	35.5	9.5	44.0	10.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	34.9	6.4	7.1	11.5	36.0	12.5	11.7
Green Ext Time (p_c), s	0.0	12.5	0.0	1.0	0.0	7.6	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	218	169	224	68	349	249	1278	37	41	1446	252
Future Volume (vph)	218	169	224	68	349	249	1278	37	41	1446	252
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	21.0	56.2	56.2	12.8	48.0	48.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	17.5%	46.8%	46.8%	10.7%	40.0%	40.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.3	44.3	44.3	44.3	44.3	17.5	53.5	53.5	7.5	41.7	41.7
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.15	0.45	0.45	0.06	0.35	0.35
v/c Ratio	1.10	0.27	0.33	0.18	0.63	1.13	0.62	0.05	0.44	0.90	0.41
Control Delay	127.9	28.1	4.6	27.5	36.1	134.1	17.6	1.4	79.7	30.6	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.9	28.1	4.6	27.5	36.1	134.1	17.6	1.4	79.7	30.6	9.8
LOS	F	C	A	C	D	F	B	A	E	C	A
Approach Delay		55.1			34.8		35.8			28.8	
Approach LOS		E			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 100.8%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	169	224	68	349	40	249	1278	37	41	1446	252
Future Volume (veh/h)	218	169	224	68	349	40	249	1278	37	41	1446	252
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	232	180	171	72	371	41	265	1360	24	44	1538	237
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	660	561	353	584	65	236	2271	707	54	1720	535
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.29	0.92	0.92	0.03	0.35	0.35
Sat Flow, veh/h	934	1800	1530	988	1593	176	1619	4914	1530	1619	4914	1528
Grp Volume(v), veh/h	232	180	171	72	0	412	265	1360	24	44	1538	237
Grp Sat Flow(s),veh/h/ln	934	1800	1530	988	0	1769	1619	1638	1530	1619	1638	1528
Q Serve(g_s), s	20.9	8.4	9.6	6.6	0.0	23.1	17.5	5.6	0.1	3.2	35.5	14.3
Cycle Q Clear(g_c), s	44.0	8.4	9.6	15.1	0.0	23.1	17.5	5.6	0.1	3.2	35.5	14.3
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	660	561	353	0	649	236	2271	707	54	1720	535
V/C Ratio(X)	1.04	0.27	0.30	0.20	0.00	0.64	1.12	0.60	0.03	0.81	0.89	0.44
Avail Cap(c_a), veh/h	223	660	561	353	0	649	236	2271	707	125	1720	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.75	0.75	0.75	0.63	0.63	0.63
Uniform Delay (d), s/veh	52.4	26.7	27.1	32.0	0.0	31.4	42.5	2.7	2.4	57.6	36.9	30.0
Incr Delay (d2), s/veh	71.4	0.2	0.3	0.3	0.0	2.0	88.0	0.9	0.1	6.5	5.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.8	4.2	4.1	1.8	0.0	11.6	13.5	2.2	0.1	1.6	16.9	6.3
LnGrp Delay(d),s/veh	123.8	27.0	27.4	32.3	0.0	33.4	130.5	3.5	2.5	64.1	41.9	31.7
LnGrp LOS	F	C	C	C		C	F	A	A	E	D	C
Approach Vol, veh/h		583			484			1649			1819	
Approach Delay, s/veh		65.6			33.3			23.9			41.1	
Approach LOS		E			C			C			D	

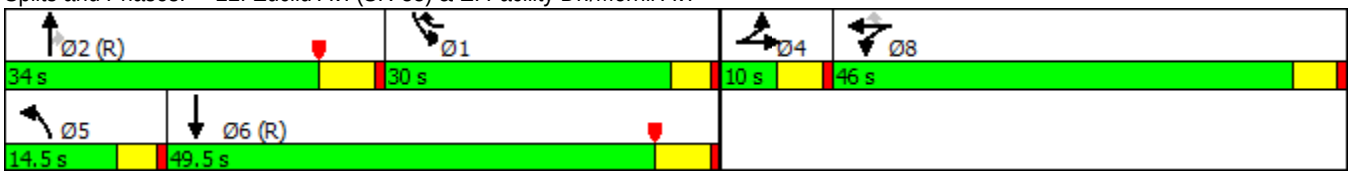
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	61.5		51.0	21.0	48.0		51.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.3	50.2		44.0	17.5	42.0		44.0
Max Q Clear Time (g_c+I1), s	5.2	7.6		46.0	19.5	37.5		25.1
Green Ext Time (p_c), s	0.0	31.7		0.0	0.0	4.2		5.4

Intersection Summary		
HCM 2010 Ctrl Delay		37.2
HCM 2010 LOS		D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	6	48	614	20	1046	183	480	1418
Future Volume (vph)	6	48	614	20	1046	183	480	1418
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	30.0	14.5	34.0	34.0	30.0	49.5
Total Split (%)	8.3%	38.3%	25.0%	12.1%	28.3%	28.3%	25.0%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	35.2	61.0	10.0	40.0	40.0	25.3	64.0
Actuated g/C Ratio	0.04	0.29	0.51	0.08	0.33	0.33	0.21	0.53
v/c Ratio	0.24	0.90	0.76	0.16	0.67	0.32	0.73	0.58
Control Delay	54.8	61.5	19.5	61.9	24.8	7.8	65.6	36.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	61.5	19.5	61.9	24.8	7.8	65.6	36.2
LOS	D	E	B	E	C	A	E	D
Approach Delay	54.8	36.9			22.9			43.4
Approach LOS	D	D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 106 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 35.9	Intersection LOS: D
Intersection Capacity Utilization 83.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	387	48	614	20	1046	183	480	1418	44
Future Volume (veh/h)	8	6	4	387	48	614	20	1046	183	480	1418	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1768	1800	1800
Adj Flow Rate, veh/h	8	6	3	403	50	594	21	1090	165	500	1477	43
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	14	11	5	442	55	859	68	1147	357	905	2360	69
Arrive On Green	0.02	0.02	0.02	0.29	0.29	0.29	0.04	0.23	0.23	0.28	0.48	0.48
Sat Flow, veh/h	803	602	301	1533	190	1509	1619	4914	1530	3267	4908	143
Grp Volume(v), veh/h	17	0	0	453	0	594	21	1090	165	500	986	534
Grp Sat Flow(s),veh/h/ln	1707	0	0	1723	0	1509	1619	1638	1530	1633	1638	1775
Q Serve(g_s), s	1.2	0.0	0.0	30.5	0.0	0.0	1.5	26.2	11.1	15.7	26.8	26.8
Cycle Q Clear(g_c), s	1.2	0.0	0.0	30.5	0.0	0.0	1.5	26.2	11.1	15.7	26.8	26.8
Prop In Lane	0.47		0.18	0.89		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	31	0	0	497	0	859	68	1147	357	905	1575	853
V/C Ratio(X)	0.55	0.00	0.00	0.91	0.00	0.69	0.31	0.95	0.46	0.55	0.63	0.63
Avail Cap(c_a), veh/h	71	0	0	589	0	939	135	1147	357	905	1575	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	41.2	0.0	18.5	55.8	45.3	39.5	37.0	23.1	23.1
Incr Delay (d2), s/veh	5.6	0.0	0.0	15.5	0.0	1.5	0.8	15.4	3.7	0.4	1.9	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	16.6	0.0	14.2	0.7	13.4	5.1	7.1	12.5	13.9
LnGrp Delay(d),s/veh	64.1	0.0	0.0	56.7	0.0	20.0	56.6	60.7	43.2	37.5	25.0	26.6
LnGrp LOS	E			E		C	E	E	D	D	C	C
Approach Vol, veh/h		17			1047			1276			2020	
Approach Delay, s/veh		64.1			35.9			58.4			28.5	
Approach LOS		E			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	39.2	34.0		7.2	9.5	63.7		39.6
Change Period (Y+Rc), s	6.0	* 6		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	25.5	* 28		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	17.7	28.2		3.2	3.5	28.8		32.5
Green Ext Time (p_c), s	2.3	0.0		0.0	0.0	8.5		2.0

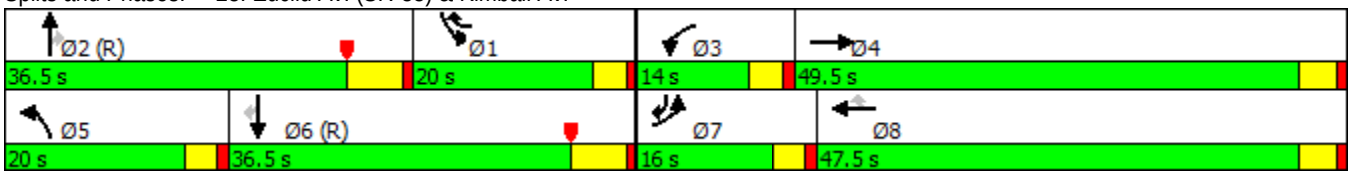
Intersection Summary	
HCM 2010 Ctrl Delay	39.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	278	323	129	587	130	174	783	188	334	726	624
Future Volume (vph)	278	323	129	587	130	174	783	188	334	726	624
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	1	5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	9.0	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	16.0	49.5	14.0	47.5	20.0	20.0	36.5	36.5	20.0	36.5	16.0
Total Split (%)	13.3%	41.3%	11.7%	39.6%	16.7%	16.7%	30.4%	30.4%	16.7%	30.4%	13.3%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	18.9	33.5	13.5	28.1	45.3	16.8	37.8	37.8	16.7	37.7	58.6
Actuated g/C Ratio	0.16	0.28	0.11	0.23	0.38	0.14	0.32	0.32	0.14	0.31	0.49
v/c Ratio	0.58	0.40	0.73	0.75	0.21	0.79	0.52	0.31	0.78	0.48	0.79
Control Delay	53.7	34.6	75.1	48.1	4.2	55.4	30.9	12.3	61.1	33.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	34.6	75.1	48.1	4.2	55.4	30.9	12.3	61.1	33.7	32.6
LOS	D	C	E	D	A	E	C	B	E	C	C
Approach Delay		42.8		45.5			31.6			38.8	
Approach LOS		D		D			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 49 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 38.8	Intersection LOS: D
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	323	46	129	587	130	174	783	188	334	726	624
Future Volume (veh/h)	278	323	46	129	587	130	174	783	188	334	726	624
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	284	330	45	132	599	111	178	799	184	341	741	599
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	314	716	97	135	752	799	204	1018	317	949	1967	758
Arrive On Green	0.10	0.24	0.24	0.08	0.22	0.22	0.04	0.07	0.07	0.30	0.40	0.40
Sat Flow, veh/h	3141	3028	409	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	284	185	190	132	599	111	178	799	184	341	741	599
Grp Sat Flow(s),veh/h/ln	1570	1710	1728	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	10.7	11.1	11.3	9.8	19.9	1.3	13.1	19.2	11.1	10.2	12.8	39.4
Cycle Q Clear(g_c), s	10.7	11.1	11.3	9.8	19.9	1.3	13.1	19.2	11.1	10.2	12.8	39.4
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	314	404	408	135	752	799	204	1018	317	949	1967	758
V/C Ratio(X)	0.90	0.46	0.46	0.98	0.80	0.14	0.87	0.78	0.58	0.36	0.38	0.79
Avail Cap(c_a), veh/h	314	641	648	135	1226	1011	216	1249	389	949	1967	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.73	0.73	0.73	0.69	0.69	0.69
Uniform Delay (d), s/veh	53.4	39.2	39.3	54.9	44.3	5.4	56.6	53.3	31.7	32.8	25.4	24.8
Incr Delay (d2), s/veh	25.7	0.7	0.8	70.4	0.7	0.0	21.9	4.5	5.6	0.1	0.4	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	5.3	5.5	7.0	9.5	1.0	7.1	9.2	5.2	4.4	5.8	17.5
LnGrp Delay(d),s/veh	79.1	40.0	40.1	125.3	45.0	5.5	78.4	57.8	37.3	32.8	25.8	30.7
LnGrp LOS	E	D	D	F	D	A	E	E	D	C	C	C
Approach Vol, veh/h		659			842			1161			1681	
Approach Delay, s/veh		56.9			52.4			57.7			29.0	
Approach LOS		E			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.3	30.9	14.0	32.9	19.1	54.0	16.0	30.9
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.0	* 31	10.0	45.0	16.0	30.5	12.0	43.0
Max Q Clear Time (g_c+I1), s	12.2	21.2	11.8	13.3	15.1	41.4	12.7	21.9
Green Ext Time (p_c), s	2.5	3.6	0.0	4.8	0.0	0.0	0.0	4.5

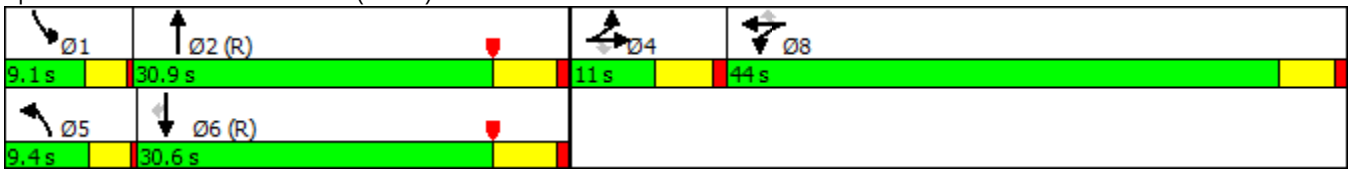
Intersection Summary	
HCM 2010 Ctrl Delay	45.4
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	86	28	52	278	411	257	79	774	71	685	112
Future Volume (vph)	86	28	52	278	411	257	79	774	71	685	112
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	11.0	11.0	11.0	44.0	44.0	44.0	9.4	30.9	9.1	30.6	30.6
Total Split (%)	11.6%	11.6%	11.6%	46.3%	46.3%	46.3%	9.9%	32.5%	9.6%	32.2%	32.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	6.3	6.3	6.3	31.5	31.5	31.5	8.1	30.6	7.6	30.0	30.0
Actuated g/C Ratio	0.07	0.07	0.07	0.33	0.33	0.33	0.09	0.32	0.08	0.32	0.32
v/c Ratio	0.84	0.25	0.25	0.52	0.83	0.42	0.61	0.79	0.59	0.67	0.21
Control Delay	99.3	47.9	2.8	28.5	41.6	8.0	62.8	37.3	62.7	33.5	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	47.9	2.8	28.5	41.6	8.0	62.8	37.3	62.7	33.5	6.2
LOS	F	D	A	C	D	A	E	D	E	C	A
Approach Delay		60.4			29.0			39.6		32.3	
Approach LOS		E			C			D		C	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	28	52	278	411	257	79	774	40	71	685	112
Future Volume (veh/h)	86	28	52	278	411	257	79	774	40	71	685	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	91	30	53	296	437	260	84	823	42	76	729	110
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	102	114	96	448	498	423	101	1331	68	94	1362	609
Arrive On Green	0.06	0.06	0.06	0.28	0.28	0.28	0.06	0.40	0.40	0.06	0.40	0.40
Sat Flow, veh/h	1619	1800	1523	1619	1800	1530	1619	3311	169	1619	3420	1530
Grp Volume(v), veh/h	91	30	53	296	437	260	84	425	440	76	729	110
Grp Sat Flow(s),veh/h/ln	1619	1800	1523	1619	1800	1530	1619	1710	1770	1619	1710	1530
Q Serve(g_s), s	5.3	1.5	3.2	15.4	22.0	14.1	4.9	18.8	18.8	4.4	15.5	4.4
Cycle Q Clear(g_c), s	5.3	1.5	3.2	15.4	22.0	14.1	4.9	18.8	18.8	4.4	15.5	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	102	114	96	448	498	423	101	687	711	94	1362	609
V/C Ratio(X)	0.89	0.26	0.55	0.66	0.88	0.61	0.84	0.62	0.62	0.80	0.54	0.18
Avail Cap(c_a), veh/h	102	114	96	665	739	628	101	687	711	95	1362	609
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.27	0.27	0.27	0.84	0.84	0.84
Uniform Delay (d), s/veh	44.2	42.4	43.2	30.4	32.8	29.9	44.1	22.6	22.6	44.2	21.9	18.5
Incr Delay (d2), s/veh	54.2	0.5	3.9	0.6	5.8	0.5	14.2	1.1	1.1	30.7	1.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.8	1.5	6.9	11.7	6.0	2.6	9.1	9.4	2.8	7.5	2.0
LnGrp Delay(d),s/veh	98.4	42.9	47.1	31.0	38.7	30.5	58.2	23.7	23.7	74.9	23.1	19.1
LnGrp LOS	F	D	D	C	D	C	E	C	C	E	C	B
Approach Vol, veh/h		174			993			949			915	
Approach Delay, s/veh		73.2			34.3			26.8			26.9	
Approach LOS		E			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.0	43.7		11.0	9.4	43.3		31.3
Change Period (Y+Rc), s	3.5	5.5		5.0	3.5	5.5		5.0
Max Green Setting (Gmax), s	5.6	25.4		6.0	5.9	25.1		39.0
Max Q Clear Time (g_c+I1), s	6.4	20.8		7.3	6.9	17.5		24.0
Green Ext Time (p_c), s	0.0	2.6		0.0	0.0	3.8		2.2

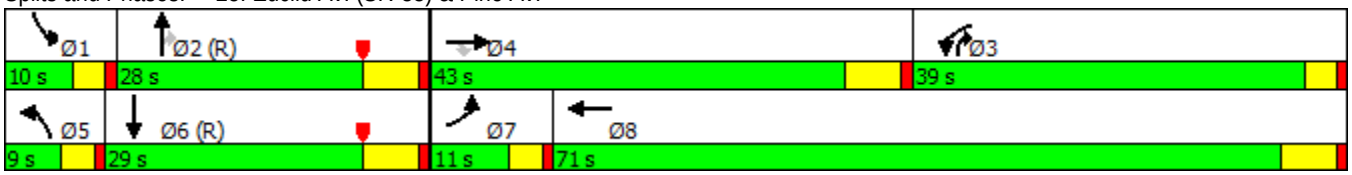
Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	223	33	897	169	59	876	506	83	910
Future Volume (vph)	5	223	33	897	169	59	876	506	83	910
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	11.0	43.0	43.0	39.0	71.0	9.0	28.0	39.0	10.0	29.0
Total Split (%)	9.2%	35.8%	35.8%	32.5%	59.2%	7.5%	23.3%	32.5%	8.3%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.3	23.0	23.0	43.7	68.7	7.5	23.3	69.0	10.0	25.7
Actuated g/C Ratio	0.04	0.19	0.19	0.36	0.57	0.06	0.19	0.58	0.08	0.21
v/c Ratio	0.07	0.65	0.09	0.84	0.27	0.59	0.93	0.49	0.63	0.89
Control Delay	57.0	52.6	0.4	44.1	11.8	76.9	47.1	2.4	61.9	42.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	52.6	0.4	44.1	11.8	76.9	47.1	2.4	61.9	42.8
LOS	E	D	A	D	B	E	D	A	E	D
Approach Delay		46.1			36.8		32.6			44.3
Approach LOS		D			D		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 40 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 37.8	Intersection LOS: D
Intersection Capacity Utilization 82.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	223	33	897	169	93	59	876	506	83	910	15
Future Volume (veh/h)	5	223	33	897	169	93	59	876	506	83	910	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	225	0	906	171	79	60	885	333	84	919	10
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	271	230	862	525	243	67	1594	932	81	1667	18
Arrive On Green	0.01	0.15	0.00	0.29	0.45	0.45	0.04	0.32	0.32	0.02	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1161	536	1619	4914	1496	1619	5011	54
Grp Volume(v), veh/h	5	225	0	906	0	250	60	885	333	84	601	328
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1697	1619	1638	1496	1619	1638	1789
Q Serve(g_s), s	0.4	14.6	0.0	35.0	0.0	11.3	4.4	17.8	2.9	6.0	20.8	20.9
Cycle Q Clear(g_c), s	0.4	14.6	0.0	35.0	0.0	11.3	4.4	17.8	2.9	6.0	20.8	20.9
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	271	230	862	0	768	67	1594	932	81	1090	595
V/C Ratio(X)	0.48	0.83	0.00	1.05	0.00	0.33	0.89	0.56	0.36	1.04	0.55	0.55
Avail Cap(c_a), veh/h	94	555	472	862	0	919	67	1594	932	81	1090	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.29	0.29	0.29	0.80	0.80	0.80
Uniform Delay (d), s/veh	59.4	49.5	0.0	42.5	0.0	21.1	57.2	33.4	3.6	59.0	44.9	44.9
Incr Delay (d2), s/veh	12.4	8.9	0.0	44.9	0.0	0.3	30.3	0.4	0.3	99.8	1.6	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.9	0.0	19.6	0.0	5.4	2.6	8.1	2.9	4.9	9.7	10.8
LnGrp Delay(d),s/veh	71.8	58.4	0.0	87.4	0.0	21.4	87.5	33.8	3.9	159.5	46.5	47.8
LnGrp LOS	E	E		F		C	F	C	A	F	D	D
Approach Vol, veh/h		230			1156			1278			1013	
Approach Delay, s/veh		58.7			73.1			28.5			56.3	
Approach LOS		E			E			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	44.9	41.0	24.1	9.0	45.9	4.8	60.3
Change Period (Y+Rc), s	4.0	6.0	6.0	* 6	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	22.0	35.0	* 37	5.0	23.0	7.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	19.8	37.0	16.6	6.4	22.9	2.4	13.3
Green Ext Time (p_c), s	0.0	1.6	0.0	1.5	0.0	0.1	0.0	3.7

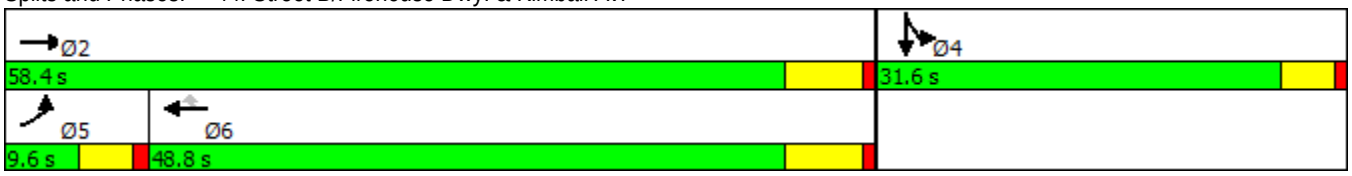
Intersection Summary	
HCM 2010 Ctrl Delay	52.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	SBT
Lane Configurations				
Traffic Volume (vph)	3	953	1353	0
Future Volume (vph)	3	953	1353	0
Turn Type	Prot	NA	NA	NA
Protected Phases	5	2	6	4
Permitted Phases				
Detector Phase	5	2	6	4
Switch Phase				
Minimum Initial (s)	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	23.2	31.6
Total Split (s)	9.6	58.4	48.8	31.6
Total Split (%)	10.7%	64.9%	54.2%	35.1%
Yellow Time (s)	3.6	5.2	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	Max	Max	None
Act Effct Green (s)	5.1	74.0	72.5	12.8
Actuated g/C Ratio	0.06	0.93	0.91	0.16
v/c Ratio	0.03	0.33	0.48	0.00
Control Delay	41.7	3.0	5.9	28.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.7	3.0	5.9	28.0
LOS	D	A	A	C
Approach Delay		3.1	5.9	28.0
Approach LOS		A	A	C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.7	Intersection LOS: A
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	953	0	0	1353	0	0	0	0	1	0	0
Future Volume (veh/h)	3	953	0	0	1353	0	0	0	0	1	0	0
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	3	1047	0	0	1487	0				1	0	0
Adj No. of Lanes	1	2	0	0	2	1				0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	7	2826	0	0	2563	1147				5	0	0
Arrive On Green	0.00	0.83	0.00	0.00	0.75	0.00				0.00	0.00	0.00
Sat Flow, veh/h	1619	3510	0	0	3510	1530				1714	0	0
Grp Volume(v), veh/h	3	1047	0	0	1487	0				1	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530				1714	0	0
Q Serve(g_s), s	0.1	4.8	0.0	0.0	12.2	0.0				0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	4.8	0.0	0.0	12.2	0.0				0.0	0.0	0.0
Prop In Lane	1.00		0.00	0.00		1.00				1.00		0.00
Lane Grp Cap(c), veh/h	7	2826	0	0	2563	1147				5	0	0
V/C Ratio(X)	0.46	0.37	0.00	0.00	0.58	0.00				0.21	0.00	0.00
Avail Cap(c_a), veh/h	128	2826	0	0	2563	1147				733	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	31.4	1.4	0.0	0.0	3.5	0.0				31.4	0.0	0.0
Incr Delay (d2), s/veh	17.2	0.4	0.0	0.0	1.0	0.0				20.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.3	0.0	0.0	5.9	0.0				0.0	0.0	0.0
LnGrp Delay(d),s/veh	48.6	1.7	0.0	0.0	4.5	0.0				52.3	0.0	0.0
LnGrp LOS	D	A			A					D		
Approach Vol, veh/h		1050			1487						1	
Approach Delay, s/veh		1.9			4.5						52.3	
Approach LOS		A			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		58.4		4.8	4.9	53.5		
Change Period (Y+Rc), s		6.2		4.6	4.6	6.2		
Max Green Setting (Gmax), s		52.2		27.0	5.0	42.6		
Max Q Clear Time (g_c+I1), s		6.8		2.0	2.1	14.2		
Green Ext Time (p_c), s		28.4		0.0	0.0	20.7		

Intersection Summary	
HCM 2010 Ctrl Delay	3.4
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	398	410	5	464	19	20	96	13
Future Volume (vph)	398	410	5	464	19	20	96	13
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	31.0	48.8	9.6	27.4	31.6	31.6	31.6	31.6
Total Split (%)	34.4%	54.2%	10.7%	30.4%	35.1%	35.1%	35.1%	35.1%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	23.7	45.8	5.1	19.0		22.0		22.0
Actuated g/C Ratio	0.29	0.57	0.06	0.24		0.27		0.27
v/c Ratio	0.88	0.23	0.05	0.80		0.15		0.81
Control Delay	50.5	10.2	41.4	39.0		24.3		45.5
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	50.5	10.2	41.4	39.0		24.3		45.5
LOS	D	B	D	D		C		D
Approach Delay		29.8		39.0		24.3		45.5
Approach LOS		C		D		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 79.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	398	410	11	5	464	124	19	20	18	96	13	192
Future Volume (veh/h)	398	410	11	5	464	124	19	20	18	96	13	192
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	419	432	12	5	488	131	20	21	19	101	14	202
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	460	1777	49	11	653	174	157	158	115	168	37	242
Arrive On Green	0.28	0.52	0.52	0.01	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1619	3397	94	1619	2657	708	355	629	456	402	146	963
Grp Volume(v), veh/h	419	217	227	5	313	306	60	0	0	317	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1781	1619	1710	1655	1440	0	0	1511	0	0
Q Serve(g_s), s	17.6	4.9	4.9	0.2	11.9	12.0	0.0	0.0	0.0	11.2	0.0	0.0
Cycle Q Clear(g_c), s	17.6	4.9	4.9	0.2	11.9	12.0	1.9	0.0	0.0	13.9	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.43	0.33		0.32	0.32		0.64
Lane Grp Cap(c), veh/h	460	895	932	11	421	407	430	0	0	447	0	0
V/C Ratio(X)	0.91	0.24	0.24	0.47	0.74	0.75	0.14	0.00	0.00	0.71	0.00	0.00
Avail Cap(c_a), veh/h	608	1036	1079	115	516	499	625	0	0	645	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.3	9.2	9.2	34.8	24.5	24.5	20.4	0.0	0.0	24.8	0.0	0.0
Incr Delay (d2), s/veh	13.0	0.1	0.1	11.3	4.6	5.1	0.1	0.0	0.0	2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	2.3	2.4	0.1	6.1	6.0	0.9	0.0	0.0	6.1	0.0	0.0
LnGrp Delay(d),s/veh	37.4	9.3	9.3	46.1	29.1	29.6	20.6	0.0	0.0	26.9	0.0	0.0
LnGrp LOS	D	A	A	D	C	C	C			C		
Approach Vol, veh/h		863			624			60			317	
Approach Delay, s/veh		22.9			29.5			20.6			26.9	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	43.0		22.3	24.6	23.5		22.3
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	42.6		27.0	26.4	21.2		27.0
Max Q Clear Time (g_c+I1), s	2.2	6.9		15.9	19.6	14.0		3.9
Green Ext Time (p_c), s	0.0	6.5		1.6	0.4	3.3		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	230	194	293	465	120	255
Future Volume (vph)	230	194	293	465	120	255
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	24.0	56.8	32.8	32.8
Total Split (%)	36.9%	36.9%	26.7%	63.1%	36.4%	36.4%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	15.6	13.9	17.4	35.2	13.0	13.0
Actuated g/C Ratio	0.25	0.23	0.28	0.57	0.21	0.21
v/c Ratio	0.61	0.41	0.69	0.49	0.34	0.51
Control Delay	28.4	6.4	32.5	10.4	24.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	6.4	32.5	10.4	24.8	7.0
LOS	C	A	C	B	C	A
Approach Delay				19.0	12.7	
Approach LOS				B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 61.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 48.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	0	194	0	0	0	293	465	0	0	120	255
Future Volume (veh/h)	230	0	194	0	0	0	293	465	0	0	120	255
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	247	0	209				315	500	0	0	129	274
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	317	0	300				370	1078	0	0	503	428
Arrive On Green	0.20	0.00	0.20				0.23	0.60	0.00	0.00	0.28	0.28
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1530
Grp Volume(v), veh/h	247	0	209				315	500	0	0	129	274
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1530
Q Serve(g_s), s	7.3	0.0	6.5				9.4	7.8	0.0	0.0	2.8	8.0
Cycle Q Clear(g_c), s	7.3	0.0	6.5				9.4	7.8	0.0	0.0	2.8	8.0
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	317	0	300				370	1078	0	0	503	428
V/C Ratio(X)	0.78	0.00	0.70				0.85	0.46	0.00	0.00	0.26	0.64
Avail Cap(c_a), veh/h	913	0	863				619	1810	0	0	958	814
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	19.0				18.7	5.6	0.0	0.0	14.2	16.0
Incr Delay (d2), s/veh	1.6	0.0	1.1				2.6	0.3	0.0	0.0	0.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	5.4				4.5	3.8	0.0	0.0	1.4	6.8
LnGrp Delay(d),s/veh	20.9	0.0	20.1				21.3	6.0	0.0	0.0	14.5	17.6
LnGrp LOS	C		C				C	A			B	B
Approach Vol, veh/h		456						815			403	
Approach Delay, s/veh		20.5						11.9			16.6	
Approach LOS		C						B			B	

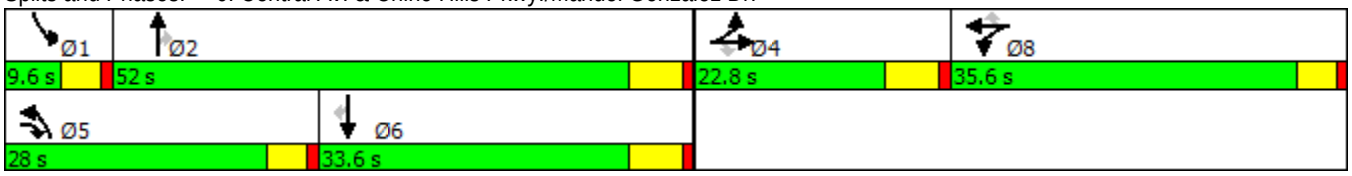
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		36.2		14.5	16.2	20.0		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		51.0		28.6	19.4	27.0		
Max Q Clear Time (g_c+I1), s		9.8		9.3	11.4	10.0		
Green Ext Time (p_c), s		5.0		0.6	0.3	4.2		

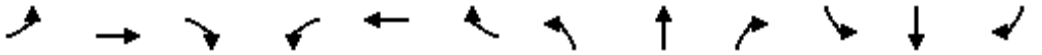
Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	504	2	420	12	42	34	320	762	1	11	860	236
Future Volume (vph)	504	2	420	12	42	34	320	762	1	11	860	236
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	5	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	22.8	22.8	28.0	35.6	35.6	35.6	28.0	52.0	52.0	9.6	33.6	33.6
Total Split (%)	19.0%	19.0%	23.3%	29.7%	29.7%	29.7%	23.3%	43.3%	43.3%	8.0%	28.0%	28.0%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	17.2	17.2	43.2	13.6	13.6	13.6	23.7	54.9	54.9	5.1	28.2	28.2
Actuated g/C Ratio	0.17	0.17	0.43	0.14	0.14	0.14	0.24	0.55	0.55	0.05	0.28	0.28
v/c Ratio	1.04	0.99	0.50	0.06	0.19	0.11	0.91	0.44	0.00	0.15	0.97	0.48
Control Delay	110.0	95.5	3.2	37.7	40.3	0.6	68.9	17.3	0.0	54.5	61.0	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.0	95.5	3.2	37.7	40.3	0.6	68.9	17.3	0.0	54.5	61.0	17.5
LOS	F	F	A	D	D	A	E	B	A	D	E	B
Approach Delay		57.6			24.7			32.5			51.7	
Approach LOS		E			C			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 46.2	Intersection LOS: D
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	504	2	420	12	42	34	320	762	1	11	860	236
Future Volume (veh/h)	504	2	420	12	42	34	320	762	1	11	860	236
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	549	0	329	13	46	20	348	828	1	12	935	187
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	564	0	621	156	174	147	375	1717	767	23	974	430
Arrive On Green	0.17	0.00	0.17	0.10	0.10	0.10	0.23	0.50	0.50	0.01	0.28	0.28
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	549	0	329	13	46	20	348	828	1	12	935	187
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	16.5	0.0	15.9	0.7	2.3	1.2	20.5	15.5	0.0	0.7	26.3	9.9
Cycle Q Clear(g_c), s	16.5	0.0	15.9	0.7	2.3	1.2	20.5	15.5	0.0	0.7	26.3	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	564	0	621	156	174	147	375	1717	767	23	974	430
V/C Ratio(X)	0.97	0.00	0.53	0.08	0.26	0.14	0.93	0.48	0.00	0.52	0.96	0.44
Avail Cap(c_a), veh/h	564	0	621	514	572	483	388	1717	767	83	974	430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	22.0	40.2	40.9	40.4	36.7	16.0	12.1	47.8	34.4	28.5
Incr Delay (d2), s/veh	31.2	0.0	0.9	0.2	0.8	0.4	27.3	1.0	0.0	6.6	20.7	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	0.0	6.8	0.3	1.2	0.5	12.0	7.5	0.0	0.4	15.1	4.5
LnGrp Delay(d),s/veh	71.3	0.0	22.8	40.4	41.7	40.8	64.1	16.9	12.1	54.4	55.0	31.7
LnGrp LOS	E		C	D	D	D	E	B	B	D	E	C
Approach Vol, veh/h		878			79			1177			1134	
Approach Delay, s/veh		53.1			41.2			30.9			51.2	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	54.8		22.8	27.2	33.6		14.0
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	46.2		17.0	23.4	27.8		31.0
Max Q Clear Time (g_c+I1), s	2.7	17.5		18.5	22.5	28.3		4.3
Green Ext Time (p_c), s	0.0	19.8		0.0	0.1	0.0		0.3

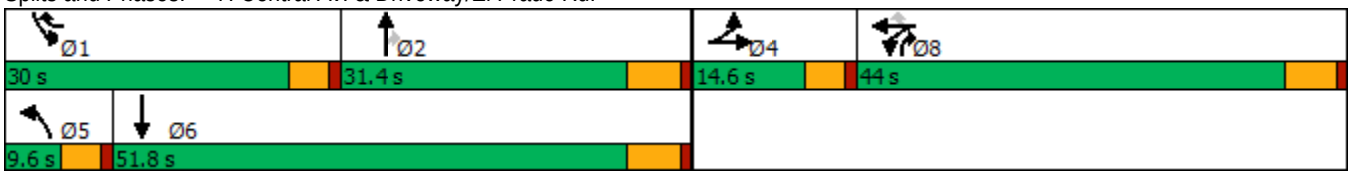
Intersection Summary	
HCM 2010 Ctrl Delay	44.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	27	5	739	4	464	9	583	834	577	723
Future Volume (vph)	27	5	739	4	464	9	583	834	577	723
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	44.0	44.0	30.0	9.6	31.4	44.0	30.0	51.8
Total Split (%)	12.2%	12.2%	36.7%	36.7%	25.0%	8.0%	26.2%	36.7%	25.0%	43.2%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.2	10.2	34.5	34.5	64.2	5.1	26.2	60.7	23.8	52.9
Actuated g/C Ratio	0.09	0.09	0.31	0.31	0.57	0.05	0.23	0.54	0.21	0.47
v/c Ratio	0.19	0.17	0.82	0.77	0.50	0.12	0.76	0.88	0.90	0.33
Control Delay	54.7	25.8	51.7	47.9	9.5	59.2	49.4	22.0	62.5	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	25.8	51.7	47.9	9.5	59.2	49.4	22.0	62.5	20.9
LOS	D	C	D	D	A	E	D	C	E	C
Approach Delay		40.5		34.3			33.4			39.1
Approach LOS		D		C			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 93.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	5	21	739	4	464	9	583	834	577	723	18
Future Volume (veh/h)	27	5	21	739	4	464	9	583	834	577	723	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	28	5	13	773	0	332	9	607	693	601	753	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	114	31	81	901	0	748	18	832	792	662	2196	44
Arrive On Green	0.07	0.07	0.07	0.28	0.00	0.28	0.01	0.24	0.24	0.21	0.44	0.44
Sat Flow, veh/h	1619	443	1153	3238	0	1530	1619	3420	1508	3141	4958	99
Grp Volume(v), veh/h	28	0	18	773	0	332	9	607	693	601	497	271
Grp Sat Flow(s),veh/h/ln	1619	0	1597	1619	0	1530	1619	1710	1508	1570	1638	1780
Q Serve(g_s), s	1.7	0.0	1.1	23.8	0.0	14.9	0.6	17.2	25.6	19.7	10.5	10.5
Cycle Q Clear(g_c), s	1.7	0.0	1.1	23.8	0.0	14.9	0.6	17.2	25.6	19.7	10.5	10.5
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	114	0	112	901	0	748	18	832	792	662	1451	789
V/C Ratio(X)	0.25	0.00	0.16	0.86	0.00	0.44	0.51	0.73	0.87	0.91	0.34	0.34
Avail Cap(c_a), veh/h	154	0	152	1175	0	878	77	832	792	758	1451	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	0.0	46.0	36.0	0.0	17.6	51.8	36.7	18.2	40.5	19.3	19.3
Incr Delay (d2), s/veh	0.4	0.0	0.2	5.2	0.0	0.4	8.0	5.6	12.9	12.7	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	11.3	0.0	6.3	0.3	8.7	22.9	9.7	4.9	5.5
LnGrp Delay(d),s/veh	46.7	0.0	46.3	41.2	0.0	18.0	59.8	42.2	31.1	53.2	19.9	20.5
LnGrp LOS	D		D	D		B	E	D	C	D	B	C
Approach Vol, veh/h		46			1105			1309			1369	
Approach Delay, s/veh		46.5			34.2			36.5			34.6	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.8	31.4		12.0	5.8	52.4		35.1
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	25.4	25.6		10.0	5.0	46.0		38.2
Max Q Clear Time (g_c+I1), s	21.7	27.6		3.7	2.6	12.5		25.8
Green Ext Time (p_c), s	0.5	0.0		0.0	0.0	7.3		3.5

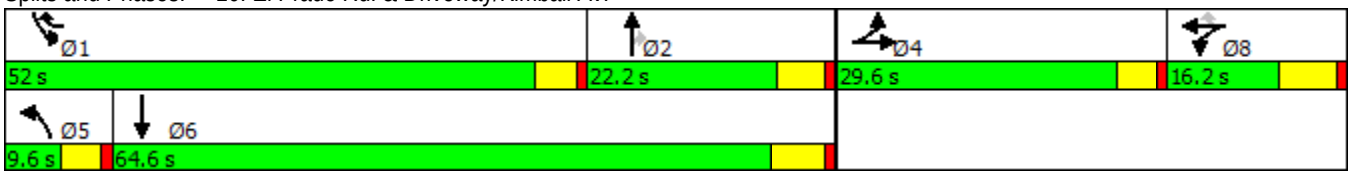
Intersection Summary	
HCM 2010 Ctrl Delay	35.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	36	8	3	844	4	206	24	994	359
Future Volume (vph)	36	8	3	844	4	206	24	994	359
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	52.0	9.6	22.2	22.2	52.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	43.3%	8.0%	18.5%	18.5%	43.3%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	14.6	14.6	12.7	40.5	6.3	16.9	16.9	33.1	42.9
Actuated g/C Ratio	0.19	0.19	0.16	0.52	0.08	0.22	0.22	0.42	0.55
v/c Ratio	0.13	0.05	0.10	0.83	0.03	0.56	0.06	0.79	0.40
Control Delay	39.8	28.9	46.2	13.7	51.2	43.8	0.2	28.2	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	28.9	46.2	13.7	51.2	43.8	0.2	28.2	15.1
LOS	D	C	D	B	D	D	A	C	B
Approach Delay		36.6	14.7			39.5			24.6
Approach LOS		D	B			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 78.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.8	Intersection LOS: C
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	8	8	23	3	844	4	206	24	994	359	14
Future Volume (veh/h)	36	8	8	23	3	844	4	206	24	994	359	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	38	8	6	24	3	437	4	217	24	1046	378	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	138	82	61	190	24	751	100	290	247	1152	803	30
Arrive On Green	0.09	0.09	0.09	0.12	0.12	0.12	0.06	0.16	0.16	0.37	0.47	0.47
Sat Flow, veh/h	1619	956	717	1532	191	1530	1619	1800	1530	3141	1725	64
Grp Volume(v), veh/h	38	0	14	27	0	437	4	217	24	1046	0	392
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1723	0	1530	1619	1800	1530	1570	0	1788
Q Serve(g_s), s	1.8	0.0	0.6	1.1	0.0	10.0	0.2	9.3	1.1	25.5	0.0	12.1
Cycle Q Clear(g_c), s	1.8	0.0	0.6	1.1	0.0	10.0	0.2	9.3	1.1	25.5	0.0	12.1
Prop In Lane	1.00		0.43	0.89		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	138	0	143	214	0	751	100	290	247	1152	0	833
V/C Ratio(X)	0.28	0.00	0.10	0.13	0.00	0.58	0.04	0.75	0.10	0.91	0.00	0.47
Avail Cap(c_a), veh/h	502	0	519	214	0	751	100	379	322	1846	0	1304
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	34.0	31.4	0.0	14.6	35.6	32.3	28.8	24.2	0.0	14.7
Incr Delay (d2), s/veh	1.1	0.0	0.3	0.3	0.0	1.1	0.1	5.8	0.2	2.9	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.3	0.5	0.0	7.2	0.1	5.0	0.5	11.5	0.0	6.0
LnGrp Delay(d),s/veh	35.6	0.0	34.3	31.7	0.0	15.8	35.6	38.0	29.0	27.2	0.0	15.1
LnGrp LOS	D		C	C		B	D	D	C	C		B
Approach Vol, veh/h		52			464			245			1438	
Approach Delay, s/veh		35.3			16.7			37.1			23.9	
Approach LOS		D			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	34.2	18.8		11.5	9.6	43.4		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	47.4	* 17		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	27.5	11.3		3.8	2.2	14.1		12.0
Green Ext Time (p_c), s	2.1	1.7		0.1	0.0	3.8		0.0

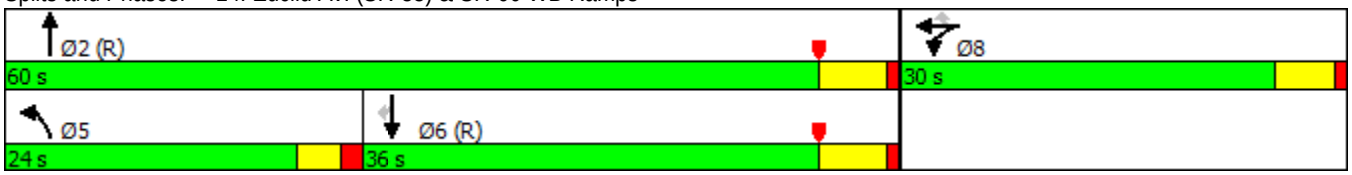
Intersection Summary	
HCM 2010 Ctrl Delay	24.1
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	640	6	422	528	1074	946	549
Future Volume (vph)	640	6	422	528	1074	946	549
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	24.0	60.0	36.0	36.0
Total Split (%)	33.3%	33.3%	33.3%	26.7%	66.7%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.3	24.3	24.3	18.4	55.2	32.3	32.3
Actuated g/C Ratio	0.27	0.27	0.27	0.20	0.61	0.36	0.36
v/c Ratio	0.94	0.91	0.78	0.87	0.54	0.81	0.64
Control Delay	66.3	57.1	36.0	41.1	18.3	33.3	5.7
Queue Delay	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Total Delay	66.3	57.1	36.0	41.1	20.0	33.3	5.7
LOS	E	E	D	D	B	C	A
Approach Delay		53.7			26.9	23.2	
Approach LOS		D			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 51 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 32.5	Intersection LOS: C
Intersection Capacity Utilization 89.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	640	6	422	528	1074	0	0	946	549
Future Volume (veh/h)	0	0	0	640	6	422	528	1074	0	0	946	549
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				766	0	195	556	1131	0	0	996	578
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				839	0	391	630	2135	0	0	1278	561
Arrive On Green				0.26	0.00	0.26	0.07	0.21	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1510	3141	3510	0	0	3510	1501
Grp Volume(v), veh/h				766	0	195	556	1131	0	0	996	578
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1570	1710	0	0	1710	1501
Q Serve(g_s), s				20.7	0.0	9.9	15.8	26.5	0.0	0.0	23.2	33.6
Cycle Q Clear(g_c), s				20.7	0.0	9.9	15.8	26.5	0.0	0.0	23.2	33.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				839	0	391	630	2135	0	0	1278	561
V/C Ratio(X)				0.91	0.00	0.50	0.88	0.53	0.00	0.00	0.78	1.03
Avail Cap(c_a), veh/h				899	0	420	681	2135	0	0	1278	561
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.51	0.51	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.4	0.0	28.4	41.0	24.0	0.0	0.0	24.9	28.2
Incr Delay (d2), s/veh				12.5	0.0	0.4	6.4	0.5	0.0	0.0	4.7	46.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.7	0.0	4.2	7.4	12.8	0.0	0.0	11.8	21.1
LnGrp Delay(d),s/veh				44.8	0.0	28.7	47.4	24.4	0.0	0.0	29.7	74.4
LnGrp LOS				D		C	D	C			C	F
Approach Vol, veh/h					961			1687			1574	
Approach Delay, s/veh					41.6			32.0			46.1	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.7			22.6	39.1		28.3
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		54.5			19.5	30.5		25.0
Max Q Clear Time (g_c+I1), s		28.5			17.8	35.6		22.7
Green Ext Time (p_c), s		22.9			0.3	0.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	39.4
HCM 2010 LOS	D

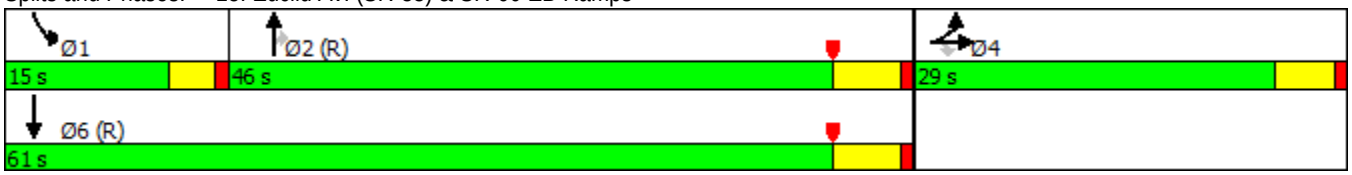
Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	392	2	552	1211	758	313	1273
Future Volume (vph)	392	2	552	1211	758	313	1273
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	29.0	46.0	46.0	15.0	61.0
Total Split (%)	32.2%	32.2%	32.2%	51.1%	51.1%	16.7%	67.8%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.2	22.2	22.2	42.2	42.2	11.1	57.3
Actuated g/C Ratio	0.25	0.25	0.25	0.47	0.47	0.12	0.64
v/c Ratio	0.89	0.80	0.74	0.77	0.70	0.83	0.60
Control Delay	58.8	41.1	34.5	24.5	5.6	49.3	2.6
Queue Delay	3.0	1.2	0.0	0.0	0.0	0.0	0.4
Total Delay	61.8	42.3	34.5	24.5	5.6	49.3	3.0
LOS	E	D	C	C	A	D	A
Approach Delay		46.6		17.3			12.1
Approach LOS		D		B			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 21.6 — Intersection LOS: C
Intersection Capacity Utilization 89.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	392	2	552	0	0	0	0	1211	758	313	1273	0
Future Volume (veh/h)	392	2	552	0	0	0	0	1211	758	313	1273	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	566	0	311				0	1236	773	319	1299	0
Adj No. of Lanes	2	0	1				0	2	1	2	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	741	0	350				0	1669	734	384	2239	0
Arrive On Green	0.23	0.00	0.23				0.00	0.49	0.49	0.08	0.44	0.00
Sat Flow, veh/h	3238	0	1530				0	3510	1505	3141	3510	0
Grp Volume(v), veh/h	566	0	311				0	1236	773	319	1299	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1505	1570	1710	0
Q Serve(g_s), s	14.7	0.0	17.7				0.0	26.1	43.9	9.0	25.7	0.0
Cycle Q Clear(g_c), s	14.7	0.0	17.7				0.0	26.1	43.9	9.0	25.7	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	741	0	350				0	1669	734	384	2239	0
V/C Ratio(X)	0.76	0.00	0.89				0.00	0.74	1.05	0.83	0.58	0.00
Avail Cap(c_a), veh/h	863	0	408				0	1669	734	384	2239	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.58	0.58	0.41	0.41	0.00
Uniform Delay (d), s/veh	32.4	0.0	33.6				0.0	18.5	23.0	40.4	16.0	0.0
Incr Delay (d2), s/veh	2.8	0.0	17.2				0.0	1.8	40.4	6.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	0.0	9.1				0.0	12.6	26.4	4.2	12.3	0.0
LnGrp Delay(d),s/veh	35.2	0.0	50.8				0.0	20.2	63.4	46.5	16.4	0.0
LnGrp LOS	D		D					C	F	D	B	
Approach Vol, veh/h		877						2009			1618	
Approach Delay, s/veh		40.7						36.9			22.3	
Approach LOS		D						D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.0	49.4		25.6		64.4		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	11.0	40.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	11.0	45.9		19.7		27.7		
Green Ext Time (p_c), s	0.0	0.0		0.9		26.3		

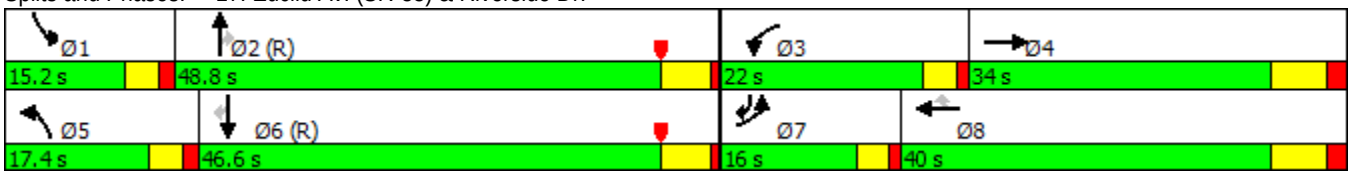
Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	152	391	178	351	56	108	1513	278	132	1193	168
Future Volume (vph)	152	391	178	351	56	108	1513	278	132	1193	168
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	16.0	34.0	22.0	40.0	40.0	17.4	48.8	48.8	15.2	46.6	16.0
Total Split (%)	13.3%	28.3%	18.3%	33.3%	33.3%	14.5%	40.7%	40.7%	12.7%	38.8%	13.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.8	24.0	16.5	27.7	27.7	12.1	45.3	45.3	13.3	46.4	60.7
Actuated g/C Ratio	0.11	0.20	0.14	0.23	0.23	0.10	0.38	0.38	0.11	0.39	0.51
v/c Ratio	0.95	0.76	0.86	0.48	0.14	0.71	0.88	0.41	0.80	0.68	0.21
Control Delay	110.5	50.9	83.5	41.0	2.2	55.4	49.3	16.7	67.9	29.1	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.5	50.9	83.5	41.0	2.2	55.4	49.3	16.7	67.9	29.1	11.2
LOS	F	D	F	D	A	E	D	B	E	C	B
Approach Delay		65.2		50.3			44.9			30.5	
Approach LOS		E		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 43.7	Intersection LOS: D
Intersection Capacity Utilization 82.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	391	91	178	351	56	108	1513	278	132	1193	168
Future Volume (veh/h)	152	391	91	178	351	56	108	1513	278	132	1193	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	163	420	64	191	377	60	116	1627	168	142	1283	83
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	558	85	215	753	332	140	2042	636	144	2055	784
Arrive On Green	0.10	0.19	0.19	0.13	0.22	0.22	0.03	0.14	0.14	0.03	0.14	0.14
Sat Flow, veh/h	1619	2979	451	1619	3420	1507	1619	4914	1530	1619	4914	1508
Grp Volume(v), veh/h	163	240	244	191	377	60	116	1627	168	142	1283	83
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	1507	1619	1638	1530	1619	1638	1508
Q Serve(g_s), s	12.0	15.9	16.1	13.9	11.6	3.9	8.6	38.5	11.8	10.5	29.6	4.8
Cycle Q Clear(g_c), s	12.0	15.9	16.1	13.9	11.6	3.9	8.6	38.5	11.8	10.5	29.6	4.8
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	320	322	215	753	332	140	2042	636	144	2055	784
V/C Ratio(X)	1.01	0.75	0.76	0.89	0.50	0.18	0.83	0.80	0.26	0.98	0.62	0.11
Avail Cap(c_a), veh/h	162	385	387	243	941	414	174	2042	636	144	2055	784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.47	0.47	0.47	0.76	0.76	0.76
Uniform Delay (d), s/veh	54.0	46.1	46.2	51.2	41.0	38.0	57.4	46.9	35.3	58.1	42.8	22.3
Incr Delay (d2), s/veh	72.5	7.5	7.9	26.4	0.7	0.4	12.0	1.6	0.5	60.5	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	8.2	8.4	7.8	5.6	1.6	4.3	17.8	5.1	7.1	13.7	2.1
LnGrp Delay(d),s/veh	126.5	53.6	54.1	77.6	41.7	38.4	69.4	48.5	35.8	118.6	43.9	22.6
LnGrp LOS	F	D	D	E	D	D	E	D	D	F	D	C
Approach Vol, veh/h		647			628			1911			1508	
Approach Delay, s/veh		72.2			52.3			48.6			49.8	
Approach LOS		E			D			D			D	

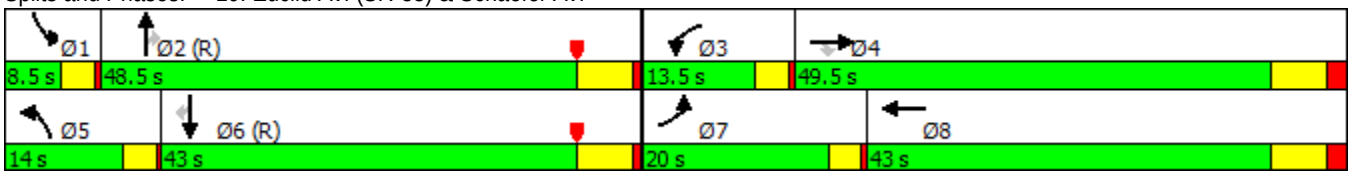
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	55.4	19.9	29.5	14.9	55.7	16.0	33.4
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	10.7	43.3	18.0	27.0	12.9	41.1	12.0	33.0
Max Q Clear Time (g_c+I1), s	12.5	40.5	15.9	18.1	10.6	31.6	14.0	13.6
Green Ext Time (p_c), s	0.0	2.7	0.1	4.4	0.1	8.8	0.0	7.0

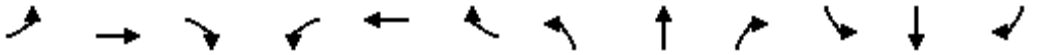
Intersection Summary	
HCM 2010 Ctrl Delay	52.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	306	230	189	27	50	120	1819	41	23	1323	134
Future Volume (vph)	306	230	189	27	50	120	1819	41	23	1323	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	20.0	49.5	49.5	13.5	43.0	14.0	48.5	48.5	8.5	43.0	43.0
Total Split (%)	16.7%	41.3%	41.3%	11.3%	35.8%	11.7%	40.4%	40.4%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	16.6	25.6	25.6	10.0	16.0	13.2	67.5	67.5	5.7	56.6	56.6
Actuated g/C Ratio	0.14	0.21	0.21	0.08	0.13	0.11	0.56	0.56	0.05	0.47	0.47
v/c Ratio	1.41	0.62	0.41	0.21	0.28	0.70	0.68	0.05	0.32	0.59	0.17
Control Delay	248.4	48.6	6.9	55.4	37.0	52.1	32.7	3.1	61.8	27.6	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	248.4	48.6	6.9	55.4	37.0	52.1	32.7	3.1	61.8	27.6	8.3
LOS	F	D	A	E	D	D	C	A	E	C	A
Approach Delay		122.0			42.5		33.3			26.4	
Approach LOS		F			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.41	
Intersection Signal Delay: 46.1	Intersection LOS: D
Intersection Capacity Utilization 81.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	230	189	27	50	15	120	1819	41	23	1323	134
Future Volume (veh/h)	306	230	189	27	50	15	120	1819	41	23	1323	134
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	315	237	119	28	52	10	124	1875	33	24	1364	85
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	282	240	82	103	20	142	2963	923	37	2646	805
Arrive On Green	0.14	0.16	0.16	0.05	0.07	0.07	0.06	0.40	0.40	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1468	282	1619	4914	1530	1619	4914	1496
Grp Volume(v), veh/h	315	237	119	28	0	62	124	1875	33	24	1364	85
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1750	1619	1638	1530	1619	1638	1496
Q Serve(g_s), s	16.5	15.3	8.5	2.0	0.0	4.1	9.1	36.7	1.6	1.8	30.2	5.7
Cycle Q Clear(g_c), s	16.5	15.3	8.5	2.0	0.0	4.1	9.1	36.7	1.6	1.8	30.2	5.7
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	282	240	82	0	122	142	2963	923	37	2646	805
V/C Ratio(X)	1.41	0.84	0.50	0.34	0.00	0.51	0.88	0.63	0.04	0.65	0.52	0.11
Avail Cap(c_a), veh/h	223	638	542	135	0	525	142	2963	923	67	2646	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.57	0.57	0.57	0.70	0.70	0.70
Uniform Delay (d), s/veh	51.8	49.1	46.2	55.0	0.0	53.8	55.8	25.1	14.7	59.1	35.2	25.1
Incr Delay (d2), s/veh	211.1	5.0	1.2	0.9	0.0	2.4	26.7	0.6	0.0	4.8	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.4	8.0	3.7	0.9	0.0	2.1	5.1	16.8	0.7	0.8	13.8	2.4
LnGrp Delay(d),s/veh	262.9	54.1	47.4	56.0	0.0	56.2	82.6	25.7	14.7	63.9	35.7	25.3
LnGrp LOS	F	D	D	E		E	F	C	B	E	D	C
Approach Vol, veh/h		671			90			2032			1473	
Approach Delay, s/veh		150.9			56.1			29.0			35.5	
Approach LOS		F			E			C			D	

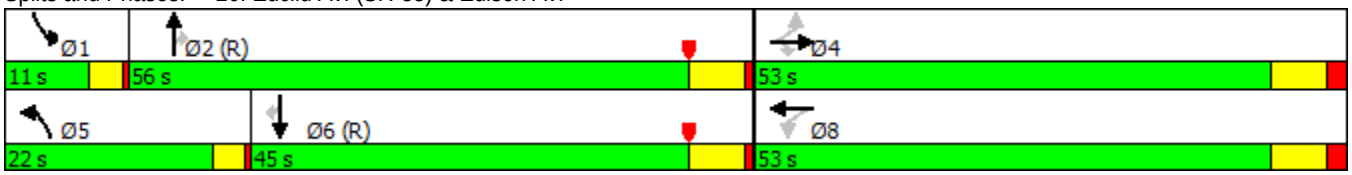
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	78.4	9.6	25.8	14.0	70.6	20.0	15.4
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	42.5	10.0	42.5	10.5	37.0	16.5	36.0
Max Q Clear Time (g_c+I1), s	3.8	38.7	4.0	17.3	11.1	32.2	18.5	6.1
Green Ext Time (p_c), s	0.0	3.7	0.0	1.5	0.0	4.7	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	51.0
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	350	480	283	29	143	167	1563	78	70	1292	172
Future Volume (vph)	350	480	283	29	143	167	1563	78	70	1292	172
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	22.0	56.0	56.0	11.0	45.0	45.0
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%	18.3%	46.7%	46.7%	9.2%	37.5%	37.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.4	43.4	43.4	43.4	43.4	15.8	54.6	54.6	7.4	44.3	44.3
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.13	0.46	0.46	0.06	0.37	0.37
v/c Ratio	0.93	0.75	0.40	0.20	0.28	0.80	0.71	0.11	0.72	0.73	0.27
Control Delay	69.0	41.5	4.5	29.1	26.0	56.8	28.8	11.1	113.8	15.7	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.0	41.5	4.5	29.1	26.0	56.8	28.8	11.1	113.8	15.7	2.3
LOS	E	D	A	C	C	E	C	B	F	B	A
Approach Delay		40.7			26.4		30.6			18.6	
Approach LOS		D			C		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 28.9	Intersection LOS: C
Intersection Capacity Utilization 88.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	480	283	29	143	31	167	1563	78	70	1292	172
Future Volume (veh/h)	350	480	283	29	143	31	167	1563	78	70	1292	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	357	490	197	30	146	27	170	1595	60	71	1318	149
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	427	690	578	171	567	105	196	2089	651	87	1759	548
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.14	0.14	0.11	0.72	0.72
Sat Flow, veh/h	1163	1800	1508	724	1478	273	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	357	490	197	30	0	173	170	1595	60	71	1318	149
Grp Sat Flow(s),veh/h/ln	1163	1800	1508	724	0	1752	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	36.4	27.7	11.1	4.4	0.0	8.1	12.5	37.5	4.1	5.1	19.7	4.1
Cycle Q Clear(g_c), s	44.5	27.7	11.1	32.1	0.0	8.1	12.5	37.5	4.1	5.1	19.7	4.1
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	427	690	578	171	0	672	196	2089	651	87	1759	548
V/C Ratio(X)	0.84	0.71	0.34	0.18	0.00	0.26	0.87	0.76	0.09	0.81	0.75	0.27
Avail Cap(c_a), veh/h	427	690	578	171	0	672	250	2089	651	101	1759	548
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.64	0.64	0.64	0.81	0.81	0.81
Uniform Delay (d), s/veh	40.5	31.4	26.2	44.9	0.0	25.3	56.6	45.8	31.4	52.9	13.8	11.5
Incr Delay (d2), s/veh	13.5	3.4	0.3	0.5	0.0	0.2	13.0	1.8	0.2	25.1	2.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.3	14.4	4.7	0.9	0.0	3.9	6.3	17.4	1.8	2.9	8.9	1.8
LnGrp Delay(d),s/veh	54.0	34.7	26.6	45.4	0.0	25.5	69.6	47.5	31.6	78.0	16.2	12.5
LnGrp LOS	D	C	C	D		C	E	D	C	E	B	B
Approach Vol, veh/h		1044			203			1825			1538	
Approach Delay, s/veh		39.8			28.5			49.1			18.7	
Approach LOS		D			C			D			B	

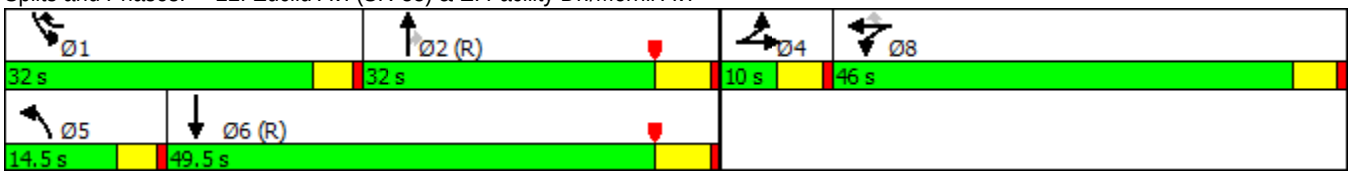
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	57.0		53.0	18.1	48.9		53.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	50.0		46.0	18.5	39.0		46.0
Max Q Clear Time (g_c+I1), s	7.1	39.5		46.5	14.5	21.7		34.1
Green Ext Time (p_c), s	0.0	9.6		0.0	0.1	15.0		4.9

Intersection Summary	
HCM 2010 Ctrl Delay	35.9
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	21	0	457	2	1423	350	690	1082
Future Volume (vph)	21	0	457	2	1423	350	690	1082
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	32.0	14.5	32.0	32.0	32.0	49.5
Total Split (%)	8.3%	38.3%	26.7%	12.1%	26.7%	26.7%	26.7%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	22.2	59.9	10.0	41.6	41.6	32.7	75.9
Actuated g/C Ratio	0.04	0.18	0.50	0.08	0.35	0.35	0.27	0.63
v/c Ratio	0.48	0.62	0.59	0.01	0.90	0.61	0.84	0.37
Control Delay	62.1	52.2	16.2	63.5	37.2	18.1	43.6	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	52.2	16.2	63.5	37.2	18.1	43.6	5.0
LOS	E	D	B	E	D	B	D	A
Approach Delay	62.1	26.5			33.5			20.0
Approach LOS	E	C			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 87.5 (73%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 27.0	Intersection LOS: C
Intersection Capacity Utilization 81.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	11	182	0	457	2	1423	350	690	1082	1
Future Volume (veh/h)	5	21	11	182	0	457	2	1423	350	690	1082	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1768	1800	1800
Adj Flow Rate, veh/h	5	23	4	196	0	463	2	1530	347	742	1163	1
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	34	6	432	0	736	9	1576	484	749	2761	2
Arrive On Green	0.03	0.03	0.03	0.25	0.00	0.25	0.01	0.32	0.32	0.23	0.54	0.54
Sat Flow, veh/h	273	1256	218	1714	0	1530	1619	4914	1510	3267	5071	4
Grp Volume(v), veh/h	32	0	0	196	0	463	2	1530	347	742	751	413
Grp Sat Flow(s),veh/h/ln	1748	0	0	1714	0	1530	1619	1638	1510	1633	1638	1799
Q Serve(g_s), s	2.2	0.0	0.0	11.6	0.0	27.0	0.1	36.9	24.3	27.2	16.3	16.3
Cycle Q Clear(g_c), s	2.2	0.0	0.0	11.6	0.0	27.0	0.1	36.9	24.3	27.2	16.3	16.3
Prop In Lane	0.16		0.12	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	48	0	0	432	0	736	9	1576	484	749	1784	980
V/C Ratio(X)	0.67	0.00	0.00	0.45	0.00	0.63	0.23	0.97	0.72	0.99	0.42	0.42
Avail Cap(c_a), veh/h	73	0	0	586	0	873	135	1576	484	749	1784	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.70	0.70	0.70	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.8	0.0	0.0	37.9	0.0	23.2	59.4	40.2	36.0	46.1	16.2	16.2
Incr Delay (d2), s/veh	5.9	0.0	0.0	0.3	0.0	0.6	3.5	13.3	6.3	30.6	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	5.5	0.0	11.5	0.1	18.7	11.0	15.4	7.5	8.4
LnGrp Delay(d),s/veh	63.7	0.0	0.0	38.2	0.0	23.7	62.9	53.5	42.3	76.7	16.9	17.5
LnGrp LOS	E			D		C	E	D	D	E	B	B
Approach Vol, veh/h		32			659			1879			1906	
Approach Delay, s/veh		63.7			28.0			51.5			40.3	
Approach LOS		E			C			D			D	

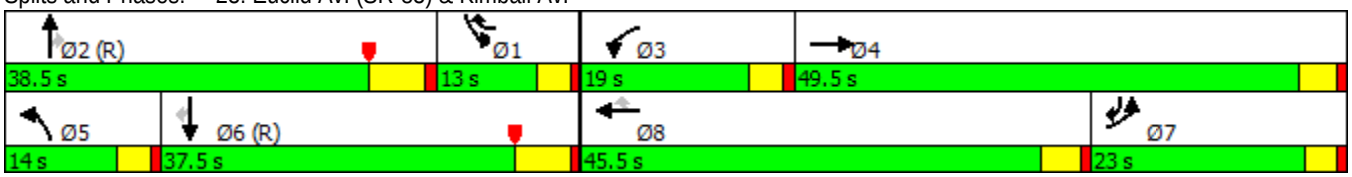
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	32.0	44.5		8.3	5.1	71.3		35.2
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	27.5	26.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	29.2	38.9		4.2	2.1	18.3		29.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	19.9		1.2

Intersection Summary		
HCM 2010 Ctrl Delay		43.3
HCM 2010 LOS		D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	629	798	206	339	278	125	814	154	245	882	201
Future Volume (vph)	629	798	206	339	278	125	814	154	245	882	201
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	1	5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	9.0	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	23.0	49.5	19.0	45.5	13.0	14.0	38.5	38.5	13.0	37.5	23.0
Total Split (%)	19.2%	41.3%	15.8%	37.9%	10.8%	11.7%	32.1%	32.1%	10.8%	31.3%	19.2%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	36.6	42.0	15.5	20.8	39.2	12.9	30.2	30.2	13.9	31.2	69.8
Actuated g/C Ratio	0.30	0.35	0.13	0.17	0.33	0.11	0.25	0.25	0.12	0.26	0.58
v/c Ratio	0.69	0.77	1.04	0.60	0.51	0.75	0.69	0.32	0.71	0.72	0.22
Control Delay	42.6	39.6	123.8	48.7	22.6	73.0	22.8	2.7	52.8	33.8	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	39.6	123.8	48.7	22.6	73.0	22.8	2.7	52.8	33.8	5.9
LOS	D	D	F	D	C	E	C	A	D	C	A
Approach Delay		40.9		58.7			25.7			33.1	
Approach LOS		D		E			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 38.3	Intersection LOS: D
Intersection Capacity Utilization 80.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	629	798	82	206	339	278	125	814	154	245	882	201
Future Volume (veh/h)	629	798	82	206	339	278	125	814	154	245	882	201
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	655	831	81	215	353	256	130	848	145	255	919	191
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	899	932	91	202	446	507	135	1019	317	631	1679	954
Arrive On Green	0.29	0.30	0.30	0.13	0.13	0.13	0.17	0.41	0.41	0.20	0.34	0.34
Sat Flow, veh/h	3141	3149	307	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	655	451	461	215	353	256	130	848	145	255	919	191
Grp Sat Flow(s),veh/h/ln	1570	1710	1746	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	22.6	30.3	30.3	15.0	12.0	0.0	9.6	18.5	6.1	8.5	18.2	2.0
Cycle Q Clear(g_c), s	22.6	30.3	30.3	15.0	12.0	0.0	9.6	18.5	6.1	8.5	18.2	2.0
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	899	506	517	202	446	507	135	1019	317	631	1679	954
V/C Ratio(X)	0.73	0.89	0.89	1.06	0.79	0.50	0.96	0.83	0.46	0.40	0.55	0.20
Avail Cap(c_a), veh/h	899	641	655	202	1169	830	135	1331	414	631	1679	954
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.40	0.40	0.40	1.00	1.00	1.00	0.74	0.74	0.74	0.92	0.92	0.92
Uniform Delay (d), s/veh	38.6	40.4	40.4	52.5	50.6	32.2	49.8	33.3	16.4	41.7	32.0	2.9
Incr Delay (d2), s/veh	1.1	5.6	5.5	80.7	1.2	0.3	55.5	6.0	3.5	0.1	1.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	15.1	15.4	11.2	5.8	6.8	6.3	8.9	2.8	3.7	8.4	1.3
LnGrp Delay(d),s/veh	39.7	46.0	45.9	133.2	51.8	32.5	105.3	39.3	19.9	41.8	33.2	3.3
LnGrp LOS	D	D	D	F	D	C	F	D	B	D	C	A
Approach Vol, veh/h		1567			824			1123			1365	
Approach Delay, s/veh		43.3			67.0			44.4			30.6	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.1	30.9	19.0	40.0	14.0	47.0	38.8	20.2
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.5	* 4.5
Max Green Setting (Gmax), s	9.0	* 33	15.0	45.0	10.0	31.5	19.0	* 41
Max Q Clear Time (g_c+I1), s	10.5	20.5	17.0	32.3	11.6	20.2	24.6	14.0
Green Ext Time (p_c), s	0.0	4.4	0.0	3.2	0.0	5.0	0.0	1.7

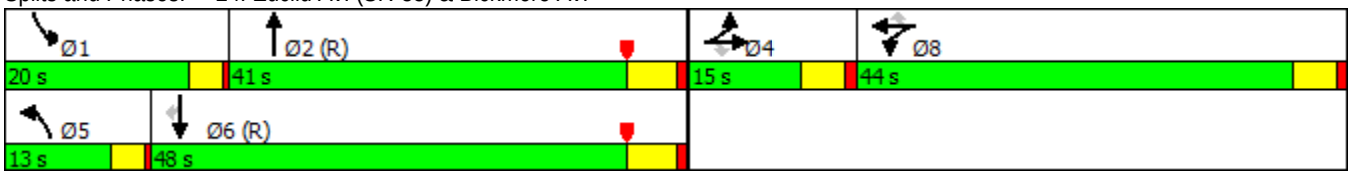
Intersection Summary	
HCM 2010 Ctrl Delay	44.0
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	116	120	119	90	43	116	47	866	217	838	78
Future Volume (vph)	116	120	119	90	43	116	47	866	217	838	78
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	15.0	15.0	15.0	44.0	44.0	44.0	13.0	41.0	20.0	48.0	48.0
Total Split (%)	12.5%	12.5%	12.5%	36.7%	36.7%	36.7%	10.8%	34.2%	16.7%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	10.0	10.0	15.0	15.0	15.0	7.9	51.1	24.9	69.9	69.9
Actuated g/C Ratio	0.08	0.08	0.08	0.12	0.12	0.12	0.07	0.43	0.21	0.58	0.58
v/c Ratio	0.96	0.89	0.53	0.38	0.36	0.42	0.50	0.84	0.72	0.47	0.10
Control Delay	123.6	103.2	17.1	50.1	49.0	10.0	84.3	18.6	45.1	11.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.6	103.2	17.1	50.1	49.0	10.0	84.3	18.6	45.1	11.3	4.4
LOS	F	F	B	D	D	A	F	B	D	B	A
Approach Delay		81.1			31.1			21.4		17.3	
Approach LOS		F			C			C		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 105 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 28.0	Intersection LOS: C
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	120	119	90	43	116	47	866	205	217	838	78
Future Volume (veh/h)	116	120	119	90	43	116	47	866	205	217	838	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	129	133	113	74	84	117	52	962	218	241	931	87
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	150	127	155	173	147	64	1449	328	223	2129	933
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.08	1.00	1.00	0.09	0.42	0.42
Sat Flow, veh/h	1619	1800	1530	1619	1800	1530	1619	2760	624	1619	3420	1498
Grp Volume(v), veh/h	129	133	113	74	84	117	52	595	585	241	931	87
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1619	1710	1674	1619	1710	1498
Q Serve(g_s), s	9.5	8.8	8.8	5.2	5.3	9.0	3.8	0.0	0.0	16.5	23.3	4.2
Cycle Q Clear(g_c), s	9.5	8.8	8.8	5.2	5.3	9.0	3.8	0.0	0.0	16.5	23.3	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	135	150	127	155	173	147	64	898	879	223	2129	933
V/C Ratio(X)	0.96	0.89	0.89	0.48	0.49	0.80	0.81	0.66	0.67	1.08	0.44	0.09
Avail Cap(c_a), veh/h	135	150	127	526	585	497	128	898	879	223	2129	933
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.25	0.25	0.25	0.53	0.53	0.53
Uniform Delay (d), s/veh	54.8	54.4	54.4	51.4	51.4	53.1	54.8	0.0	0.0	54.5	20.0	14.4
Incr Delay (d2), s/veh	63.4	41.1	45.9	0.8	0.8	3.7	2.3	1.0	1.0	68.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	6.1	5.3	2.4	2.7	3.9	1.7	0.2	0.3	11.6	11.1	1.8
LnGrp Delay(d),s/veh	118.2	95.6	100.3	52.2	52.2	56.8	57.1	1.0	1.0	122.4	20.3	14.5
LnGrp LOS	F	F	F	D	D	E	E	A	A	F	C	B
Approach Vol, veh/h		375			275			1232			1259	
Approach Delay, s/veh		104.8			54.2			3.4			39.5	
Approach LOS		F			D			A			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.0	68.5		15.0	8.3	80.2		16.5
Change Period (Y+Rc), s	3.5	5.5		5.0	3.5	5.5		5.0
Max Green Setting (Gmax), s	16.5	35.5		10.0	9.5	42.5		39.0
Max Q Clear Time (g_c+I1), s	18.5	2.0		11.5	5.8	25.3		11.0
Green Ext Time (p_c), s	0.0	10.4		0.0	0.0	8.1		0.5

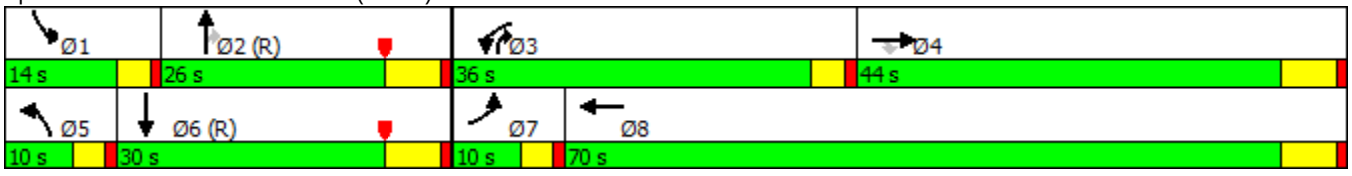
Intersection Summary	
HCM 2010 Ctrl Delay	34.4
HCM 2010 LOS	C

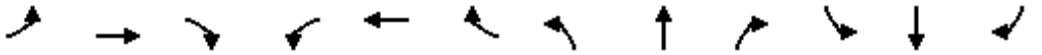
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	346	29	484	78	34	992	1095	105	890
Future Volume (vph)	15	346	29	484	78	34	992	1095	105	890
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	10.0	44.0	44.0	36.0	70.0	10.0	26.0	36.0	14.0	30.0
Total Split (%)	8.3%	36.7%	36.7%	30.0%	58.3%	8.3%	21.7%	30.0%	11.7%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.5	30.0	30.0	32.0	62.0	6.4	26.6	64.6	11.4	35.4
Actuated g/C Ratio	0.05	0.25	0.25	0.27	0.52	0.05	0.22	0.54	0.10	0.30
v/c Ratio	0.20	0.80	0.06	0.63	0.16	0.41	0.94	1.21	0.70	0.64
Control Delay	61.5	54.9	0.2	43.2	10.0	68.0	44.7	113.2	70.4	48.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	54.9	0.2	43.2	10.0	68.0	44.7	113.2	70.4	48.8
LOS	E	D	A	D	A	E	D	F	E	D
Approach Delay		51.1			35.8		80.4			51.0
Approach LOS		D			D		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 63.8	Intersection LOS: E
Intersection Capacity Utilization 109.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	346	29	484	78	59	34	992	1095	105	890	15
Future Volume (veh/h)	15	346	29	484	78	59	34	992	1095	105	890	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	357	0	499	80	55	35	1023	696	108	918	11
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	418	355	555	401	276	46	1635	796	131	1926	23
Arrive On Green	0.02	0.23	0.00	0.19	0.40	0.40	0.03	0.33	0.33	0.03	0.13	0.13
Sat Flow, veh/h	1619	1800	1530	2956	995	684	1619	4914	1530	1619	5004	60
Grp Volume(v), veh/h	15	357	0	499	0	135	35	1023	696	108	601	328
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1679	1619	1638	1530	1619	1638	1788
Q Serve(g_s), s	1.1	22.8	0.0	19.8	0.0	6.3	2.6	21.1	39.9	8.0	20.5	20.5
Cycle Q Clear(g_c), s	1.1	22.8	0.0	19.8	0.0	6.3	2.6	21.1	39.9	8.0	20.5	20.5
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	27	418	355	555	0	677	46	1635	796	131	1261	688
V/C Ratio(X)	0.57	0.85	0.00	0.90	0.00	0.20	0.75	0.63	0.87	0.83	0.48	0.48
Avail Cap(c_a), veh/h	81	570	484	788	0	896	81	1635	796	135	1261	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.94	0.94	0.94
Uniform Delay (d), s/veh	58.6	44.1	0.0	47.6	0.0	23.2	57.9	33.7	25.3	57.6	41.1	41.2
Incr Delay (d2), s/veh	6.8	10.5	0.0	8.0	0.0	0.2	0.8	0.2	1.4	28.4	1.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.5	0.0	8.7	0.0	2.9	1.2	9.5	20.5	4.6	9.5	10.6
LnGrp Delay(d),s/veh	65.4	54.7	0.0	55.6	0.0	23.4	58.7	33.9	26.7	85.9	42.4	43.4
LnGrp LOS	E	D		E		C	E	C	C	F	D	D
Approach Vol, veh/h		372			634			1754			1037	
Approach Delay, s/veh		55.1			48.7			31.5			47.2	
Approach LOS		E			D			C			D	

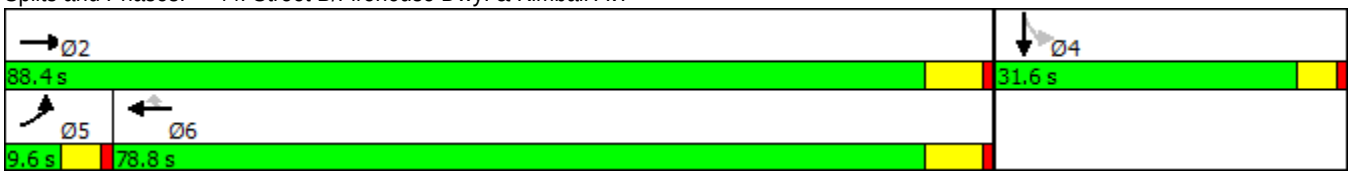
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	45.9	26.5	33.8	7.4	52.2	6.0	54.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	20.0	32.0	38.0	6.0	24.0	6.0	64.0
Max Q Clear Time (g_c+I1), s	10.0	41.9	21.8	24.8	4.6	22.5	3.1	8.3
Green Ext Time (p_c), s	0.0	0.0	0.7	3.0	0.0	1.3	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	41.0
HCM 2010 LOS	D

Lane Group	EBT	WBT	Ø4	Ø5
Lane Configurations				
Traffic Volume (vph)	1187	876		
Future Volume (vph)	1187	876		
Turn Type	NA	NA		
Protected Phases	2	6	4	5
Permitted Phases				
Detector Phase	2	6		
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	23.2	23.2	31.6	9.6
Total Split (s)	88.4	78.8	31.6	9.6
Total Split (%)	73.7%	65.7%	26%	8%
Yellow Time (s)	5.2	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	6.2	6.2		
Lead/Lag		Lag		Lead
Lead-Lag Optimize?		Yes		Yes
Recall Mode	None	None	Min	None
Act Effct Green (s)	26.5	26.5		
Actuated g/C Ratio	0.52	0.52		
v/c Ratio	0.70	0.52		
Control Delay	12.0	9.5		
Queue Delay	0.0	0.0		
Total Delay	12.0	9.5		
LOS	B	A		
Approach Delay	12.0	9.5		
Approach LOS	B	A		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 50.9		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.70		
Intersection Signal Delay: 11.0	Intersection LOS: B	
Intersection Capacity Utilization 39.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1187	0	0	876	0	0	0	0	0	0	0
Future Volume (veh/h)	0	1187	0	0	876	0	0	0	0	0	0	0
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1249	0	0	922	0				0	0	0
Adj No. of Lanes	1	2	0	0	2	1				0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	4	2874	0	0	2874	1286				0	5	0
Arrive On Green	0.00	0.84	0.00	0.00	0.84	0.00				0.00	0.00	0.00
Sat Flow, veh/h	1619	3510	0	0	3510	1530				0	1800	0
Grp Volume(v), veh/h	0	1249	0	0	922	0				0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530				0	1800	0
Q Serve(g_s), s	0.0	3.6	0.0	0.0	2.3	0.0				0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.6	0.0	0.0	2.3	0.0				0.0	0.0	0.0
Prop In Lane	1.00		0.00	0.00		1.00				0.00		0.00
Lane Grp Cap(c), veh/h	4	2874	0	0	2874	1286				0	5	0
V/C Ratio(X)	0.00	0.43	0.00	0.00	0.32	0.00				0.00	0.00	0.00
Avail Cap(c_a), veh/h	208	7234	0	0	6390	2858				0	1251	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.8	0.0	0.0	0.7	0.0				0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0				0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	0.0	0.0	1.0	0.0				0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.9	0.0	0.0	0.7	0.0				0.0	0.0	0.0
LnGrp LOS		A			A							
Approach Vol, veh/h		1249			922						0	
Approach Delay, s/veh		0.9			0.7						0.0	
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		38.9		0.0	0.0	38.9		
Change Period (Y+Rc), s		6.2		4.6	4.6	6.2		
Max Green Setting (Gmax), s		82.2		27.0	5.0	72.6		
Max Q Clear Time (g_c+I1), s		5.6		0.0	0.0	4.3		
Green Ext Time (p_c), s		27.1		0.0	0.0	26.3		

Intersection Summary	
HCM 2010 Ctrl Delay	0.8
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	267	672	14	413	25	6	75	18
Future Volume (vph)	267	672	14	413	25	6	75	18
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	37.4	9.6	24.0	33.0	33.0	33.0	33.0
Total Split (%)	28.8%	46.8%	12.0%	30.0%	41.3%	41.3%	41.3%	41.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	15.9	34.7	5.1	15.9		26.0		26.0
Actuated g/C Ratio	0.22	0.47	0.07	0.22		0.35		0.35
v/c Ratio	0.81	0.48	0.14	0.74		0.10		0.89
Control Delay	48.1	15.4	38.4	35.0		17.9		45.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	48.1	15.4	38.4	35.0		17.9		45.6
LOS	D	B	D	C		B		D
Approach Delay		24.2		35.1		17.9		45.6
Approach LOS		C		D		B		D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 73.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 31.7	Intersection LOS: C
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	672	46	14	413	89	25	6	10	75	18	347
Future Volume (veh/h)	267	672	46	14	413	89	25	6	10	75	18	347
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	284	715	49	15	439	95	27	6	11	80	19	369
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	326	1322	91	29	631	135	241	58	71	129	44	413
Arrive On Green	0.20	0.41	0.41	0.02	0.23	0.23	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1619	3241	222	1619	2802	602	447	168	205	193	126	1189
Grp Volume(v), veh/h	284	377	387	15	267	267	44	0	0	468	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1753	1619	1710	1694	821	0	0	1508	0	0
Q Serve(g_s), s	11.6	11.4	11.4	0.6	9.7	9.9	0.0	0.0	0.0	14.2	0.0	0.0
Cycle Q Clear(g_c), s	11.6	11.4	11.4	0.6	9.7	9.9	1.2	0.0	0.0	19.9	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.36	0.61		0.25	0.17		0.79
Lane Grp Cap(c), veh/h	326	698	715	29	385	381	371	0	0	586	0	0
V/C Ratio(X)	0.87	0.54	0.54	0.51	0.69	0.70	0.12	0.00	0.00	0.80	0.00	0.00
Avail Cap(c_a), veh/h	437	783	803	119	447	443	453	0	0	690	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.4	15.3	15.3	33.1	24.2	24.3	14.9	0.0	0.0	20.9	0.0	0.0
Incr Delay (d2), s/veh	11.2	0.7	0.6	5.0	3.8	4.1	0.1	0.0	0.0	5.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	5.5	5.6	0.3	5.0	5.0	0.6	0.0	0.0	9.2	0.0	0.0
LnGrp Delay(d),s/veh	37.6	16.0	16.0	38.2	28.0	28.4	15.0	0.0	0.0	26.6	0.0	0.0
LnGrp LOS	D	B	B	D	C	C	B			C		
Approach Vol, veh/h		1048			549			44			468	
Approach Delay, s/veh		21.8			28.5			15.0			26.6	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	34.0		28.3	18.3	21.5		28.3
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	31.2		28.4	18.4	17.8		28.4
Max Q Clear Time (g_c+I1), s	2.6	13.4		21.9	13.6	11.9		3.2
Green Ext Time (p_c), s	0.0	6.8		1.7	0.2	3.4		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	24.5
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	345	367	192	156	328	202
Future Volume (vph)	345	367	192	156	328	202
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	14.0	46.8	32.8	32.8
Total Split (%)	41.5%	41.5%	17.5%	58.5%	41.0%	41.0%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	18.8	17.1	9.8	32.2	17.7	17.7
Actuated g/C Ratio	0.30	0.28	0.16	0.52	0.29	0.29
v/c Ratio	0.76	0.57	0.81	0.18	0.69	0.37
Control Delay	31.0	5.9	57.0	9.5	27.8	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	5.9	57.0	9.5	27.8	5.1
LOS	C	A	E	A	C	A
Approach Delay				35.6	19.2	
Approach LOS				D	B	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 61.8
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 22.3 — Intersection LOS: C
Intersection Capacity Utilization 63.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	345	0	367	0	0	0	192	156	0	0	328	202
Future Volume (veh/h)	345	0	367	0	0	0	192	156	0	0	328	202
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	371	0	395				206	168	0	0	353	217
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	486	0	459				248	918	0	0	490	406
Arrive On Green	0.30	0.00	0.30				0.15	0.51	0.00	0.00	0.27	0.27
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1493
Grp Volume(v), veh/h	371	0	395				206	168	0	0	353	217
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1493
Q Serve(g_s), s	11.4	0.0	13.3				6.7	2.8	0.0	0.0	9.7	6.8
Cycle Q Clear(g_c), s	11.4	0.0	13.3				6.7	2.8	0.0	0.0	9.7	6.8
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	486	0	459				248	918	0	0	490	406
V/C Ratio(X)	0.76	0.00	0.86				0.83	0.18	0.00	0.00	0.72	0.53
Avail Cap(c_a), veh/h	847	0	801				279	1351	0	0	889	738
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	0.0	18.0				22.4	7.2	0.0	0.0	18.0	16.9
Incr Delay (d2), s/veh	1.0	0.0	1.9				15.3	0.1	0.0	0.0	2.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	10.4				4.0	1.4	0.0	0.0	5.1	5.8
LnGrp Delay(d),s/veh	18.3	0.0	19.9				37.8	7.3	0.0	0.0	20.0	18.0
LnGrp LOS	B		B				D	A			C	B
Approach Vol, veh/h		766						374			570	
Approach Delay, s/veh		19.2						24.1			19.3	
Approach LOS		B						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		33.7		21.0	13.0	20.7		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		41.0		28.6	9.4	27.0		
Max Q Clear Time (g_c+I1), s		4.8		15.3	8.7	11.7		
Green Ext Time (p_c), s		3.8		1.1	0.0	3.2		

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

APPENDIX 7.12:

OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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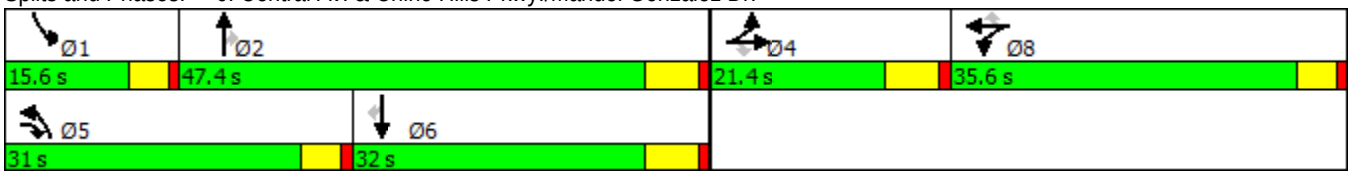
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	313	53	301	2	3	7	384	846	46	66	702	259
Future Volume (vph)	313	53	301	2	3	7	384	846	46	66	702	259
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	5	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	31.0	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	25.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	47.1	13.5	13.5	13.5	26.9	47.6	47.6	8.2	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.50	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.76	0.72	0.35	0.01	0.01	0.02	0.91	0.53	0.06	0.52	0.79	0.50
Control Delay	60.3	55.9	2.5	35.5	35.3	0.1	59.9	21.3	0.2	57.7	40.2	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	55.9	2.5	35.5	35.3	0.1	59.9	21.3	0.2	57.7	40.2	15.1
LOS	E	E	A	D	D	A	E	C	A	E	D	B
Approach Delay		33.0			13.7			32.2			35.0	
Approach LOS		C			B			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 33.2	Intersection LOS: C
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	53	301	2	3	7	384	846	46	66	702	259
Future Volume (veh/h)	313	53	301	2	3	7	384	846	46	66	702	259
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	381	0	231	2	3	3	417	920	38	72	763	227
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	479	0	650	33	36	31	449	1816	796	90	1058	467
Arrive On Green	0.15	0.00	0.15	0.02	0.02	0.02	0.28	0.53	0.53	0.06	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	381	0	231	2	3	3	417	920	38	72	763	227
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	9.6	0.0	8.7	0.1	0.1	0.2	21.2	14.6	1.0	3.7	16.8	10.4
Cycle Q Clear(g_c), s	9.6	0.0	8.7	0.1	0.1	0.2	21.2	14.6	1.0	3.7	16.8	10.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	479	0	650	33	36	31	449	1816	796	90	1058	467
V/C Ratio(X)	0.80	0.00	0.36	0.06	0.08	0.10	0.93	0.51	0.05	0.80	0.72	0.49
Avail Cap(c_a), veh/h	596	0	706	592	659	560	504	1816	796	210	1058	467
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	0.0	16.5	40.7	40.7	40.7	29.8	12.7	9.6	39.6	26.0	23.8
Incr Delay (d2), s/veh	6.0	0.0	0.3	0.8	1.0	1.3	21.4	1.0	0.1	6.1	4.3	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	3.7	0.1	0.1	0.1	12.2	7.2	0.4	1.8	8.6	4.8
LnGrp Delay(d),s/veh	40.8	0.0	16.8	41.5	41.7	42.1	51.3	13.8	9.7	45.7	30.3	27.4
LnGrp LOS	D		B	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		612			8			1375			1062	
Approach Delay, s/veh		31.8			41.8			25.0			30.7	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	50.8		18.3	28.1	32.0		6.3
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.7	16.6		11.6	23.2	18.8		2.2
Green Ext Time (p_c), s	0.0	17.6		0.9	0.2	6.3		0.0

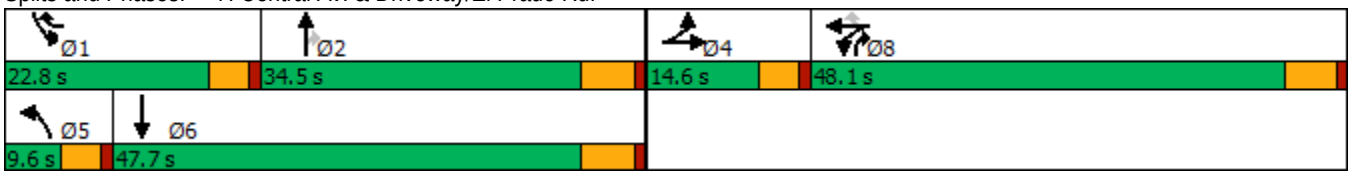
Intersection Summary	
HCM 2010 Ctrl Delay	28.4
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1058	3	519	2	783	747	446	639
Future Volume (vph)	1	1	1058	3	519	2	783	747	446	639
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	48.1	48.1	22.8	9.6	34.5	48.1	22.8	47.7
Total Split (%)	12.2%	12.2%	40.1%	40.1%	19.0%	8.0%	28.8%	40.1%	19.0%	39.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	42.4	42.4	66.5	5.0	28.8	71.2	18.2	49.9
Actuated g/C Ratio	0.09	0.09	0.39	0.39	0.61	0.05	0.27	0.66	0.17	0.46
v/c Ratio	0.01	0.01	0.98	0.93	0.55	0.03	0.96	0.72	0.94	0.32
Control Delay	48.0	41.0	66.1	54.4	8.4	53.0	61.2	7.5	72.4	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	66.1	54.4	8.4	53.0	61.2	7.5	72.4	20.2
LOS	D	D	E	D	A	D	E	A	E	C
Approach Delay		43.3		43.2			35.0			41.5
Approach LOS		D		D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 39.8	Intersection LOS: D
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1058	3	519	2	783	747	446	639	10
Future Volume (veh/h)	1	1	1	1058	3	519	2	783	747	446	639	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1178	0	434	2	870	661	496	710	9
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1229	0	833	4	888	973	517	2108	27
Arrive On Green	0.01	0.01	0.01	0.38	0.00	0.38	0.00	0.26	0.26	0.16	0.42	0.42
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	3141	5001	63
Grp Volume(v), veh/h	1	0	2	1178	0	434	2	870	661	496	465	254
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1570	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	39.2	0.0	19.9	0.1	27.9	28.7	17.3	10.6	10.6
Cycle Q Clear(g_c), s	0.1	0.0	0.1	39.2	0.0	19.9	0.1	27.9	28.7	17.3	10.6	10.6
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	13	0	13	1229	0	833	4	888	973	517	1381	754
V/C Ratio(X)	0.08	0.00	0.15	0.96	0.00	0.52	0.46	0.98	0.68	0.96	0.34	0.34
Avail Cap(c_a), veh/h	146	0	150	1239	0	837	73	888	973	517	1381	754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	0.0	54.5	33.4	0.0	16.0	55.0	40.6	12.4	45.8	21.6	21.6
Incr Delay (d2), s/veh	0.9	0.0	2.0	16.5	0.0	0.6	25.4	25.7	3.8	29.2	0.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	20.3	0.0	8.5	0.1	16.3	21.0	9.6	4.9	5.5
LnGrp Delay(d),s/veh	55.4	0.0	56.4	49.9	0.0	16.6	80.4	66.3	16.2	75.0	22.2	22.8
LnGrp LOS	E		E	D		B	F	E	B	E	C	C
Approach Vol, veh/h		3			1612			1533			1215	
Approach Delay, s/veh		56.1			41.0			44.7			43.9	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.8	34.5		5.5	4.9	52.4		47.8
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	18.2	28.7		10.0	5.0	41.9		42.3
Max Q Clear Time (g_c+I1), s	19.3	30.7		2.1	2.1	12.6		41.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	6.5		0.8

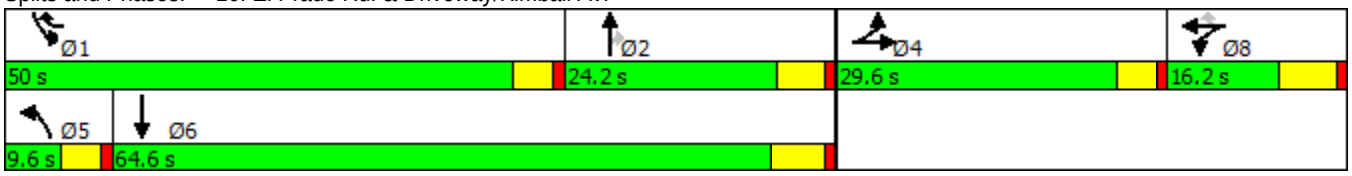
Intersection Summary	
HCM 2010 Ctrl Delay	43.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	1	27	1294	5	288	32	841	209
Future Volume (vph)	12	1	27	1294	5	288	32	841	209
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	50.0	9.6	24.2	24.2	50.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	41.7%	8.0%	20.2%	20.2%	41.7%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	59.0	5.1	19.5	19.5	46.6	60.4
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.63
v/c Ratio	0.06	0.01	0.31	1.12	0.06	0.81	0.08	0.56	0.23
Control Delay	40.2	30.3	50.1	78.1	52.6	57.6	0.3	22.6	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.3	50.1	78.1	52.6	57.6	0.3	22.6	11.3
LOS	D	C	D	E	D	E	A	C	B
Approach Delay		38.2	76.9			51.8			20.0
Approach LOS		D	E			D			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 51.4	Intersection LOS: D
Intersection Capacity Utilization 120.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	2	29	27	1294	5	288	32	841	209	44
Future Volume (veh/h)	12	1	2	29	27	1294	5	288	32	841	209	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	1	1	30	28	459	5	294	33	858	213	45
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	55	28	28	130	121	696	116	373	317	978	644	136
Arrive On Green	0.03	0.03	0.03	0.14	0.14	0.14	0.07	0.21	0.21	0.31	0.45	0.45
Sat Flow, veh/h	1619	827	827	908	847	1530	1619	1800	1530	3141	1441	305
Grp Volume(v), veh/h	12	0	2	58	0	459	5	294	33	858	0	258
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1570	0	1746
Q Serve(g_s), s	0.5	0.0	0.1	2.0	0.0	10.0	0.2	10.8	1.2	18.1	0.0	6.7
Cycle Q Clear(g_c), s	0.5	0.0	0.1	2.0	0.0	10.0	0.2	10.8	1.2	18.1	0.0	6.7
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	55	0	56	252	0	696	116	373	317	978	0	780
V/C Ratio(X)	0.22	0.00	0.04	0.23	0.00	0.66	0.04	0.79	0.10	0.88	0.00	0.33
Avail Cap(c_a), veh/h	580	0	593	252	0	696	116	490	417	2045	0	1472
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	32.6	26.5	0.0	14.8	30.1	26.2	22.4	22.8	0.0	12.5
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.5	0.0	2.3	0.1	6.3	0.1	1.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.0	0.0	7.2	0.1	6.0	0.5	7.9	0.0	3.3
LnGrp Delay(d),s/veh	34.7	0.0	32.8	26.9	0.0	17.1	30.2	32.4	22.5	23.8	0.0	12.8
LnGrp LOS	C		C	C		B	C	C	C	C		B
Approach Vol, veh/h		14			517			332			1116	
Approach Delay, s/veh		34.5			18.2			31.4			21.2	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.3	20.3		7.0	9.6	37.0		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	45.4	* 19		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	20.1	12.8		2.5	2.2	8.7		12.0
Green Ext Time (p_c), s	1.7	1.7		0.0	0.0	3.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

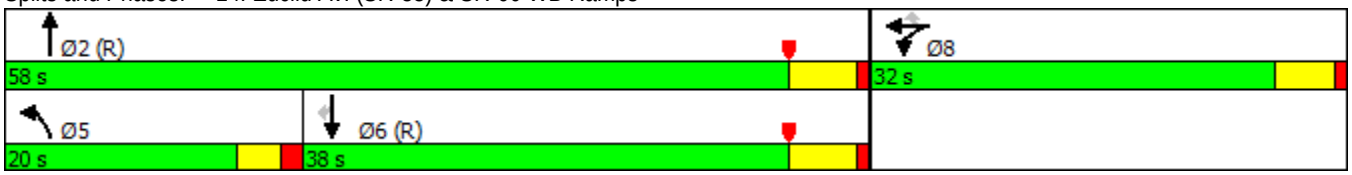
Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	795	2	386	467	984	1062	489
Future Volume (vph)	795	2	386	467	984	1062	489
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	32.0	32.0	32.0	20.0	58.0	38.0	38.0
Total Split (%)	35.6%	35.6%	35.6%	22.2%	64.4%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	27.0	27.0	27.0	15.5	52.5	32.5	32.5
Actuated g/C Ratio	0.30	0.30	0.30	0.17	0.58	0.36	0.36
v/c Ratio	0.98	0.95	0.74	0.93	0.53	0.92	0.60
Control Delay	71.8	63.9	31.5	51.6	17.9	41.5	5.3
Queue Delay	4.1	2.7	0.0	0.0	1.3	0.0	0.0
Total Delay	75.8	66.6	31.5	51.6	19.1	41.5	5.3
LOS	E	E	C	D	B	D	A
Approach Delay		59.6			29.6	30.1	
Approach LOS		E			C	C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 38.3 — Intersection LOS: D
Intersection Capacity Utilization 137.0% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	795	2	386	467	984	0	0	1062	489
Future Volume (veh/h)	0	0	0	795	2	386	467	984	0	0	1062	489
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				937	0	174	502	1058	0	0	1142	526
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				971	0	459	541	1995	0	0	1235	540
Arrive On Green				0.30	0.00	0.30	0.06	0.19	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3238	0	1530	3141	3510	0	0	3510	1496
Grp Volume(v), veh/h				937	0	174	502	1058	0	0	1142	526
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1570	1710	0	0	1710	1496
Q Serve(g_s), s				25.7	0.0	8.1	14.3	25.0	0.0	0.0	28.8	31.2
Cycle Q Clear(g_c), s				25.7	0.0	8.1	14.3	25.0	0.0	0.0	28.8	31.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				971	0	459	541	1995	0	0	1235	540
V/C Ratio(X)				0.96	0.00	0.38	0.93	0.53	0.00	0.00	0.92	0.97
Avail Cap(c_a), veh/h				971	0	459	541	1995	0	0	1235	540
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.54	0.54	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.0	0.0	24.9	41.9	25.2	0.0	0.0	27.6	28.3
Incr Delay (d2), s/veh				20.6	0.0	0.2	14.0	0.5	0.0	0.0	12.9	32.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.2	0.0	3.4	7.3	12.0	0.0	0.0	15.7	17.8
LnGrp Delay(d),s/veh				51.6	0.0	25.1	55.9	25.8	0.0	0.0	40.5	61.1
LnGrp LOS				D		C	E	C			D	E
Approach Vol, veh/h					1111			1560			1668	
Approach Delay, s/veh					47.5			35.5			47.0	
Approach LOS					D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			20.0	38.0		32.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		52.5			15.5	32.5		27.0
Max Q Clear Time (g_c+I1), s		27.0			16.3	33.2		27.7
Green Ext Time (p_c), s		22.6			0.0	0.0		0.0

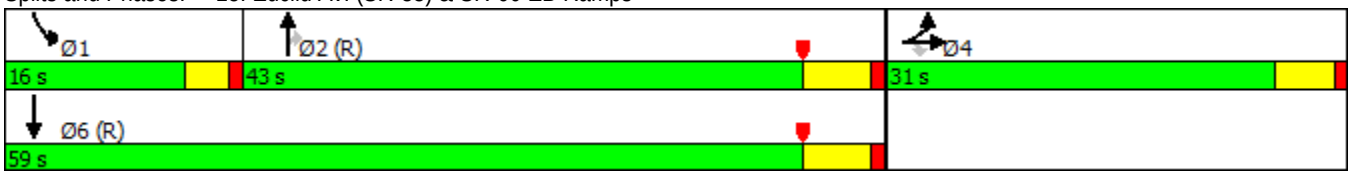
Intersection Summary	
HCM 2010 Ctrl Delay	43.0
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	344	0	656	1106	659	305	1552
Future Volume (vph)	344	0	656	1106	659	305	1552
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	31.0	31.0	31.0	43.0	43.0	16.0	59.0
Total Split (%)	34.4%	34.4%	34.4%	47.8%	47.8%	17.8%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	23.1	23.1	23.1	40.8	40.8	11.6	56.4
Actuated g/C Ratio	0.26	0.26	0.26	0.45	0.45	0.13	0.63
v/c Ratio	0.84	0.89	0.84	0.76	0.66	0.80	0.77
Control Delay	50.6	48.8	42.7	25.5	4.9	45.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Total Delay	50.6	48.8	42.7	25.5	4.9	45.2	6.4
LOS	D	D	D	C	A	D	A
Approach Delay		47.3		17.8			12.8
Approach LOS		D		B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 137.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	0	656	0	0	0	0	1106	659	305	1552	0
Future Volume (veh/h)	344	0	656	0	0	0	0	1106	659	305	1552	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	244	0	746				0	1177	701	324	1651	0
Adj No. of Lanes	1	0	2				0	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	433	0	818				0	1526	681	393	2107	0
Arrive On Green	0.27	0.00	0.27				0.00	0.45	0.45	0.04	0.20	0.00
Sat Flow, veh/h	1619	0	3060				0	3510	1526	3141	3510	0
Grp Volume(v), veh/h	244	0	746				0	1177	701	324	1651	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1526	1570	1710	0
Q Serve(g_s), s	11.7	0.0	21.3				0.0	26.1	40.2	9.2	41.2	0.0
Cycle Q Clear(g_c), s	11.7	0.0	21.3				0.0	26.1	40.2	9.2	41.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	433	0	818				0	1526	681	393	2107	0
V/C Ratio(X)	0.56	0.00	0.91				0.00	0.77	1.03	0.82	0.78	0.00
Avail Cap(c_a), veh/h	468	0	884				0	1526	681	419	2107	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.70	0.70	0.23	0.23	0.00
Uniform Delay (d), s/veh	28.4	0.0	31.9				0.0	21.0	24.9	42.2	30.2	0.0
Incr Delay (d2), s/veh	0.6	0.0	12.4				0.0	2.7	36.6	2.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	10.3				0.0	12.8	23.8	4.2	19.7	0.0
LnGrp Delay(d),s/veh	29.1	0.0	44.3				0.0	23.7	61.5	44.9	30.9	0.0
LnGrp LOS	C		D					C	F	D	C	
Approach Vol, veh/h		990						1878			1975	
Approach Delay, s/veh		40.6						37.9			33.2	
Approach LOS		D						D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.3	45.7		29.1		60.9		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	12.0	37.5		26.0		53.5		
Max Q Clear Time (g_c+I1), s	11.2	42.2		23.3		43.2		
Green Ext Time (p_c), s	0.1	0.0		0.8		10.2		

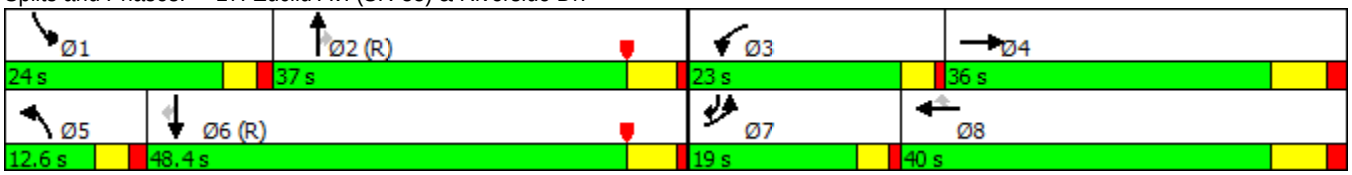
Intersection Summary	
HCM 2010 Ctrl Delay	36.5
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	148	337	184	396	52	66	1004	176	186	1172	153
Future Volume (vph)	148	337	184	396	52	66	1004	176	186	1172	153
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	19.0	36.0	23.0	40.0	40.0	12.6	37.0	37.0	24.0	48.4	19.0
Total Split (%)	15.8%	30.0%	19.2%	33.3%	33.3%	10.5%	30.8%	30.8%	20.0%	40.3%	15.8%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.9	21.4	17.1	24.7	24.7	9.4	41.8	41.8	18.7	53.3	72.7
Actuated g/C Ratio	0.12	0.18	0.14	0.21	0.21	0.08	0.35	0.35	0.16	0.44	0.61
v/c Ratio	0.84	0.68	0.84	0.59	0.13	0.55	0.62	0.28	0.78	0.57	0.16
Control Delay	86.4	49.8	79.9	46.0	0.6	60.6	31.1	11.2	47.7	18.8	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	49.8	79.9	46.0	0.6	60.6	31.1	11.2	47.7	18.8	6.7
LOS	F	D	E	D	A	E	C	B	D	B	A
Approach Delay		59.8		52.1			29.9			21.1	
Approach LOS		E		D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 68 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 34.2	Intersection LOS: C
Intersection Capacity Utilization 73.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	337	57	184	396	52	66	1004	176	186	1172	153
Future Volume (veh/h)	148	337	57	184	396	52	66	1004	176	186	1172	153
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	156	355	37	194	417	50	69	1057	104	196	1234	95
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	180	537	56	218	669	299	86	1869	582	223	2285	882
Arrive On Green	0.11	0.17	0.17	0.13	0.20	0.20	0.02	0.13	0.13	0.05	0.15	0.15
Sat Flow, veh/h	1619	3124	323	1619	3420	1528	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	156	193	199	194	417	50	69	1057	104	196	1234	95
Grp Sat Flow(s),veh/h/ln	1619	1710	1737	1619	1710	1528	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	11.4	12.7	12.8	14.1	13.4	3.3	5.1	24.3	7.3	14.4	27.8	5.1
Cycle Q Clear(g_c), s	11.4	12.7	12.8	14.1	13.4	3.3	5.1	24.3	7.3	14.4	27.8	5.1
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	294	298	218	669	299	86	1869	582	223	2285	882
V/C Ratio(X)	0.87	0.66	0.67	0.89	0.62	0.17	0.80	0.57	0.18	0.88	0.54	0.11
Avail Cap(c_a), veh/h	202	413	420	256	941	420	109	1869	582	263	2285	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.66	0.66	0.66	0.50	0.50	0.50
Uniform Delay (d), s/veh	52.5	46.4	46.5	51.0	44.2	40.1	58.3	43.1	35.7	56.3	38.9	18.8
Incr Delay (d2), s/veh	26.3	3.5	3.6	24.4	1.4	0.4	19.2	0.8	0.4	13.9	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	6.2	6.5	7.8	6.4	1.4	2.7	11.2	3.2	7.3	12.7	2.2
LnGrp Delay(d),s/veh	78.7	49.9	50.1	75.5	45.6	40.5	77.5	44.0	36.1	70.1	39.4	18.9
LnGrp LOS	E	D	D	E	D	D	E	D	D	E	D	B
Approach Vol, veh/h		548			661			1230			1525	
Approach Delay, s/veh		58.2			54.0			45.2			42.1	
Approach LOS		E			D			D			D	

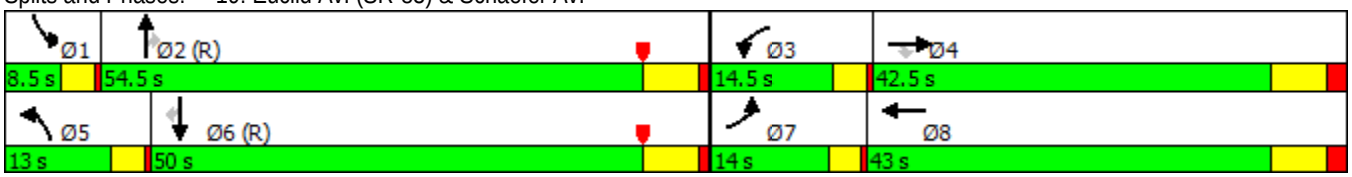
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.1	51.1	20.2	27.6	10.9	61.3	17.3	30.5
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	19.5	31.5	19.0	29.0	8.1	42.9	15.0	33.0
Max Q Clear Time (g_c+I1), s	16.4	26.3	16.1	14.8	7.1	29.8	13.4	15.4
Green Ext Time (p_c), s	0.1	4.6	0.1	5.6	0.0	10.5	0.0	6.2

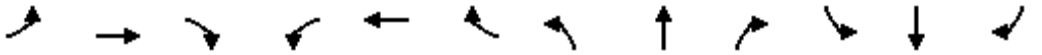
Intersection Summary	
HCM 2010 Ctrl Delay	47.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	142	62	121	60	121	121	1455	22	15	1731	134
Future Volume (vph)	142	62	121	60	121	121	1455	22	15	1731	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	42.5	42.5	14.5	43.0	13.0	54.5	54.5	8.5	50.0	50.0
Total Split (%)	11.7%	35.4%	35.4%	12.1%	35.8%	10.8%	45.4%	45.4%	7.1%	41.7%	41.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.5	20.6	20.6	10.4	17.7	14.9	71.6	71.6	5.4	56.9	56.9
Actuated g/C Ratio	0.09	0.17	0.17	0.09	0.15	0.12	0.60	0.60	0.04	0.47	0.47
v/c Ratio	1.07	0.21	0.35	0.46	0.56	0.65	0.53	0.02	0.22	0.79	0.18
Control Delay	147.7	43.1	8.8	63.3	51.5	41.9	21.2	2.5	82.5	10.6	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	147.7	43.1	8.8	63.3	51.5	41.9	21.2	2.5	82.5	10.6	0.6
LOS	F	D	A	E	D	D	C	A	F	B	A
Approach Delay		76.0			55.1		22.5			10.4	
Approach LOS		E			E		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 22.8	Intersection LOS: C
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	62	121	60	121	18	121	1455	22	15	1731	134
Future Volume (veh/h)	142	62	121	60	121	18	121	1455	22	15	1731	134
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	151	66	77	64	129	17	129	1548	18	16	1841	95
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	142	215	183	119	165	22	128	3061	953	28	2757	838
Arrive On Green	0.09	0.12	0.12	0.07	0.11	0.11	0.03	0.21	0.21	0.01	0.38	0.38
Sat Flow, veh/h	1619	1800	1530	1619	1558	205	1619	4914	1530	1619	4914	1494
Grp Volume(v), veh/h	151	66	77	64	0	146	129	1548	18	16	1841	95
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1638	1530	1619	1638	1494
Q Serve(g_s), s	10.5	4.0	5.6	4.6	0.0	9.7	9.5	33.5	1.1	1.2	37.5	5.0
Cycle Q Clear(g_c), s	10.5	4.0	5.6	4.6	0.0	9.7	9.5	33.5	1.1	1.2	37.5	5.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	142	215	183	119	0	186	128	3061	953	28	2757	838
V/C Ratio(X)	1.07	0.31	0.42	0.54	0.00	0.78	1.01	0.51	0.02	0.57	0.67	0.11
Avail Cap(c_a), veh/h	142	533	453	148	0	529	128	3061	953	67	2757	838
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.65	0.65	0.65	0.26	0.26	0.26
Uniform Delay (d), s/veh	54.8	48.3	49.0	53.6	0.0	52.3	58.4	31.3	18.4	58.9	28.1	18.0
Incr Delay (d2), s/veh	94.3	0.6	1.1	1.4	0.0	5.3	65.8	0.4	0.0	1.8	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	2.0	2.4	2.1	0.0	5.0	6.6	15.3	0.5	0.5	17.0	2.1
LnGrp Delay(d),s/veh	149.1	48.9	50.1	55.0	0.0	57.7	124.2	31.7	18.4	60.7	28.5	18.1
LnGrp LOS	F	D	D	E		E	F	C	B	E	C	B
Approach Vol, veh/h		294			210			1695			1952	
Approach Delay, s/veh		100.6			56.9			38.6			28.2	
Approach LOS		F			E			D			C	

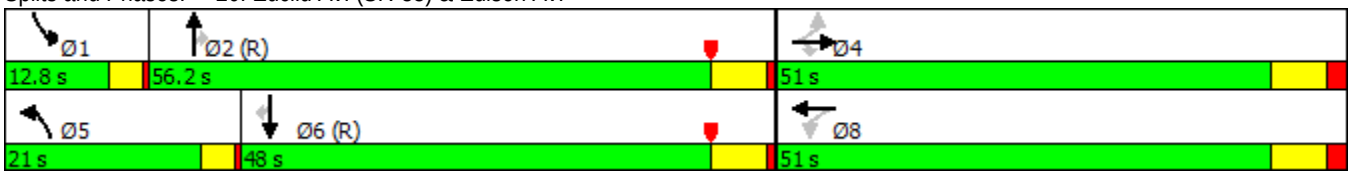
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	80.8	12.3	21.4	13.0	73.3	14.0	19.7
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	48.5	11.0	35.5	9.5	44.0	10.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	35.5	6.6	7.6	11.5	39.5	12.5	11.7
Green Ext Time (p_c), s	0.0	12.2	0.0	1.0	0.0	4.4	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.0
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	218	169	240	71	349	252	1304	38	41	1577	252
Future Volume (vph)	218	169	240	71	349	252	1304	38	41	1577	252
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	21.0	56.2	56.2	12.8	48.0	48.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	17.5%	46.8%	46.8%	10.7%	40.0%	40.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.0	44.0	44.0	44.0	44.0	17.5	53.7	53.7	7.5	42.0	42.0
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.15	0.45	0.45	0.06	0.35	0.35
v/c Ratio	1.12	0.27	0.35	0.20	0.64	1.14	0.63	0.06	0.44	0.98	0.42
Control Delay	133.7	28.2	4.6	27.7	36.3	137.8	20.3	1.2	80.3	38.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.7	28.2	4.6	27.7	36.3	137.8	20.3	1.2	80.3	38.2	9.3
LOS	F	C	A	C	D	F	C	A	F	D	A
Approach Delay		55.8			35.0		38.4			35.2	
Approach LOS		E			C		D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 39.2	Intersection LOS: D
Intersection Capacity Utilization 103.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	169	240	71	349	40	252	1304	38	41	1577	252
Future Volume (veh/h)	218	169	240	71	349	40	252	1304	38	41	1577	252
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	232	180	188	76	371	41	268	1387	25	44	1678	237
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	660	561	348	584	65	236	2271	707	54	1720	535
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.29	0.92	0.92	0.04	0.47	0.47
Sat Flow, veh/h	934	1800	1530	973	1593	176	1619	4914	1530	1619	4914	1528
Grp Volume(v), veh/h	232	180	188	76	0	412	268	1387	25	44	1678	237
Grp Sat Flow(s),veh/h/ln	934	1800	1530	973	0	1769	1619	1638	1530	1619	1638	1528
Q Serve(g_s), s	20.9	8.4	10.6	7.2	0.0	23.1	17.5	5.9	0.2	3.2	40.1	12.5
Cycle Q Clear(g_c), s	44.0	8.4	10.6	15.6	0.0	23.1	17.5	5.9	0.2	3.2	40.1	12.5
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	660	561	348	0	649	236	2271	707	54	1720	535
V/C Ratio(X)	1.04	0.27	0.34	0.22	0.00	0.64	1.14	0.61	0.04	0.81	0.98	0.44
Avail Cap(c_a), veh/h	223	660	561	348	0	649	236	2271	707	125	1720	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.74	0.74	0.74	0.58	0.58	0.58
Uniform Delay (d), s/veh	52.4	26.7	27.4	32.2	0.0	31.4	42.5	2.7	2.4	56.9	31.6	24.2
Incr Delay (d2), s/veh	71.4	0.2	0.3	0.3	0.0	2.0	92.0	0.9	0.1	6.0	11.7	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.8	4.2	4.5	2.0	0.0	11.6	13.8	2.5	0.1	1.5	19.9	5.5
LnGrp Delay(d),s/veh	123.8	27.0	27.8	32.5	0.0	33.4	134.5	3.6	2.5	63.0	43.3	25.7
LnGrp LOS	F	C	C	C		C	F	A	A	E	D	C
Approach Vol, veh/h		600			488			1680			1959	
Approach Delay, s/veh		64.7			33.3			24.4			41.6	
Approach LOS		E			C			C			D	

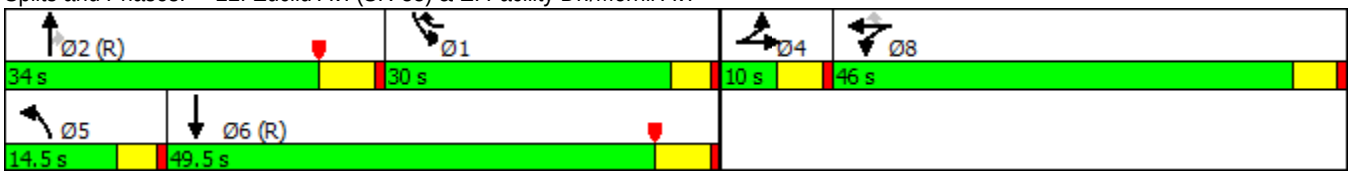
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	61.5		51.0	21.0	48.0		51.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.3	50.2		44.0	17.5	42.0		44.0
Max Q Clear Time (g_c+I1), s	5.2	7.9		46.0	19.5	42.1		25.1
Green Ext Time (p_c), s	0.0	33.3		0.0	0.0	0.0		5.5

Intersection Summary		
HCM 2010 Ctrl Delay		37.6
HCM 2010 LOS		D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	6	48	614	20	1079	183	480	1585
Future Volume (vph)	6	48	614	20	1079	183	480	1585
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	30.0	14.5	34.0	34.0	30.0	49.5
Total Split (%)	8.3%	38.3%	25.0%	12.1%	28.3%	28.3%	25.0%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	35.2	60.8	10.0	40.2	40.2	25.1	64.0
Actuated g/C Ratio	0.04	0.29	0.51	0.08	0.34	0.34	0.21	0.53
v/c Ratio	0.24	0.90	0.76	0.16	0.68	0.32	0.76	0.65
Control Delay	54.8	61.5	19.6	41.0	32.0	11.3	61.8	37.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	61.5	19.6	41.0	32.0	11.3	61.8	37.1
LOS	D	E	B	D	C	B	E	D
Approach Delay	54.8	37.0			29.2			42.7
Approach LOS	D	D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 37.5	Intersection LOS: D
Intersection Capacity Utilization 86.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	387	48	614	20	1079	183	480	1585	44
Future Volume (veh/h)	8	6	4	387	48	614	20	1079	183	480	1585	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	403	50	594	21	1124	165	500	1651	43
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	14	11	5	442	55	859	68	1147	357	870	2368	62
Arrive On Green	0.02	0.02	0.02	0.29	0.29	0.29	0.04	0.23	0.23	0.28	0.48	0.48
Sat Flow, veh/h	803	602	301	1533	190	1509	1619	4914	1530	3141	4925	128
Grp Volume(v), veh/h	17	0	0	453	0	594	21	1124	165	500	1098	596
Grp Sat Flow(s),veh/h/ln	1707	0	0	1723	0	1509	1619	1638	1530	1570	1638	1777
Q Serve(g_s), s	1.2	0.0	0.0	30.5	0.0	0.0	1.5	27.3	11.1	16.4	31.4	31.4
Cycle Q Clear(g_c), s	1.2	0.0	0.0	30.5	0.0	0.0	1.5	27.3	11.1	16.4	31.4	31.4
Prop In Lane	0.47		0.18	0.89		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	31	0	0	497	0	859	68	1147	357	870	1575	855
V/C Ratio(X)	0.55	0.00	0.00	0.91	0.00	0.69	0.31	0.98	0.46	0.57	0.70	0.70
Avail Cap(c_a), veh/h	71	0	0	589	0	939	135	1147	357	870	1575	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.80	0.80	0.80	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	41.2	0.0	18.5	55.8	45.7	39.5	37.3	24.3	24.3
Incr Delay (d2), s/veh	5.6	0.0	0.0	15.5	0.0	1.5	0.8	19.5	3.4	0.6	2.6	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	16.6	0.0	14.2	0.7	14.4	5.1	7.2	14.7	16.5
LnGrp Delay(d),s/veh	64.1	0.0	0.0	56.7	0.0	20.0	56.6	65.2	42.9	37.9	26.9	29.0
LnGrp LOS	E			E		C	E	E	D	D	C	C
Approach Vol, veh/h		17			1047			1310			2194	
Approach Delay, s/veh		64.1			35.9			62.3			30.0	
Approach LOS		E			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	39.2	34.0		7.2	9.5	63.7		39.6
Change Period (Y+Rc), s	6.0	* 6		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	25.5	* 28		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	18.4	29.3		3.2	3.5	33.4		32.5
Green Ext Time (p_c), s	1.6	0.0		0.0	0.0	7.1		2.0

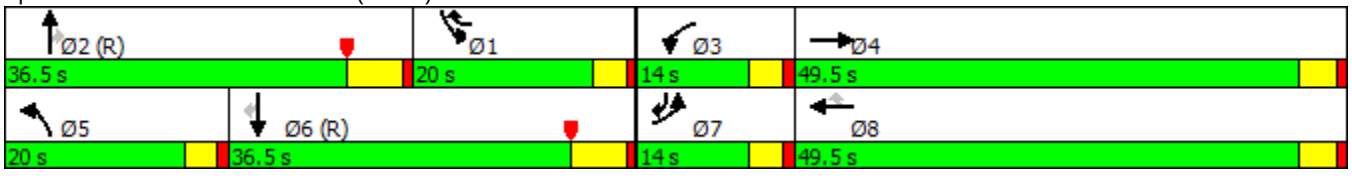
Intersection Summary	
HCM 2010 Ctrl Delay	40.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	278	421	134	606	161	174	785	213	493	734	624
Future Volume (vph)	278	421	134	606	161	174	785	213	493	734	624
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	1	5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	9.0	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	14.0	49.5	14.0	49.5	20.0	20.0	36.5	36.5	20.0	36.5	14.0
Total Split (%)	11.7%	41.3%	11.7%	41.3%	16.7%	16.7%	30.4%	30.4%	16.7%	30.4%	11.7%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	10.0	29.1	10.0	29.1	53.2	16.8	38.8	38.8	23.6	45.6	57.6
Actuated g/C Ratio	0.08	0.24	0.08	0.24	0.44	0.14	0.32	0.32	0.20	0.38	0.48
v/c Ratio	1.09	0.58	1.02	0.75	0.22	0.79	0.50	0.34	0.82	0.40	0.80
Control Delay	132.2	41.0	138.1	47.2	5.4	73.6	34.8	5.9	56.7	30.6	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	132.2	41.0	138.1	47.2	5.4	73.6	34.8	5.9	56.7	30.6	24.8
LOS	F	D	F	D	A	E	C	A	E	C	C
Approach Delay		75.0		53.3			35.4			35.6	
Approach LOS		E		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 49 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 45.2	Intersection LOS: D
Intersection Capacity Utilization 79.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	421	46	134	606	161	174	785	213	493	734	624
Future Volume (veh/h)	278	421	46	134	606	161	174	785	213	493	734	624
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	284	430	45	137	618	142	178	801	209	503	749	599
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	262	722	75	135	790	829	202	1002	312	977	2000	742
Arrive On Green	0.08	0.23	0.23	0.08	0.23	0.23	0.12	0.20	0.20	0.31	0.41	0.41
Sat Flow, veh/h	3141	3127	326	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	284	234	241	137	618	142	178	801	209	503	749	599
Grp Sat Flow(s),veh/h/ln	1570	1710	1743	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	10.0	14.7	14.8	10.0	20.4	1.4	13.0	18.6	11.9	15.8	12.8	40.2
Cycle Q Clear(g_c), s	10.0	14.7	14.8	10.0	20.4	1.4	13.0	18.6	11.9	15.8	12.8	40.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	395	402	135	790	829	202	1002	312	977	2000	742
V/C Ratio(X)	1.09	0.59	0.60	1.02	0.78	0.17	0.88	0.80	0.67	0.51	0.37	0.81
Avail Cap(c_a), veh/h	262	641	653	135	1283	1050	216	1249	389	977	2000	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	0.51	0.51	0.51	0.71	0.71	0.71
Uniform Delay (d), s/veh	55.0	41.1	41.2	55.0	43.3	5.2	51.7	45.4	27.5	33.9	24.9	25.8
Incr Delay (d2), s/veh	76.8	1.3	1.3	81.6	0.7	0.0	17.4	3.5	5.8	0.2	0.4	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	7.0	7.2	7.5	9.7	1.3	6.8	8.8	5.5	6.9	5.8	18.1
LnGrp Delay(d),s/veh	131.8	42.4	42.4	136.7	44.0	5.2	69.0	48.9	33.3	34.1	25.3	32.5
LnGrp LOS	F	D	D	F	D	A	E	D	C	C	C	C
Approach Vol, veh/h		759			897			1188			1851	
Approach Delay, s/veh		75.9			52.0			49.2			30.0	
Approach LOS		E			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	43.3	30.5	14.0	32.2	19.0	54.8	14.0	32.2
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.0	* 31	10.0	45.0	16.0	30.5	10.0	45.0
Max Q Clear Time (g_c+I1), s	17.8	20.6	12.0	16.8	15.0	42.2	12.0	22.4
Green Ext Time (p_c), s	0.0	3.9	0.0	5.6	0.0	0.0	0.0	5.4

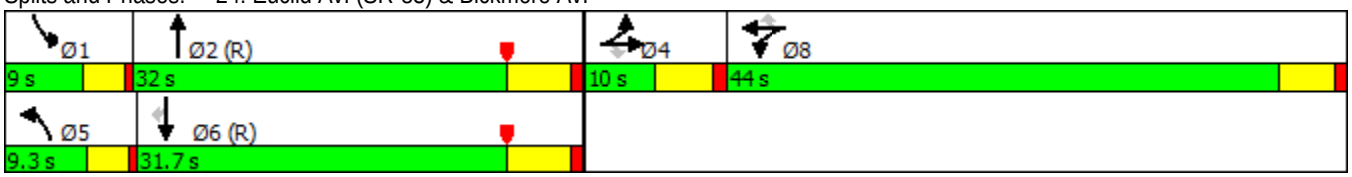
Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	86	28	52	292	411	259	79	799	79	690	112
Future Volume (vph)	86	28	52	292	411	259	79	799	79	690	112
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	9.3	32.0	9.0	31.7	31.7
Total Split (%)	10.5%	10.5%	10.5%	46.3%	46.3%	46.3%	9.8%	33.7%	9.5%	33.4%	33.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	5.0	5.0	5.0	31.5	31.5	31.5	8.2	31.2	8.3	31.3	31.3
Actuated g/C Ratio	0.05	0.05	0.05	0.33	0.33	0.33	0.09	0.33	0.09	0.33	0.33
v/c Ratio	1.07	0.32	0.28	0.55	0.83	0.43	0.60	0.87	0.60	0.65	0.20
Control Delay	163.8	52.6	3.5	29.2	41.7	9.2	62.4	41.3	61.9	31.9	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	163.8	52.6	3.5	29.2	41.7	9.2	62.4	41.3	61.9	31.9	5.9
LOS	F	D	A	C	D	A	E	D	E	C	A
Approach Delay		94.8			29.5			43.0		31.3	
Approach LOS		F			C			D		C	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 38.1	Intersection LOS: D
Intersection Capacity Utilization 76.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	28	52	292	411	259	79	799	111	79	690	112
Future Volume (veh/h)	86	28	52	292	411	259	79	799	111	79	690	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	91	30	53	311	437	263	84	850	117	84	734	110
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	85	95	80	448	498	424	99	1247	172	94	1401	627
Arrive On Green	0.05	0.05	0.05	0.28	0.28	0.28	0.06	0.41	0.41	0.06	0.41	0.41
Sat Flow, veh/h	1619	1800	1521	1619	1800	1530	1619	3021	416	1619	3420	1530
Grp Volume(v), veh/h	91	30	53	311	437	263	84	481	486	84	734	110
Grp Sat Flow(s),veh/h/ln	1619	1800	1521	1619	1800	1530	1619	1710	1727	1619	1710	1530
Q Serve(g_s), s	5.0	1.5	3.2	16.3	22.0	14.3	4.9	21.8	21.8	4.9	15.3	4.3
Cycle Q Clear(g_c), s	5.0	1.5	3.2	16.3	22.0	14.3	4.9	21.8	21.8	4.9	15.3	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	85	95	80	448	498	424	99	706	713	94	1401	627
V/C Ratio(X)	1.07	0.32	0.66	0.69	0.88	0.62	0.85	0.68	0.68	0.90	0.52	0.18
Avail Cap(c_a), veh/h	85	95	80	665	739	628	99	706	713	94	1401	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.85	0.85	0.85
Uniform Delay (d), s/veh	45.0	43.4	44.2	30.7	32.8	30.0	44.2	22.8	22.8	44.5	21.1	17.8
Incr Delay (d2), s/veh	117.2	0.7	15.1	0.7	5.8	0.6	6.2	0.5	0.5	53.3	1.2	0.5
Initial Q Delay(d3),s/veh	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.8	1.7	7.3	11.7	6.1	2.4	10.4	10.5	3.6	7.5	1.9
LnGrp Delay(d),s/veh	163.1	44.1	59.3	31.5	38.6	30.6	50.3	23.3	23.3	97.8	22.3	18.4
LnGrp LOS	F	D	E	C	D	C	D	C	C	F	C	B
Approach Vol, veh/h		174			1011			1051			928	
Approach Delay, s/veh		111.0			34.3			25.4			28.7	
Approach LOS		F			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.0	44.7		10.0	9.3	44.4		31.3
Change Period (Y+Rc), s	3.5	5.5		5.0	3.5	5.5		5.0
Max Green Setting (Gmax), s	5.5	26.5		5.0	5.8	26.2		39.0
Max Q Clear Time (g_c+I1), s	6.9	23.8		7.0	6.9	17.3		24.0
Green Ext Time (p_c), s	0.0	1.7		0.0	0.0	4.4		2.3

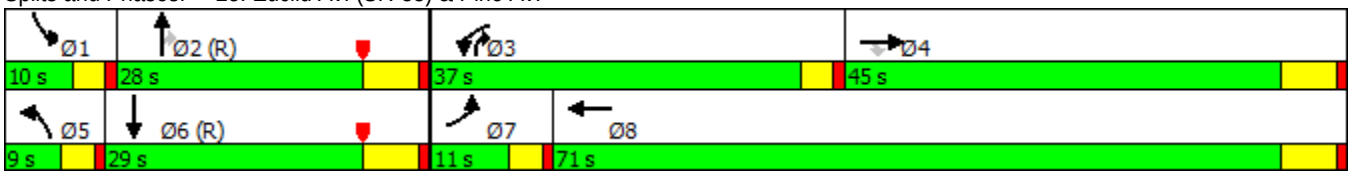
Intersection Summary	
HCM 2010 Ctrl Delay	33.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	223	33	897	169	59	950	506	87	925
Future Volume (vph)	5	223	33	897	169	59	950	506	87	925
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	11.0	45.0	45.0	37.0	71.0	9.0	28.0	37.0	10.0	29.0
Total Split (%)	9.2%	37.5%	37.5%	30.8%	59.2%	7.5%	23.3%	30.8%	8.3%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.3	23.1	23.1	33.0	58.1	9.0	31.5	66.5	12.5	35.0
Actuated g/C Ratio	0.04	0.19	0.19	0.28	0.48	0.08	0.26	0.55	0.10	0.29
v/c Ratio	0.07	0.65	0.08	1.12	0.34	0.50	0.74	0.50	0.53	0.66
Control Delay	57.0	52.5	0.4	109.9	16.5	66.3	36.2	2.0	63.7	41.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	52.5	0.4	109.9	16.5	66.3	36.2	2.0	63.7	41.4
LOS	E	D	A	F	B	E	D	A	E	D
Approach Delay		46.1			87.5		26.0			43.3
Approach LOS		D			F		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 40 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 50.0	Intersection LOS: D
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	223	33	897	169	114	59	950	506	87	925	15
Future Volume (veh/h)	5	223	33	897	169	114	59	950	506	87	925	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	225	0	906	171	100	60	960	333	88	934	10
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	302	257	813	463	271	67	1673	930	81	1748	19
Arrive On Green	0.01	0.17	0.00	0.28	0.44	0.44	0.04	0.34	0.34	0.05	0.35	0.35
Sat Flow, veh/h	1619	1800	1530	2956	1061	620	1619	4914	1496	1619	5012	54
Grp Volume(v), veh/h	5	225	0	906	0	271	60	960	333	88	610	334
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1681	1619	1638	1496	1619	1638	1789
Q Serve(g_s), s	0.4	14.3	0.0	33.0	0.0	13.0	4.4	19.2	13.2	6.0	17.9	17.9
Cycle Q Clear(g_c), s	0.4	14.3	0.0	33.0	0.0	13.0	4.4	19.2	13.2	6.0	17.9	17.9
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	302	257	813	0	734	67	1673	930	81	1143	624
V/C Ratio(X)	0.48	0.74	0.00	1.11	0.00	0.37	0.89	0.57	0.36	1.09	0.53	0.53
Avail Cap(c_a), veh/h	94	585	497	813	0	911	67	1673	930	81	1143	624
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.14	0.14	0.14	0.76	0.76	0.76
Uniform Delay (d), s/veh	59.4	47.5	0.0	43.5	0.0	22.7	57.2	32.4	11.4	57.0	31.3	31.3
Incr Delay (d2), s/veh	12.4	5.1	0.0	67.9	0.0	0.4	17.8	0.2	0.2	112.7	1.4	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.6	0.0	21.1	0.0	6.1	2.3	8.7	5.4	5.2	8.3	9.2
LnGrp Delay(d),s/veh	71.8	52.6	0.0	111.4	0.0	23.2	75.0	32.6	11.6	170.3	32.6	33.8
LnGrp LOS	E	D		F		C	E	C	B	F	C	C
Approach Vol, veh/h		230			1177			1353			1032	
Approach Delay, s/veh		53.0			91.1			29.3			44.7	
Approach LOS		D			F			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	46.9	37.0	26.1	9.0	47.9	4.8	58.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	22.0	33.0	39.0	5.0	23.0	7.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	21.2	35.0	16.3	6.4	19.9	2.4	15.0
Green Ext Time (p_c), s	0.0	0.6	0.0	3.9	0.0	2.3	0.0	4.5

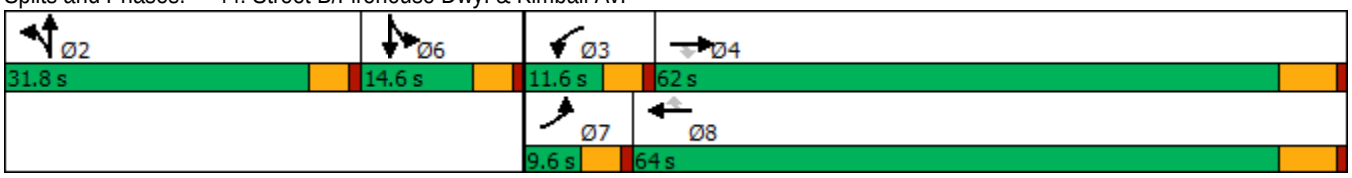
Intersection Summary	
HCM 2010 Ctrl Delay	54.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	3	964	93	34	1387	0	0
Future Volume (vph)	3	964	93	34	1387	0	0
Turn Type	Prot	NA	Perm	Prot	NA	NA	NA
Protected Phases	7	4		3	8	2	6
Permitted Phases			4				
Detector Phase	7	4	4	3	8	2	6
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	24.2	9.6	16.2	31.6	14.6
Total Split (s)	9.6	62.0	62.0	11.6	64.0	31.8	14.6
Total Split (%)	8.0%	51.7%	51.7%	9.7%	53.3%	26.5%	12.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	Min
Act Effct Green (s)	5.2	41.8	41.8	6.3	46.7	12.8	10.3
Actuated g/C Ratio	0.06	0.48	0.48	0.07	0.54	0.15	0.12
v/c Ratio	0.03	0.61	0.11	0.30	0.83	0.08	0.00
Control Delay	48.3	19.8	4.1	51.0	23.0	0.4	44.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	19.8	4.1	51.0	23.0	0.4	44.0
LOS	D	B	A	D	C	A	D
Approach Delay		18.5			23.7	0.4	44.0
Approach LOS		B			C	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 87.2	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 21.3	Intersection LOS: C
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	964	93	34	1387	0	18	0	7	1	0	0
Future Volume (veh/h)	3	964	93	34	1387	0	18	0	7	1	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	3	1059	53	37	1524	0	20	0	8	1	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	1808	768	55	1820	814	137	0	55	199	0	0
Arrive On Green	0.00	0.50	0.50	0.03	0.53	0.00	0.12	0.00	0.12	0.12	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	3420	1530	1184	0	473	1714	0	0
Grp Volume(v), veh/h	3	1059	53	37	1524	0	28	0	0	1	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1710	1530	1657	0	0	1714	0	0
Q Serve(g_s), s	0.2	17.9	1.5	1.9	32.4	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	17.9	1.5	1.9	32.4	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.71		0.29	1.00		0.00
Lane Grp Cap(c), veh/h	7	1808	768	55	1820	814	192	0	0	199	0	0
V/C Ratio(X)	0.46	0.59	0.07	0.67	0.84	0.00	0.15	0.00	0.00	0.01	0.00	0.00
Avail Cap(c_a), veh/h	94	2329	990	131	2292	1025	523	0	0	199	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.9	15.1	11.1	41.2	17.0	0.0	34.3	0.0	0.0	33.7	0.0	0.0
Incr Delay (d2), s/veh	17.7	0.3	0.0	5.1	2.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.9	0.7	1.0	15.8	0.0	0.6	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	60.5	15.4	11.1	46.3	19.4	0.0	34.6	0.0	0.0	33.7	0.0	0.0
LnGrp LOS	E	B	B	D	B		C			C		
Approach Vol, veh/h		1115			1561			28			1	
Approach Delay, s/veh		15.4			20.0			34.6			33.7	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.6	7.5	49.5		14.6	4.9	52.1
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		27.2	7.0	55.8		10.0	5.0	57.8
Max Q Clear Time (g_c+I1), s		3.3	3.9	19.9		2.0	2.2	34.4
Green Ext Time (p_c), s		0.1	0.0	8.3		0.0	0.0	11.5

Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	402	413	5	480	19	20	96	13
Future Volume (vph)	402	413	5	480	19	20	96	13
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	31.0	48.8	9.6	27.4	31.6	31.6	31.6	31.6
Total Split (%)	34.4%	54.2%	10.7%	30.4%	35.1%	35.1%	35.1%	35.1%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	24.1	46.5	5.1	19.4		23.1		23.1
Actuated g/C Ratio	0.29	0.56	0.06	0.24		0.28		0.28
v/c Ratio	0.90	0.23	0.05	0.82		0.14		0.84
Control Delay	53.0	10.5	41.4	41.0		24.2		48.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	53.0	10.5	41.4	41.0		24.2		48.0
LOS	D	B	D	D		C		D
Approach Delay		31.1		41.0		24.2		48.0
Approach LOS		C		D		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 82.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 37.2	Intersection LOS: D
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	402	413	11	5	480	124	19	20	18	96	13	213
Future Volume (veh/h)	402	413	11	5	480	124	19	20	18	96	13	213
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	423	435	12	5	505	131	20	21	19	101	14	224
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	461	1775	49	11	654	169	156	157	115	162	36	262
Arrive On Green	0.28	0.52	0.52	0.01	0.24	0.24	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1619	3397	94	1619	2678	691	346	599	438	377	136	999
Grp Volume(v), veh/h	423	219	228	5	321	315	60	0	0	339	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1781	1619	1710	1659	1384	0	0	1512	0	0
Q Serve(g_s), s	18.7	5.2	5.2	0.2	12.9	13.1	0.0	0.0	0.0	12.7	0.0	0.0
Cycle Q Clear(g_c), s	18.7	5.2	5.2	0.2	12.9	13.1	2.0	0.0	0.0	15.7	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.42	0.33		0.32	0.30		0.66
Lane Grp Cap(c), veh/h	461	893	930	11	418	405	428	0	0	460	0	0
V/C Ratio(X)	0.92	0.24	0.25	0.47	0.77	0.78	0.14	0.00	0.00	0.74	0.00	0.00
Avail Cap(c_a), veh/h	579	987	1028	110	491	476	578	0	0	615	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.5	9.6	9.7	36.5	26.0	26.0	20.8	0.0	0.0	25.8	0.0	0.0
Incr Delay (d2), s/veh	15.4	0.1	0.1	11.3	6.2	6.8	0.1	0.0	0.0	3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.3	2.5	2.6	0.1	6.8	6.7	1.0	0.0	0.0	6.9	0.0	0.0
LnGrp Delay(d),s/veh	41.0	9.8	9.8	47.9	32.2	32.8	21.0	0.0	0.0	29.0	0.0	0.0
LnGrp LOS	D	A	A	D	C	C	C			C		
Approach Vol, veh/h		870			641			60			339	
Approach Delay, s/veh		25.0			32.6			21.0			29.0	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	44.8		24.0	25.6	24.2		24.0
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	42.6		27.0	26.4	21.2		27.0
Max Q Clear Time (g_c+I1), s	2.2	7.2		17.7	20.7	15.1		4.0
Green Ext Time (p_c), s	0.0	6.6		1.6	0.4	3.0		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	28.1
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	230	197	306	465	120	255
Future Volume (vph)	230	197	306	465	120	255
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	24.0	56.8	32.8	32.8
Total Split (%)	36.9%	36.9%	26.7%	63.1%	36.4%	36.4%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	15.6	13.9	18.5	36.3	13.0	13.0
Actuated g/C Ratio	0.25	0.22	0.30	0.58	0.21	0.21
v/c Ratio	0.62	0.42	0.69	0.48	0.34	0.51
Control Delay	29.1	6.5	32.2	10.3	25.1	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	6.5	32.2	10.3	25.1	7.1
LOS	C	A	C	B	C	A
Approach Delay				19.0	12.9	
Approach LOS				B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 62.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 48.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	0	197	0	0	0	306	465	0	0	120	255
Future Volume (veh/h)	230	0	197	0	0	0	306	465	0	0	120	255
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	247	0	212				329	500	0	0	129	274
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	316	0	299				384	1086	0	0	499	424
Arrive On Green	0.20	0.00	0.20				0.24	0.60	0.00	0.00	0.28	0.28
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1530
Grp Volume(v), veh/h	247	0	212				329	500	0	0	129	274
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1530
Q Serve(g_s), s	7.5	0.0	6.7				10.1	7.9	0.0	0.0	2.9	8.1
Cycle Q Clear(g_c), s	7.5	0.0	6.7				10.1	7.9	0.0	0.0	2.9	8.1
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	316	0	299				384	1086	0	0	499	424
V/C Ratio(X)	0.78	0.00	0.71				0.86	0.46	0.00	0.00	0.26	0.65
Avail Cap(c_a), veh/h	896	0	847				608	1777	0	0	941	799
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	19.4				18.9	5.6	0.0	0.0	14.5	16.4
Incr Delay (d2), s/veh	1.6	0.0	1.2				4.1	0.3	0.0	0.0	0.3	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	5.5				4.9	3.8	0.0	0.0	1.5	6.9
LnGrp Delay(d),s/veh	21.3	0.0	20.6				23.0	5.9	0.0	0.0	14.8	18.1
LnGrp LOS	C		C				C	A			B	B
Approach Vol, veh/h		459						829			403	
Approach Delay, s/veh		21.0						12.7			17.0	
Approach LOS		C						B			B	

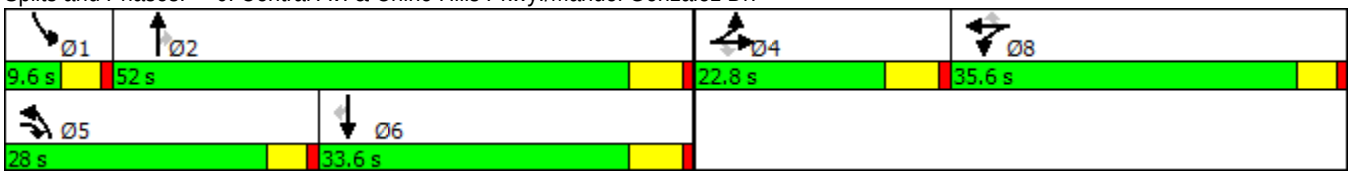
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		37.0		14.7	16.8	20.1		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		51.0		28.6	19.4	27.0		
Max Q Clear Time (g_c+I1), s		9.9		9.5	12.1	10.1		
Green Ext Time (p_c), s		5.0		0.6	0.3	4.2		

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	504	2	430	12	42	34	361	770	1	11	862	236
Future Volume (vph)	504	2	430	12	42	34	361	770	1	11	862	236
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	5	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	22.8	22.8	28.0	35.6	35.6	35.6	28.0	52.0	52.0	9.6	33.6	33.6
Total Split (%)	19.0%	19.0%	23.3%	29.7%	29.7%	29.7%	23.3%	43.3%	43.3%	8.0%	28.0%	28.0%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	17.2	17.2	43.2	13.6	13.6	13.6	23.7	54.9	54.9	5.1	28.2	28.2
Actuated g/C Ratio	0.17	0.17	0.43	0.14	0.14	0.14	0.24	0.55	0.55	0.05	0.28	0.28
v/c Ratio	1.04	0.99	0.51	0.06	0.19	0.11	1.03	0.45	0.00	0.15	0.98	0.48
Control Delay	110.0	95.5	3.2	37.7	40.3	0.6	94.0	17.4	0.0	54.5	61.4	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.0	95.5	3.2	37.7	40.3	0.6	94.0	17.4	0.0	54.5	61.4	17.5
LOS	F	F	A	D	D	A	F	B	A	D	E	B
Approach Delay		57.1			24.7			41.8			52.0	
Approach LOS		E			C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 49.2	Intersection LOS: D
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	504	2	430	12	42	34	361	770	1	11	862	236
Future Volume (veh/h)	504	2	430	12	42	34	361	770	1	11	862	236
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	549	0	339	13	46	20	392	837	1	12	937	187
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	559	0	628	156	173	146	385	1730	773	23	966	426
Arrive On Green	0.17	0.00	0.17	0.10	0.10	0.10	0.24	0.51	0.51	0.01	0.28	0.28
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	549	0	339	13	46	20	392	837	1	12	937	187
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	16.6	0.0	16.5	0.7	2.3	1.2	23.4	15.8	0.0	0.7	26.7	10.0
Cycle Q Clear(g_c), s	16.6	0.0	16.5	0.7	2.3	1.2	23.4	15.8	0.0	0.7	26.7	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	559	0	628	156	173	146	385	1730	773	23	966	426
V/C Ratio(X)	0.98	0.00	0.54	0.08	0.27	0.14	1.02	0.48	0.00	0.52	0.97	0.44
Avail Cap(c_a), veh/h	559	0	628	510	567	479	385	1730	773	82	966	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	0.0	22.0	40.6	41.3	40.8	37.5	15.9	12.0	48.2	34.9	28.9
Incr Delay (d2), s/veh	33.3	0.0	0.9	0.2	0.8	0.4	50.7	1.0	0.0	6.6	22.6	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	0.0	7.1	0.3	1.2	0.5	15.8	7.7	0.0	0.4	15.7	4.5
LnGrp Delay(d),s/veh	73.9	0.0	22.9	40.8	42.1	41.2	88.3	16.9	12.0	54.8	57.5	32.2
LnGrp LOS	E		C	D	D	D	F	B	B	D	E	C
Approach Vol, veh/h		888			79			1230			1136	
Approach Delay, s/veh		54.4			41.6			39.6			53.3	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	55.6		22.8	28.0	33.6		14.1
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	46.2		17.0	23.4	27.8		31.0
Max Q Clear Time (g_c+I1), s	2.7	17.8		18.6	25.4	28.7		4.3
Green Ext Time (p_c), s	0.0	19.8		0.0	0.0	0.0		0.3

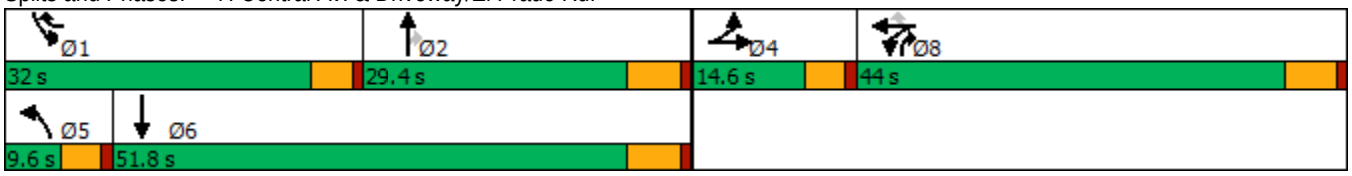
Intersection Summary	
HCM 2010 Ctrl Delay	48.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	27	5	789	4	511	9	583	846	588	723
Future Volume (vph)	27	5	789	4	511	9	583	846	588	723
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	44.0	44.0	32.0	9.6	29.4	44.0	32.0	51.8
Total Split (%)	12.2%	12.2%	36.7%	36.7%	26.7%	8.0%	24.5%	36.7%	26.7%	43.2%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.2	10.2	35.6	35.6	66.3	5.1	24.3	59.9	24.8	52.0
Actuated g/C Ratio	0.09	0.09	0.32	0.32	0.59	0.05	0.22	0.53	0.22	0.46
v/c Ratio	0.19	0.17	0.85	0.80	0.54	0.12	0.82	0.91	0.89	0.34
Control Delay	54.7	25.8	54.1	49.5	9.8	59.2	54.3	26.7	59.1	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	25.8	54.1	49.5	9.8	59.2	54.3	26.7	59.1	21.3
LOS	D	C	D	D	A	E	D	C	E	C
Approach Delay		40.5		35.3			38.1			38.1
Approach LOS		D		D			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 37.2	Intersection LOS: D
Intersection Capacity Utilization 95.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	5	21	789	4	511	9	583	846	588	723	18
Future Volume (veh/h)	27	5	21	789	4	511	9	583	846	588	723	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	28	5	13	825	0	381	9	607	705	612	753	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	113	31	80	950	0	778	18	776	791	675	2137	42
Arrive On Green	0.07	0.07	0.07	0.29	0.00	0.29	0.01	0.23	0.23	0.22	0.43	0.43
Sat Flow, veh/h	1619	443	1153	3238	0	1530	1619	3420	1508	3141	4958	99
Grp Volume(v), veh/h	28	0	18	825	0	381	9	607	705	612	497	271
Grp Sat Flow(s),veh/h/ln	1619	0	1597	1619	0	1530	1619	1710	1508	1570	1638	1780
Q Serve(g_s), s	1.7	0.0	1.1	25.8	0.0	17.4	0.6	17.8	24.2	20.3	10.9	10.9
Cycle Q Clear(g_c), s	1.7	0.0	1.1	25.8	0.0	17.4	0.6	17.8	24.2	20.3	10.9	10.9
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	113	0	111	950	0	778	18	776	791	675	1412	767
V/C Ratio(X)	0.25	0.00	0.16	0.87	0.00	0.49	0.51	0.78	0.89	0.91	0.35	0.35
Avail Cap(c_a), veh/h	152	0	150	1159	0	877	76	776	791	806	1412	767
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	0.0	46.7	35.8	0.0	17.2	52.5	38.8	18.1	40.8	20.4	20.4
Incr Delay (d2), s/veh	0.4	0.0	0.2	6.2	0.0	0.5	8.1	7.7	14.4	11.3	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	12.3	0.0	7.5	0.3	9.3	23.7	9.8	5.0	5.6
LnGrp Delay(d),s/veh	47.4	0.0	47.0	42.0	0.0	17.7	60.5	46.5	32.5	52.1	21.1	21.6
LnGrp LOS	D		D	D		B	E	D	C	D	C	C
Approach Vol, veh/h		46			1206			1321			1380	
Approach Delay, s/veh		47.2			34.3			39.1			35.0	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	27.5	30.0		12.0	5.8	51.8		37.1
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	27.4	23.6		10.0	5.0	46.0		38.2
Max Q Clear Time (g_c+I1), s	22.3	26.2		3.7	2.6	12.9		27.8
Green Ext Time (p_c), s	0.7	0.0		0.0	0.0	7.3		3.5

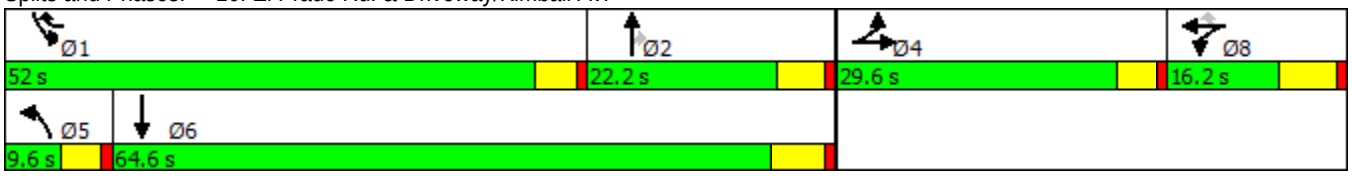
Intersection Summary	
HCM 2010 Ctrl Delay	36.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	36	8	3	945	4	206	24	1018	359
Future Volume (vph)	36	8	3	945	4	206	24	1018	359
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	52.0	9.6	22.2	22.2	52.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	43.3%	8.0%	18.5%	18.5%	43.3%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	14.1	14.1	12.0	47.0	6.0	16.3	16.3	39.5	49.0
Actuated g/C Ratio	0.17	0.17	0.14	0.56	0.07	0.19	0.19	0.47	0.58
v/c Ratio	0.14	0.06	0.11	0.89	0.03	0.62	0.06	0.73	0.38
Control Delay	41.4	29.7	47.3	19.4	52.5	48.4	0.2	25.6	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	29.7	47.3	19.4	52.5	48.4	0.2	25.6	14.3
LOS	D	C	D	B	D	D	A	C	B
Approach Delay		37.9	20.2			43.6			22.6
Approach LOS		D	C			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 83.9	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 93.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	8	8	23	3	945	4	206	24	1018	359	14
Future Volume (veh/h)	36	8	8	23	3	945	4	206	24	1018	359	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	38	8	6	24	3	544	4	217	24	1072	378	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	137	81	61	187	23	760	99	288	245	1176	817	30
Arrive On Green	0.08	0.08	0.08	0.12	0.12	0.12	0.06	0.16	0.16	0.37	0.47	0.47
Sat Flow, veh/h	1619	956	717	1532	191	1530	1619	1800	1530	3141	1725	64
Grp Volume(v), veh/h	38	0	14	27	0	544	4	217	24	1072	0	392
Grp Sat Flow(s),veh/h/ln	1619	0	1673	1723	0	1530	1619	1800	1530	1570	0	1788
Q Serve(g_s), s	1.8	0.0	0.6	1.1	0.0	10.0	0.2	9.4	1.1	26.6	0.0	12.1
Cycle Q Clear(g_c), s	1.8	0.0	0.6	1.1	0.0	10.0	0.2	9.4	1.1	26.6	0.0	12.1
Prop In Lane	1.00		0.43	0.89		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	137	0	142	210	0	760	99	288	245	1176	0	847
V/C Ratio(X)	0.28	0.00	0.10	0.13	0.00	0.72	0.04	0.75	0.10	0.91	0.00	0.46
Avail Cap(c_a), veh/h	494	0	511	210	0	760	99	373	317	1817	0	1283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	0.0	34.6	32.1	0.0	16.1	36.2	32.9	29.4	24.3	0.0	14.5
Incr Delay (d2), s/veh	1.1	0.0	0.3	0.3	0.0	3.2	0.1	6.2	0.2	3.6	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.3	0.6	0.0	10.2	0.1	5.2	0.5	12.0	0.0	6.1
LnGrp Delay(d),s/veh	36.2	0.0	34.9	32.4	0.0	19.4	36.3	39.0	29.5	27.9	0.0	14.9
LnGrp LOS	D		C	C		B	D	D	C	C		B
Approach Vol, veh/h		52			571			245			1464	
Approach Delay, s/veh		35.9			20.0			38.1			24.4	
Approach LOS		D			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	35.3	18.9		11.5	9.6	44.6		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	47.4	* 17		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	28.6	11.4		3.8	2.2	14.1		12.0
Green Ext Time (p_c), s	2.1	1.7		0.1	0.0	3.8		0.0

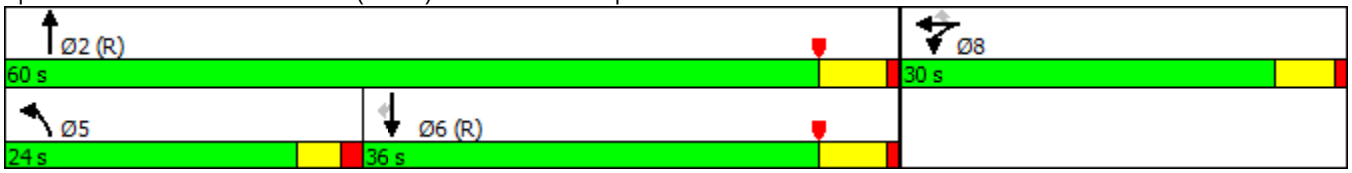
Intersection Summary	
HCM 2010 Ctrl Delay	25.0
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	653	6	422	570	1082	948	549
Future Volume (vph)	653	6	422	570	1082	948	549
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	24.0	60.0	36.0	36.0
Total Split (%)	33.3%	33.3%	33.3%	26.7%	66.7%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.3	24.3	24.3	19.0	55.2	31.7	31.7
Actuated g/C Ratio	0.27	0.27	0.27	0.21	0.61	0.35	0.35
v/c Ratio	0.95	0.92	0.79	0.91	0.54	0.83	0.64
Control Delay	66.6	60.4	37.0	43.5	18.6	34.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	1.7	0.0	0.0
Total Delay	66.6	60.4	37.0	43.5	20.4	34.4	5.8
LOS	E	E	D	D	C	C	A
Approach Delay		55.2			28.3	23.9	
Approach LOS		E			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 51 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 33.6	Intersection LOS: C
Intersection Capacity Utilization 93.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	653	6	422	570	1082	0	0	948	549
Future Volume (veh/h)	0	0	0	653	6	422	570	1082	0	0	948	549
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				779	0	195	600	1139	0	0	998	578
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				849	0	396	668	2124	0	0	1226	538
Arrive On Green				0.26	0.00	0.26	0.07	0.20	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3238	0	1510	3141	3510	0	0	3510	1500
Grp Volume(v), veh/h				779	0	195	600	1139	0	0	998	578
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1570	1710	0	0	1710	1500
Q Serve(g_s), s				21.0	0.0	9.8	17.1	26.8	0.0	0.0	23.8	32.3
Cycle Q Clear(g_c), s				21.0	0.0	9.8	17.1	26.8	0.0	0.0	23.8	32.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				849	0	396	668	2124	0	0	1226	538
V/C Ratio(X)				0.92	0.00	0.49	0.90	0.54	0.00	0.00	0.81	1.08
Avail Cap(c_a), veh/h				899	0	420	681	2124	0	0	1226	538
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.46	0.46	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.3	0.0	28.1	40.9	24.2	0.0	0.0	26.2	28.9
Incr Delay (d2), s/veh				13.1	0.0	0.4	7.4	0.5	0.0	0.0	6.0	60.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.0	0.0	4.2	8.1	12.8	0.0	0.0	12.3	22.3
LnGrp Delay(d),s/veh				45.4	0.0	28.5	48.2	24.6	0.0	0.0	32.2	89.5
LnGrp LOS				D		C	D	C			C	F
Approach Vol, veh/h					974			1739			1576	
Approach Delay, s/veh					42.0			32.8			53.2	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.4			23.6	37.8		28.6
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		54.5			19.5	30.5		25.0
Max Q Clear Time (g_c+I1), s		28.8			19.1	34.3		23.0
Green Ext Time (p_c), s		22.7			0.1	0.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	42.4
HCM 2010 LOS	D

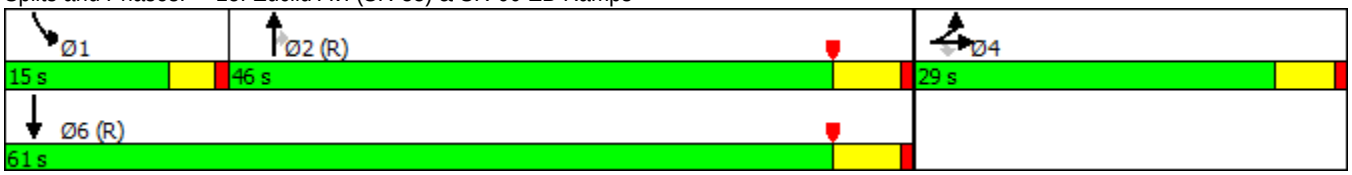
Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	392	2	562	1261	811	313	1288
Future Volume (vph)	392	2	562	1261	811	313	1288
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	29.0	46.0	46.0	15.0	61.0
Total Split (%)	32.2%	32.2%	32.2%	51.1%	51.1%	16.7%	67.8%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.3	22.3	22.3	42.1	42.1	11.1	57.2
Actuated g/C Ratio	0.25	0.25	0.25	0.47	0.47	0.12	0.64
v/c Ratio	0.89	0.80	0.75	0.80	0.75	0.83	0.60
Control Delay	59.3	41.5	35.1	25.9	7.6	49.6	2.5
Queue Delay	4.4	1.7	0.0	0.0	0.0	0.0	0.5
Total Delay	63.7	43.1	35.1	25.9	7.6	49.6	3.0
LOS	E	D	D	C	A	D	A
Approach Delay		47.7		18.7			12.1
Approach LOS		D		B			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 22.4 — Intersection LOS: C
Intersection Capacity Utilization 93.2% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	392	2	562	0	0	0	0	1261	811	313	1288	0
Future Volume (veh/h)	392	2	562	0	0	0	0	1261	811	313	1288	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	570	0	316				0	1287	828	319	1314	0
Adj No. of Lanes	2	0	1				0	2	1	2	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	750	0	355				0	1659	730	384	2229	0
Arrive On Green	0.23	0.00	0.23				0.00	0.48	0.48	0.08	0.44	0.00
Sat Flow, veh/h	3238	0	1530				0	3510	1505	3141	3510	0
Grp Volume(v), veh/h	570	0	316				0	1287	828	319	1314	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1505	1570	1710	0
Q Serve(g_s), s	14.8	0.0	18.0				0.0	28.0	43.6	9.0	26.2	0.0
Cycle Q Clear(g_c), s	14.8	0.0	18.0				0.0	28.0	43.6	9.0	26.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	750	0	355				0	1659	730	384	2229	0
V/C Ratio(X)	0.76	0.00	0.89				0.00	0.78	1.13	0.83	0.59	0.00
Avail Cap(c_a), veh/h	863	0	408				0	1659	730	384	2229	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.51	0.51	0.39	0.39	0.00
Uniform Delay (d), s/veh	32.2	0.0	33.5				0.0	19.1	23.2	40.4	16.2	0.0
Incr Delay (d2), s/veh	2.8	0.0	17.9				0.0	1.9	69.8	5.7	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	0.0	9.3				0.0	13.5	32.2	4.2	12.5	0.0
LnGrp Delay(d),s/veh	35.0	0.0	51.3				0.0	21.0	92.9	46.1	16.7	0.0
LnGrp LOS	D		D					C	F	D	B	
Approach Vol, veh/h		886						2115			1633	
Approach Delay, s/veh		40.8						49.2			22.4	
Approach LOS		D						D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.0	49.1		25.9		64.1		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	11.0	40.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	11.0	45.6		20.0		28.2		
Green Ext Time (p_c), s	0.0	0.0		0.9		26.1		

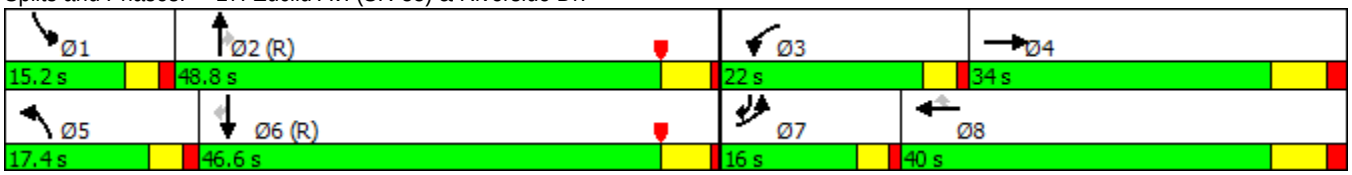
Intersection Summary	
HCM 2010 Ctrl Delay	38.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	152	391	179	351	56	111	1623	283	132	1220	168
Future Volume (vph)	152	391	179	351	56	111	1623	283	132	1220	168
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	16.0	34.0	22.0	40.0	40.0	17.4	48.8	48.8	15.2	46.6	16.0
Total Split (%)	13.3%	28.3%	18.3%	33.3%	33.3%	14.5%	40.7%	40.7%	12.7%	38.8%	13.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.0	24.0	16.6	28.5	28.5	12.3	45.2	45.2	13.2	46.2	59.7
Actuated g/C Ratio	0.10	0.20	0.14	0.24	0.24	0.10	0.38	0.38	0.11	0.38	0.50
v/c Ratio	1.01	0.76	0.86	0.46	0.14	0.72	0.94	0.42	0.80	0.69	0.21
Control Delay	128.0	51.0	83.8	40.4	2.1	53.2	52.6	17.3	68.0	28.6	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	128.0	51.0	83.8	40.4	2.1	53.2	52.6	17.3	68.0	28.6	10.9
LOS	F	D	F	D	A	D	D	B	E	C	B
Approach Delay		69.4		50.0			47.7			30.0	
Approach LOS		E		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 45.2	Intersection LOS: D
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	391	92	179	351	56	111	1623	283	132	1220	168
Future Volume (veh/h)	152	391	92	179	351	56	111	1623	283	132	1220	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	163	420	65	192	377	60	119	1745	173	142	1312	83
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	558	86	216	756	333	143	2038	635	144	2041	779
Arrive On Green	0.10	0.19	0.19	0.13	0.22	0.22	0.03	0.14	0.14	0.03	0.14	0.14
Sat Flow, veh/h	1619	2972	457	1619	3420	1507	1619	4914	1530	1619	4914	1508
Grp Volume(v), veh/h	163	240	245	192	377	60	119	1745	173	142	1312	83
Grp Sat Flow(s),veh/h/ln	1619	1710	1719	1619	1710	1507	1619	1638	1530	1619	1638	1508
Q Serve(g_s), s	12.0	16.0	16.2	14.0	11.6	3.9	8.8	41.7	12.2	10.5	30.3	4.8
Cycle Q Clear(g_c), s	12.0	16.0	16.2	14.0	11.6	3.9	8.8	41.7	12.2	10.5	30.3	4.8
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	321	323	216	756	333	143	2038	635	144	2041	779
V/C Ratio(X)	1.01	0.75	0.76	0.89	0.50	0.18	0.83	0.86	0.27	0.98	0.64	0.11
Avail Cap(c_a), veh/h	162	385	387	243	941	414	174	2038	635	144	2041	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.37	0.37	0.37	0.75	0.75	0.75
Uniform Delay (d), s/veh	54.0	46.1	46.2	51.1	40.9	37.9	57.4	48.3	35.6	58.1	43.3	22.5
Incr Delay (d2), s/veh	72.5	7.6	8.0	26.7	0.7	0.4	10.1	1.9	0.4	59.8	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	8.2	8.4	7.8	5.5	1.6	4.3	19.3	5.2	7.1	14.0	2.1
LnGrp Delay(d),s/veh	126.5	53.6	54.2	77.8	41.6	38.3	67.5	50.2	36.0	118.0	44.5	22.7
LnGrp LOS	F	D	D	E	D	D	E	D	D	F	D	C
Approach Vol, veh/h		648			629			2037			1537	
Approach Delay, s/veh		72.2			52.3			50.0			50.1	
Approach LOS		E			D			D			D	

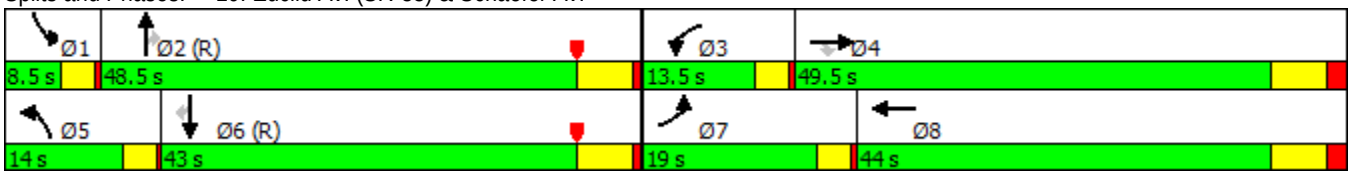
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	55.3	20.0	29.5	15.1	55.3	16.0	33.5
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	10.7	43.3	18.0	27.0	12.9	41.1	12.0	33.0
Max Q Clear Time (g_c+I1), s	12.5	43.7	16.0	18.2	10.8	32.3	14.0	13.6
Green Ext Time (p_c), s	0.0	0.0	0.1	4.4	0.0	8.3	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	53.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	306	230	190	28	50	125	1945	44	23	1354	134
Future Volume (vph)	306	230	190	28	50	125	1945	44	23	1354	134
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	19.0	49.5	49.5	13.5	44.0	14.0	48.5	48.5	8.5	43.0	43.0
Total Split (%)	15.8%	41.3%	41.3%	11.3%	36.7%	11.7%	40.4%	40.4%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.8	25.2	25.2	10.0	16.4	14.0	67.7	67.7	5.9	56.2	56.2
Actuated g/C Ratio	0.13	0.21	0.21	0.08	0.14	0.12	0.56	0.56	0.05	0.47	0.47
v/c Ratio	1.49	0.63	0.41	0.22	0.27	0.69	0.72	0.05	0.30	0.61	0.18
Control Delay	278.9	49.4	7.0	55.6	36.0	47.2	33.2	3.2	62.0	27.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	278.9	49.4	7.0	55.6	36.0	47.2	33.2	3.2	62.0	27.5	8.0
LOS	F	D	A	E	D	D	C	A	E	C	A
Approach Delay		134.9			41.9		33.4			26.3	
Approach LOS		F			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.49	
Intersection Signal Delay: 47.8	Intersection LOS: D
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	230	190	28	50	15	125	1945	44	23	1354	134
Future Volume (veh/h)	306	230	190	28	50	15	125	1945	44	23	1354	134
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	315	237	120	29	52	10	129	2005	36	24	1396	85
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	209	282	240	84	116	22	142	2958	921	37	2640	804
Arrive On Green	0.13	0.16	0.16	0.05	0.08	0.08	0.06	0.40	0.40	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1468	282	1619	4914	1530	1619	4914	1496
Grp Volume(v), veh/h	315	237	120	29	0	62	129	2005	36	24	1396	85
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1750	1619	1638	1530	1619	1638	1496
Q Serve(g_s), s	15.5	15.3	8.6	2.1	0.0	4.1	9.5	40.2	1.7	1.8	30.9	5.7
Cycle Q Clear(g_c), s	15.5	15.3	8.6	2.1	0.0	4.1	9.5	40.2	1.7	1.8	30.9	5.7
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	209	282	240	84	0	139	142	2958	921	37	2640	804
V/C Ratio(X)	1.51	0.84	0.50	0.35	0.00	0.45	0.91	0.68	0.04	0.65	0.53	0.11
Avail Cap(c_a), veh/h	209	638	542	135	0	540	142	2958	921	67	2640	804
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.50	0.50	0.50	0.67	0.67	0.67
Uniform Delay (d), s/veh	52.3	49.1	46.3	54.9	0.0	52.7	56.0	26.3	14.8	59.1	35.6	25.2
Incr Delay (d2), s/veh	251.1	5.0	1.2	0.9	0.0	1.7	30.5	0.6	0.0	4.6	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.5	8.0	3.7	0.9	0.0	2.0	5.5	18.4	0.7	0.8	14.2	2.4
LnGrp Delay(d),s/veh	303.3	54.1	47.5	55.9	0.0	54.4	86.6	26.9	14.8	63.7	36.1	25.4
LnGrp LOS	F	D	D	E		D	F	C	B	E	D	C
Approach Vol, veh/h		672			91			2170			1505	
Approach Delay, s/veh		169.7			54.9			30.2			35.9	
Approach LOS		F			D			C			D	

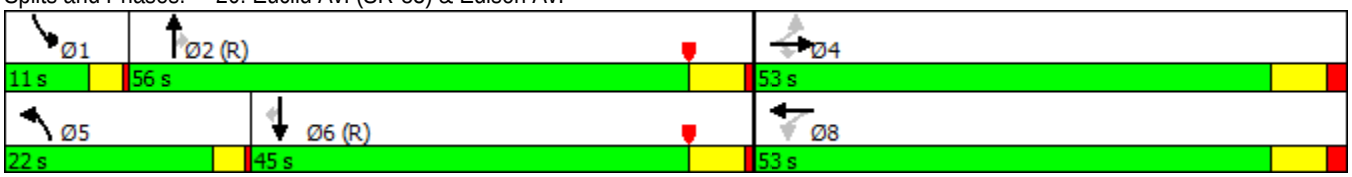
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	78.2	9.7	25.8	14.0	70.5	19.0	16.5
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	42.5	10.0	42.5	10.5	37.0	15.5	37.0
Max Q Clear Time (g_c+I1), s	3.8	42.2	4.1	17.3	11.5	32.9	17.5	6.1
Green Ext Time (p_c), s	0.0	0.3	0.0	1.5	0.0	3.9	0.0	1.5

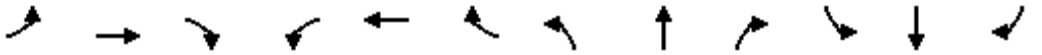
Intersection Summary	
HCM 2010 Ctrl Delay	53.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	350	480	287	30	143	183	1697	81	70	1325	172
Future Volume (vph)	350	480	287	30	143	183	1697	81	70	1325	172
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	22.0	56.0	56.0	11.0	45.0	45.0
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%	18.3%	46.7%	46.7%	9.2%	37.5%	37.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.4	43.4	43.4	43.4	43.4	16.6	54.6	54.6	7.4	43.5	43.5
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.14	0.46	0.46	0.06	0.36	0.36
v/c Ratio	0.93	0.75	0.40	0.21	0.28	0.84	0.77	0.11	0.72	0.76	0.27
Control Delay	69.0	41.5	4.5	29.3	26.0	53.7	43.7	15.4	113.1	16.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.0	41.5	4.5	29.3	26.0	53.7	43.7	15.4	113.1	16.8	2.5
LOS	E	D	A	C	C	D	D	B	F	B	A
Approach Delay		40.6			26.5		43.5			19.5	
Approach LOS		D			C		D			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 34.4	Intersection LOS: C
Intersection Capacity Utilization 90.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	480	287	30	143	31	183	1697	81	70	1325	172
Future Volume (veh/h)	350	480	287	30	143	31	183	1697	81	70	1325	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	357	490	201	31	146	27	187	1732	63	71	1352	149
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	427	690	578	170	567	105	213	2089	651	87	1707	532
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.14	0.14	0.11	0.69	0.69
Sat Flow, veh/h	1163	1800	1508	722	1478	273	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	357	490	201	31	0	173	187	1732	63	71	1352	149
Grp Sat Flow(s),veh/h/ln	1163	1800	1508	722	0	1752	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	36.4	27.7	11.4	4.6	0.0	8.1	13.8	41.1	4.3	5.1	22.4	4.4
Cycle Q Clear(g_c), s	44.5	27.7	11.4	32.2	0.0	8.1	13.8	41.1	4.3	5.1	22.4	4.4
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	427	690	578	170	0	672	213	2089	651	87	1707	532
V/C Ratio(X)	0.84	0.71	0.35	0.18	0.00	0.26	0.88	0.83	0.10	0.81	0.79	0.28
Avail Cap(c_a), veh/h	427	690	578	170	0	672	250	2089	651	101	1707	532
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.55	0.55	0.55	0.79	0.79	0.79
Uniform Delay (d), s/veh	40.5	31.4	26.3	45.0	0.0	25.3	56.4	47.3	31.5	52.9	15.4	12.6
Incr Delay (d2), s/veh	13.5	3.4	0.4	0.5	0.0	0.2	14.1	2.2	0.2	24.6	3.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.3	14.4	4.8	0.9	0.0	3.9	7.0	19.2	1.9	2.9	10.2	2.0
LnGrp Delay(d),s/veh	54.0	34.7	26.7	45.5	0.0	25.5	70.5	49.6	31.7	77.6	18.4	13.7
LnGrp LOS	D	C	C	D		C	E	D	C	E	B	B
Approach Vol, veh/h		1048			204			1982			1572	
Approach Delay, s/veh		39.8			28.6			51.0			20.7	
Approach LOS		D			C			D			C	

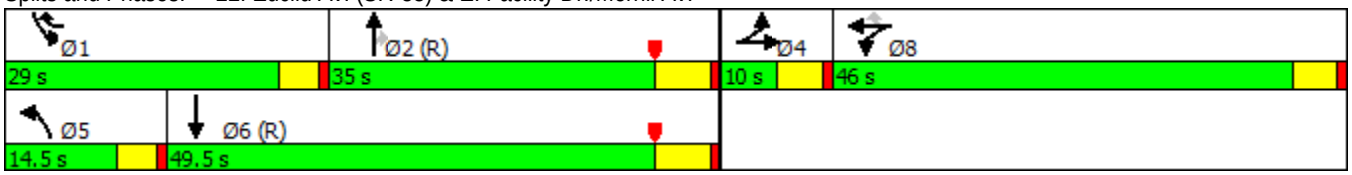
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	57.0		53.0	19.3	47.7		53.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	50.0		46.0	18.5	39.0		46.0
Max Q Clear Time (g_c+I1), s	7.1	43.1		46.5	15.8	24.4		34.2
Green Ext Time (p_c), s	0.0	6.5		0.0	0.1	13.2		4.9

Intersection Summary	
HCM 2010 Ctrl Delay	37.7
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	21	0	457	2	1594	350	690	1123
Future Volume (vph)	21	0	457	2	1594	350	690	1123
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	29.0	14.5	35.0	35.0	29.0	49.5
Total Split (%)	8.3%	38.3%	24.2%	12.1%	29.2%	29.2%	24.2%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	22.2	62.7	10.0	38.8	38.8	35.6	75.9
Actuated g/C Ratio	0.04	0.18	0.52	0.08	0.32	0.32	0.30	0.63
v/c Ratio	0.48	0.62	0.57	0.01	1.05	0.64	0.77	0.39
Control Delay	62.1	52.2	15.9	64.5	66.3	19.9	40.6	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	52.2	15.9	64.5	66.3	19.9	40.6	4.8
LOS	E	D	B	E	E	B	D	A
Approach Delay	62.1	26.3			58.0			18.4
Approach LOS	E	C			E			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 86.5 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 37.3	Intersection LOS: D
Intersection Capacity Utilization 85.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	21	11	182	0	457	2	1594	350	690	1123	1
Future Volume (veh/h)	5	21	11	182	0	457	2	1594	350	690	1123	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1872	1800	1768	1800	1800
Adj Flow Rate, veh/h	5	23	4	196	0	463	2	1714	347	742	1208	1
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	34	6	445	0	709	9	1729	511	667	2723	2
Arrive On Green	0.03	0.03	0.03	0.26	0.00	0.26	0.01	0.34	0.34	0.20	0.54	0.54
Sat Flow, veh/h	273	1256	218	1714	0	1530	1619	5111	1510	3267	5071	4
Grp Volume(v), veh/h	32	0	0	196	0	463	2	1714	347	742	780	429
Grp Sat Flow(s),veh/h/ln	1748	0	0	1714	0	1530	1619	1704	1510	1633	1638	1799
Q Serve(g_s), s	2.2	0.0	0.0	11.5	0.0	27.9	0.1	40.1	23.7	24.5	17.4	17.4
Cycle Q Clear(g_c), s	2.2	0.0	0.0	11.5	0.0	27.9	0.1	40.1	23.7	24.5	17.4	17.4
Prop In Lane	0.16		0.12	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	48	0	0	445	0	709	9	1729	511	667	1759	966
V/C Ratio(X)	0.67	0.00	0.00	0.44	0.00	0.65	0.23	0.99	0.68	1.11	0.44	0.44
Avail Cap(c_a), veh/h	73	0	0	586	0	835	135	1729	511	667	1759	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.8	0.0	0.0	37.2	0.0	24.8	59.4	39.5	34.1	47.8	16.9	16.9
Incr Delay (d2), s/veh	5.9	0.0	0.0	0.3	0.0	0.9	3.0	15.1	4.4	70.0	0.8	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	5.5	0.0	11.9	0.1	21.3	10.5	17.5	8.0	9.0
LnGrp Delay(d),s/veh	63.7	0.0	0.0	37.4	0.0	25.6	62.4	54.6	38.6	117.7	17.7	18.4
LnGrp LOS	E			D		C	E	D	D	F	B	B
Approach Vol, veh/h		32			659			2063			1951	
Approach Delay, s/veh		63.7			29.1			51.9			55.9	
Approach LOS		E			C			D			E	

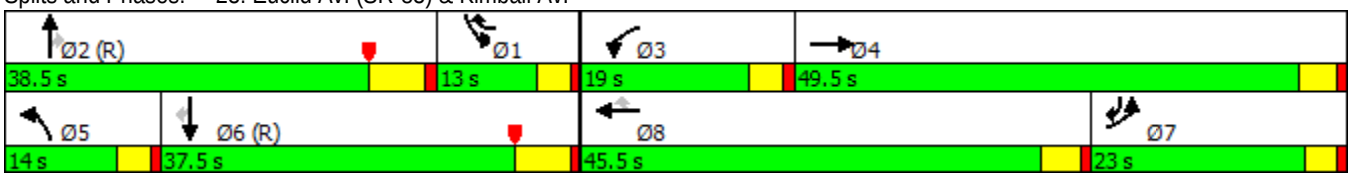
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	46.6		8.3	5.1	70.4		36.1
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	24.5	29.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	26.5	42.1		4.2	2.1	19.4		29.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	20.3		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	50.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	629	822	231	440	441	125	822	160	284	884	201
Future Volume (vph)	629	822	231	440	441	125	822	160	284	884	201
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	1	5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	9.0	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	23.0	49.5	19.0	45.5	13.0	14.0	38.5	38.5	13.0	37.5	23.0
Total Split (%)	19.2%	41.3%	15.8%	37.9%	10.8%	11.7%	32.1%	32.1%	10.8%	31.3%	19.2%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	34.5	43.2	15.0	23.7	42.0	11.8	29.5	29.5	13.8	31.5	68.0
Actuated g/C Ratio	0.29	0.36	0.12	0.20	0.35	0.10	0.25	0.25	0.12	0.26	0.57
v/c Ratio	0.73	0.77	1.20	0.68	0.76	0.82	0.71	0.33	0.82	0.71	0.22
Control Delay	45.3	38.8	172.4	48.9	34.8	95.9	58.2	24.1	65.1	34.2	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	38.8	172.4	48.9	34.8	95.9	58.2	24.1	65.1	34.2	2.3
LOS	D	D	F	D	C	F	E	C	E	C	A
Approach Delay		41.4		69.0			57.5			35.9	
Approach LOS		D		E			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 49.4	Intersection LOS: D
Intersection Capacity Utilization 82.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	629	822	82	231	440	441	125	822	160	284	884	201
Future Volume (veh/h)	629	822	82	231	440	441	125	822	160	284	884	201
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	655	856	81	241	458	425	130	856	152	296	921	191
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	810	956	90	202	566	540	135	1052	327	589	1645	900
Arrive On Green	0.26	0.30	0.30	0.13	0.17	0.17	0.11	0.28	0.28	0.19	0.33	0.33
Sat Flow, veh/h	3141	3158	299	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	655	463	474	241	458	425	130	856	152	296	921	191
Grp Sat Flow(s),veh/h/ln	1570	1710	1747	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	23.5	31.1	31.1	15.0	15.5	7.4	9.6	19.5	7.2	10.1	18.4	2.0
Cycle Q Clear(g_c), s	23.5	31.1	31.1	15.0	15.5	7.4	9.6	19.5	7.2	10.1	18.4	2.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	810	518	529	202	566	540	135	1052	327	589	1645	900
V/C Ratio(X)	0.81	0.90	0.90	1.19	0.81	0.79	0.96	0.81	0.46	0.50	0.56	0.21
Avail Cap(c_a), veh/h	810	641	655	202	1169	810	135	1331	414	589	1645	900
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	0.37	0.37	0.37	1.00	1.00	1.00	0.46	0.46	0.46	0.93	0.93	0.93
Uniform Delay (d), s/veh	41.7	40.0	40.0	52.5	48.2	34.8	53.2	40.7	20.1	43.7	32.7	3.8
Incr Delay (d2), s/veh	2.2	5.5	5.4	124.2	1.1	1.5	42.4	3.3	2.2	0.2	1.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	15.5	15.8	13.7	7.4	3.2	5.9	9.1	3.3	4.4	8.6	1.5
LnGrp Delay(d),s/veh	43.9	45.6	45.5	176.7	49.3	36.3	95.6	44.0	22.3	44.0	34.0	4.3
LnGrp LOS	D	D	D	F	D	D	F	D	C	D	C	A
Approach Vol, veh/h		1592			1124			1138			1408	
Approach Delay, s/veh		44.9			71.7			47.0			32.0	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.5	31.7	19.0	40.8	14.0	46.2	35.5	24.4
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.5	* 4.5
Max Green Setting (Gmax), s	9.0	* 33	15.0	45.0	10.0	31.5	19.0	* 41
Max Q Clear Time (g_c+I1), s	12.1	21.5	17.0	33.1	11.6	20.4	25.5	17.5
Green Ext Time (p_c), s	0.0	4.2	0.0	3.2	0.0	5.0	0.0	2.4

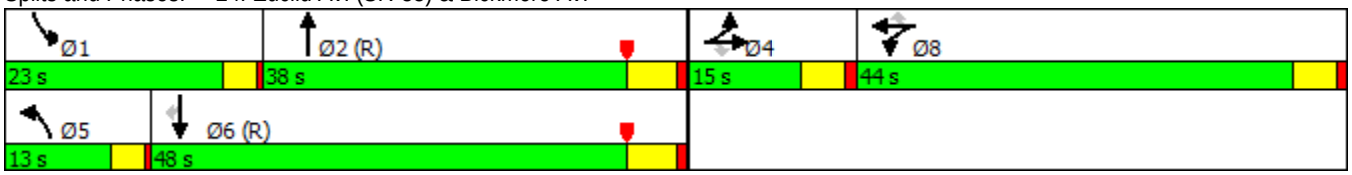
Intersection Summary	
HCM 2010 Ctrl Delay	47.6
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	116	120	119	163	43	124	47	872	219	863	78
Future Volume (vph)	116	120	119	163	43	124	47	872	219	863	78
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	44.0	44.0	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	15.0	15.0	15.0	44.0	44.0	44.0	13.0	38.0	23.0	48.0	48.0
Total Split (%)	12.5%	12.5%	12.5%	36.7%	36.7%	36.7%	10.8%	31.7%	19.2%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	10.0	10.0	17.3	17.3	17.3	7.9	51.3	22.3	67.5	67.5
Actuated g/C Ratio	0.08	0.08	0.08	0.14	0.14	0.14	0.07	0.43	0.19	0.56	0.56
v/c Ratio	0.96	0.89	0.53	0.52	0.48	0.41	0.50	0.85	0.81	0.50	0.10
Control Delay	123.6	103.2	17.1	52.9	51.1	9.3	70.5	36.9	46.5	37.9	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.6	103.2	17.1	52.9	51.1	9.3	70.5	36.9	46.5	37.9	20.0
LOS	F	F	B	D	D	A	E	D	D	D	B
Approach Delay		81.1			35.9			38.3		38.3	
Approach LOS		F			D			D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 43.1	Intersection LOS: D
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	120	119	163	43	124	47	872	223	219	863	78
Future Volume (veh/h)	116	120	119	163	43	124	47	872	223	219	863	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	129	133	113	114	141	126	52	969	238	243	959	87
Adj No. of Lanes	1	1	1	1	1	1	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	150	127	168	186	158	65	1337	327	262	2102	921
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.01	0.16	0.16	0.32	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	1800	1530	1619	2712	664	1619	3420	1498
Grp Volume(v), veh/h	129	133	113	114	141	126	52	610	597	243	959	87
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1619	1710	1666	1619	1710	1498
Q Serve(g_s), s	9.5	8.8	8.8	8.1	9.1	9.7	3.8	40.6	40.8	17.4	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.8	8.8	8.1	9.1	9.7	3.8	40.6	40.8	17.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	135	150	127	168	186	158	65	843	821	262	2102	921
V/C Ratio(X)	0.96	0.89	0.89	0.68	0.76	0.79	0.80	0.72	0.73	0.93	0.46	0.09
Avail Cap(c_a), veh/h	135	150	127	526	585	497	128	843	821	263	2102	921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.47	0.47	0.47
Uniform Delay (d), s/veh	54.8	54.4	54.4	51.9	52.3	52.5	58.7	42.5	42.6	39.9	0.0	0.0
Incr Delay (d2), s/veh	63.4	41.1	45.9	1.8	2.4	3.4	0.8	0.5	0.5	21.6	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	6.1	5.3	3.7	4.7	4.2	1.7	19.4	19.0	9.3	0.1	0.0
LnGrp Delay(d),s/veh	118.2	95.6	100.3	53.7	54.7	55.9	59.5	43.0	43.1	61.6	0.3	0.1
LnGrp LOS	F	F	F	D	D	E	E	D	D	E	A	A
Approach Vol, veh/h		375			381			1259			1289	
Approach Delay, s/veh		104.8			54.8			43.7			11.9	
Approach LOS		F			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.9	64.7		15.0	8.3	79.2		17.4
Change Period (Y+Rc), s	3.5	5.5		5.0	3.5	5.5		5.0
Max Green Setting (Gmax), s	19.5	32.5		10.0	9.5	42.5		39.0
Max Q Clear Time (g_c+I1), s	19.4	42.8		11.5	5.8	2.0		11.7
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	11.3		0.8

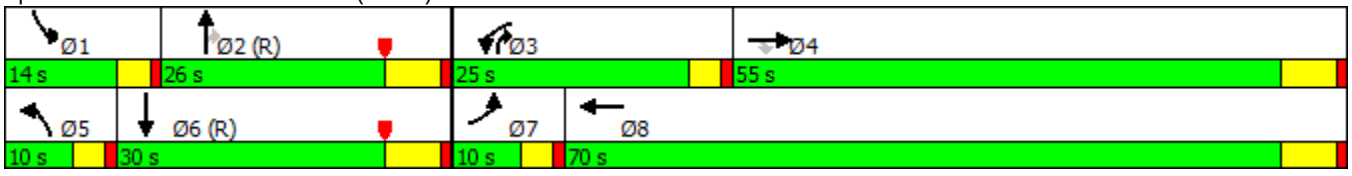
Intersection Summary	
HCM 2010 Ctrl Delay	39.5
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	346	29	484	78	34	1010	1095	127	966
Future Volume (vph)	15	346	29	484	78	34	1010	1095	127	966
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	10.0	55.0	55.0	25.0	70.0	10.0	26.0	25.0	14.0	30.0
Total Split (%)	8.3%	45.8%	45.8%	20.8%	58.3%	8.3%	21.7%	20.8%	11.7%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.5	30.7	30.7	21.0	51.7	7.2	31.7	58.7	16.5	44.8
Actuated g/C Ratio	0.05	0.26	0.26	0.18	0.43	0.06	0.26	0.49	0.14	0.37
v/c Ratio	0.20	0.78	0.06	0.97	0.19	0.36	0.80	1.23	0.59	0.55
Control Delay	61.5	52.7	0.2	81.7	13.5	67.6	38.5	126.0	43.8	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	52.7	0.2	81.7	13.5	67.6	38.5	126.0	43.8	25.6
LOS	E	D	A	F	B	E	D	F	D	C
Approach Delay		49.1			66.3		83.8			27.7
Approach LOS		D			E		F			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 63.4	Intersection LOS: E
Intersection Capacity Utilization 110.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	346	29	484	78	64	34	1010	1095	127	966	15
Future Volume (veh/h)	15	346	29	484	78	64	34	1010	1095	127	966	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	357	0	499	80	60	35	1041	696	131	996	11
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	429	365	517	380	285	46	1654	783	135	1960	22
Arrive On Green	0.02	0.24	0.00	0.17	0.40	0.40	0.03	0.34	0.34	0.06	0.26	0.26
Sat Flow, veh/h	1619	1800	1530	2956	956	717	1619	4914	1530	1619	5009	55
Grp Volume(v), veh/h	15	357	0	499	0	140	35	1041	696	131	651	356
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1673	1619	1638	1530	1619	1638	1789
Q Serve(g_s), s	1.1	22.6	0.0	20.1	0.0	6.6	2.6	21.4	40.4	9.7	20.3	20.3
Cycle Q Clear(g_c), s	1.1	22.6	0.0	20.1	0.0	6.6	2.6	21.4	40.4	9.7	20.3	20.3
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	27	429	365	517	0	664	46	1654	783	135	1282	700
V/C Ratio(X)	0.57	0.83	0.00	0.96	0.00	0.21	0.75	0.63	0.89	0.97	0.51	0.51
Avail Cap(c_a), veh/h	81	735	625	517	0	893	81	1654	783	135	1282	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.85	0.85	0.85
Uniform Delay (d), s/veh	58.6	43.4	0.0	49.1	0.0	23.8	57.9	33.5	26.3	56.5	34.4	34.4
Incr Delay (d2), s/veh	6.8	5.9	0.0	30.4	0.0	0.2	0.8	0.2	1.6	62.5	1.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.9	0.0	10.4	0.0	3.1	1.2	9.7	21.0	6.7	9.4	10.5
LnGrp Delay(d),s/veh	65.4	49.4	0.0	79.6	0.0	24.0	58.7	33.7	27.9	119.0	35.7	36.7
LnGrp LOS	E	D		E		C	E	C	C	F	D	D
Approach Vol, veh/h		372			639			1772			1138	
Approach Delay, s/veh		50.0			67.4			31.9			45.6	
Approach LOS		D			E			C			D	

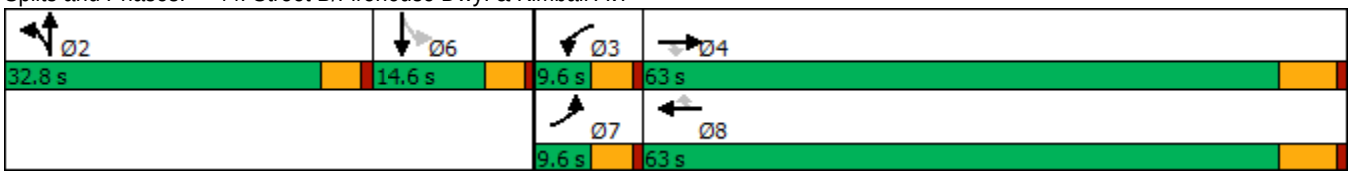
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	46.4	25.0	34.6	7.4	53.0	6.0	53.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	20.0	21.0	49.0	6.0	24.0	6.0	64.0
Max Q Clear Time (g_c+I1), s	11.7	42.4	22.1	24.6	4.6	22.3	3.1	8.6
Green Ext Time (p_c), s	0.0	0.0	0.0	4.0	0.0	1.4	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	43.4
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	1216	23	8	885	0		
Future Volume (vph)	1216	23	8	885	0		
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		3	8	2	6	7
Permitted Phases		4					
Detector Phase	4	4	3	8	2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	23.2	23.2	9.6	16.2	31.6	14.6	9.6
Total Split (s)	63.0	63.0	9.6	63.0	32.8	14.6	9.6
Total Split (%)	52.5%	52.5%	8.0%	52.5%	27.3%	12%	8%
Yellow Time (s)	5.2	5.2	3.6	5.2	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.2	6.2	4.6	6.2	4.6		
Lead/Lag	Lag	Lag	Lead	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	Min	Min	None
Act Effct Green (s)	34.6	34.6	5.3	35.8	12.8		
Actuated g/C Ratio	0.46	0.46	0.07	0.47	0.17		
v/c Ratio	0.78	0.03	0.07	0.58	0.35		
Control Delay	21.5	0.0	44.1	15.5	12.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	21.5	0.0	44.1	15.5	12.5		
LOS	C	A	D	B	B		
Approach Delay	21.1			15.8	12.5		
Approach LOS	C			B	B		

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 75.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1216	23	8	885	0	96	0	35	0	0	0
Future Volume (veh/h)	0	1216	23	8	885	0	96	0	35	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	1280	24	8	932	0	101	0	37	0	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	1846	785	17	2085	933	228	0	84	0	3	0
Arrive On Green	0.00	0.51	0.51	0.01	0.61	0.00	0.19	0.00	0.19	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	3420	1530	1215	0	445	0	1800	0
Grp Volume(v), veh/h	0	1280	24	8	932	0	138	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1710	1530	1661	0	0	0	1800	0
Q Serve(g_s), s	0.0	14.3	0.4	0.3	7.8	0.0	3.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	14.3	0.4	0.3	7.8	0.0	3.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.73		0.27	0.00		0.00
Lane Grp Cap(c), veh/h	3	1846	785	17	2085	933	312	0	0	0	3	0
V/C Ratio(X)	0.00	0.69	0.03	0.47	0.45	0.00	0.44	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	152	3838	1631	152	3646	1631	879	0	0	0	338	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.8	6.4	26.2	5.6	0.0	19.2	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	7.4	0.2	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.1	0.2	0.2	3.7	0.0	1.9	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	10.3	6.4	33.6	5.7	0.0	20.2	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		B	A	C	A		C					
Approach Vol, veh/h		1304			940			138			0	
Approach Delay, s/veh		10.2			6.0			20.2			0.0	
Approach LOS		B			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.6	5.2	33.5		0.0	0.0	38.7
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		28.2	5.0	56.8		10.0	5.0	56.8
Max Q Clear Time (g_c+I1), s		5.9	2.3	16.3		0.0	0.0	9.8
Green Ext Time (p_c), s		0.8	0.0	11.0		0.0	0.0	6.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.1
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	289	688	14	417	25	6	75	18
Future Volume (vph)	289	688	14	417	25	6	75	18
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	37.4	9.6	24.0	33.0	33.0	33.0	33.0
Total Split (%)	28.8%	46.8%	12.0%	30.0%	41.3%	41.3%	41.3%	41.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	16.7	35.6	5.1	16.0		26.5		26.5
Actuated g/C Ratio	0.22	0.48	0.07	0.21		0.35		0.35
v/c Ratio	0.85	0.49	0.14	0.76		0.10		0.90
Control Delay	52.3	15.5	38.5	35.9		18.0		47.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	52.3	15.5	38.5	35.9		18.0		47.2
LOS	D	B	D	D		B		D
Approach Delay		25.9		36.0		18.0		47.2
Approach LOS		C		D		B		D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 74.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 74.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	289	688	46	14	417	89	25	6	10	75	18	352
Future Volume (veh/h)	289	688	46	14	417	89	25	6	10	75	18	352
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	307	732	49	15	444	95	27	6	11	80	19	374
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	346	1354	91	29	621	132	232	56	69	126	43	414
Arrive On Green	0.21	0.42	0.42	0.02	0.22	0.22	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1619	3247	217	1619	2808	597	432	162	198	193	123	1192
Grp Volume(v), veh/h	307	385	396	15	269	270	44	0	0	473	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1754	1619	1710	1695	793	0	0	1508	0	0
Q Serve(g_s), s	13.0	12.0	12.0	0.7	10.3	10.4	0.0	0.0	0.0	15.2	0.0	0.0
Cycle Q Clear(g_c), s	13.0	12.0	12.0	0.7	10.3	10.4	1.2	0.0	0.0	21.1	0.0	0.0
Prop In Lane	1.00		0.12	1.00		0.35	0.61		0.25	0.17		0.79
Lane Grp Cap(c), veh/h	346	713	731	29	378	375	358	0	0	583	0	0
V/C Ratio(X)	0.89	0.54	0.54	0.51	0.71	0.72	0.12	0.00	0.00	0.81	0.00	0.00
Avail Cap(c_a), veh/h	421	753	773	114	430	426	421	0	0	663	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	27.0	15.5	15.5	34.5	25.5	25.5	15.5	0.0	0.0	21.9	0.0	0.0
Incr Delay (d2), s/veh	15.6	0.7	0.7	5.1	4.7	5.1	0.2	0.0	0.0	6.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	5.8	6.0	0.3	5.4	5.4	0.6	0.0	0.0	9.8	0.0	0.0
LnGrp Delay(d),s/veh	42.6	16.2	16.2	39.6	30.2	30.6	15.6	0.0	0.0	28.6	0.0	0.0
LnGrp LOS	D	B	B	D	C	C	B			C		
Approach Vol, veh/h		1088			554			44			473	
Approach Delay, s/veh		23.7			30.6			15.6			28.6	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	35.7		29.2	19.7	21.9		29.2
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	31.2		28.4	18.4	17.8		28.4
Max Q Clear Time (g_c+I1), s	2.7	14.0		23.1	15.0	12.4		3.2
Green Ext Time (p_c), s	0.0	6.8		1.5	0.2	3.2		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	26.4
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	345	380	195	156	328	202
Future Volume (vph)	345	380	195	156	328	202
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	14.0	46.8	32.8	32.8
Total Split (%)	41.5%	41.5%	17.5%	58.5%	41.0%	41.0%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	18.8	17.1	9.8	32.2	17.7	17.7
Actuated g/C Ratio	0.30	0.28	0.16	0.52	0.29	0.29
v/c Ratio	0.76	0.58	0.83	0.18	0.69	0.37
Control Delay	31.0	5.9	58.8	9.5	27.8	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	5.9	58.8	9.5	27.8	5.1
LOS	C	A	E	A	C	A
Approach Delay				36.9	19.2	
Approach LOS				D	B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 61.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	345	0	380	0	0	0	195	156	0	0	328	202
Future Volume (veh/h)	345	0	380	0	0	0	195	156	0	0	328	202
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	371	0	409				210	168	0	0	353	217
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	498	0	471				252	913	0	0	486	403
Arrive On Green	0.31	0.00	0.31				0.16	0.51	0.00	0.00	0.27	0.27
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1493
Grp Volume(v), veh/h	371	0	409				210	168	0	0	353	217
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1493
Q Serve(g_s), s	11.6	0.0	14.2				7.1	2.8	0.0	0.0	10.0	7.0
Cycle Q Clear(g_c), s	11.6	0.0	14.2				7.1	2.8	0.0	0.0	10.0	7.0
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	498	0	471				252	913	0	0	486	403
V/C Ratio(X)	0.74	0.00	0.87				0.83	0.18	0.00	0.00	0.73	0.54
Avail Cap(c_a), veh/h	824	0	779				271	1314	0	0	865	718
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	17.5	0.0	18.4				23.0	7.5	0.0	0.0	18.6	17.5
Incr Delay (d2), s/veh	0.8	0.0	3.0				17.1	0.1	0.0	0.0	2.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	11.2				4.3	1.4	0.0	0.0	5.2	6.0
LnGrp Delay(d),s/veh	18.3	0.0	21.4				40.1	7.6	0.0	0.0	20.7	18.6
LnGrp LOS	B		C				D	A			C	B
Approach Vol, veh/h		780						378			570	
Approach Delay, s/veh		19.9						25.7			19.9	
Approach LOS		B						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		34.3		21.9	13.3	21.0		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		41.0		28.6	9.4	27.0		
Max Q Clear Time (g_c+I1), s		4.8		16.2	9.1	12.0		
Green Ext Time (p_c), s		3.8		1.1	0.0	3.1		

Intersection Summary	
HCM 2010 Ctrl Delay	21.2
HCM 2010 LOS	C

APPENDIX 7.13:

OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	424	420	373	494	1056	1133	526
v/c Ratio	0.94	0.92	0.76	0.92	0.52	0.90	0.60
Control Delay	63.1	58.1	32.5	51.1	17.6	38.2	5.2
Queue Delay	1.4	1.0	0.0	0.0	1.1	0.0	0.0
Total Delay	64.5	59.1	32.5	51.1	18.7	38.2	5.2
Queue Length 50th (ft)	244	247	150	155	265	318	0
Queue Length 95th (ft)	#432	#441	#291	#247	332	#451	68
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	460	467	502	539	2018	1262	879
Starvation Cap Reductn	0	0	0	0	670	0	0
Spillback Cap Reductn	6	6	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.91	0.74	0.92	0.78	0.90	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	329	344	347	1167	690	324	1588
v/c Ratio	0.85	0.82	0.81	0.75	0.65	0.80	0.74
Control Delay	51.6	41.1	39.4	25.2	4.8	45.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	51.6	41.1	39.4	25.2	4.8	45.0	5.9
Queue Length 50th (ft)	180	151	146	301	0	80	274
Queue Length 95th (ft)	#307	#292	#266	388	68	m95	m342
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900		500				
Base Capacity (vph)	443	463	476	1554	1059	423	2151
Starvation Cap Reductn	0	0	0	0	0	0	280
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.74	0.73	0.75	0.65	0.77	0.85

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	391	382	351	556	1131	996	578
v/c Ratio	0.94	0.91	0.78	0.87	0.54	0.81	0.64
Control Delay	66.3	57.1	36.0	41.1	18.3	33.3	5.7
Queue Delay	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Total Delay	66.3	57.1	36.0	41.1	20.0	33.3	5.7
Queue Length 50th (ft)	226	217	146	169	280	274	0
Queue Length 95th (ft)	#407	#401	#287	m#234	354	#385	77
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	426	434	461	678	2098	1226	905
Starvation Cap Reductn	0	0	0	0	739	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.88	0.76	0.82	0.83	0.81	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	336	319	310	1236	773	319	1299
v/c Ratio	0.89	0.80	0.74	0.77	0.70	0.83	0.60
Control Delay	58.8	41.1	34.5	24.5	5.6	49.3	2.6
Queue Delay	3.0	1.2	0.0	0.0	0.0	0.0	0.4
Total Delay	61.8	42.3	34.5	24.5	5.6	49.3	3.0
Queue Length 50th (ft)	188	147	124	308	7	79	11
Queue Length 95th (ft)	#338	#285	225	396	86	m102	m11
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900		500				
Base Capacity (vph)	409	427	445	1603	1100	393	2177
Starvation Cap Reductn	0	0	0	0	0	0	396
Spillback Cap Reductn	26	24	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.79	0.70	0.77	0.70	0.81	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 7.14:

OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	453	446	373	502	1058	1142	526
v/c Ratio	0.98	0.95	0.74	0.93	0.53	0.92	0.60
Control Delay	71.8	63.9	31.5	51.6	17.9	41.5	5.3
Queue Delay	4.1	2.7	0.0	0.0	1.3	0.0	0.0
Total Delay	75.8	66.6	31.5	51.6	19.1	41.5	5.3
Queue Length 50th (ft)	268	269	150	158	265	322	0
Queue Length 95th (ft)	#473	#480	#291	m#252	333	#457	68
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	460	468	502	539	1995	1235	871
Starvation Cap Reductn	0	0	0	0	666	0	0
Spillback Cap Reductn	8	8	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.97	0.74	0.93	0.80	0.92	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	329	372	363	1177	701	324	1651
v/c Ratio	0.84	0.89	0.84	0.76	0.66	0.80	0.77
Control Delay	50.6	48.8	42.7	25.5	4.9	45.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Total Delay	50.6	48.8	42.7	25.5	4.9	45.2	6.4
Queue Length 50th (ft)	177	171	155	305	0	83	301
Queue Length 95th (ft)	#307	#336	#300	394	68	m91	m294
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900		500				
Base Capacity (vph)	443	463	476	1552	1064	418	2145
Starvation Cap Reductn	0	0	0	0	0	0	270
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.80	0.76	0.76	0.66	0.78	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	392	390	355	600	1139	998	578
v/c Ratio	0.95	0.92	0.79	0.91	0.54	0.83	0.64
Control Delay	66.6	60.4	37.0	43.5	18.6	34.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	1.7	0.0	0.0
Total Delay	66.6	60.4	37.0	43.5	20.4	34.4	5.8
Queue Length 50th (ft)	227	225	149	185	285	275	0
Queue Length 95th (ft)	#408	#414	#294	m#254	361	#386	77
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	426	434	460	678	2098	1205	899
Starvation Cap Reductn	0	0	0	0	744	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.90	0.77	0.88	0.84	0.83	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	340	320	315	1287	828	319	1314
v/c Ratio	0.89	0.80	0.75	0.80	0.75	0.83	0.60
Control Delay	59.3	41.5	35.1	25.9	7.6	49.6	2.5
Queue Delay	4.4	1.7	0.0	0.0	0.0	0.0	0.5
Total Delay	63.7	43.1	35.1	25.9	7.6	49.6	3.0
Queue Length 50th (ft)	191	149	127	327	25	79	11
Queue Length 95th (ft)	#345	#289	#234	421	149	m101	m12
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900		500				
Base Capacity (vph)	409	425	445	1600	1099	390	2172
Starvation Cap Reductn	0	0	0	0	0	0	390
Spillback Cap Reductn	31	29	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.81	0.71	0.80	0.75	0.82	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 8.1:

OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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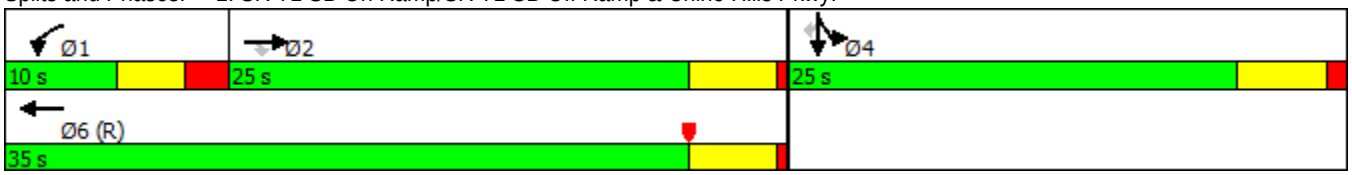
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1267	330	6	1002	530	88	415
Future Volume (vph)	1267	330	6	1002	530	88	415
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.44	0.38	0.04	0.59	0.62	0.58	0.73
Control Delay	11.8	3.2	27.7	9.7	23.2	21.7	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	3.2	27.7	9.7	23.2	21.7	21.6
LOS	B	A	C	A	C	C	C
Approach Delay	10.0			9.8		22.1	
Approach LOS	B			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1267	330	6	1002	0	0	0	0	530	88	415
Future Volume (veh/h)	0	1267	330	6	1002	0	0	0	0	530	88	415
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1306	270	6	1033	0				611	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1306	270	6	1033	0				611	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	9.3	7.5	0.2	9.8	0.0				9.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.3	7.5	0.2	9.8	0.0				9.3	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.51	0.42	0.47	0.59	0.00				0.57	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.71	0.71	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.9	12.4	29.6	6.4	0.0				16.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.4	6.8	1.1	0.0				2.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.0	3.2	0.1	4.7	0.0				4.5	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.1	12.8	36.4	7.4	0.0				18.6	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1576			1039						611	
Approach Delay, s/veh		13.0			7.6						18.6	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	11.3		11.3		11.8		
Green Ext Time (p_c), s	0.0	8.0		1.2		15.0		

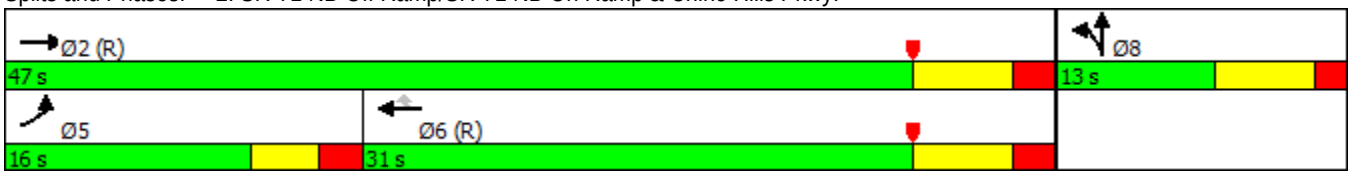
Intersection Summary	
HCM 2010 Ctrl Delay	12.3
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	581	1216	617	351	391	208
Future Volume (vph)	581	1216	617	351	391	208
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	47.0	31.0	31.0	13.0	13.0
Total Split (%)	26.7%	78.3%	51.7%	51.7%	21.7%	21.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	40.5	24.5	24.5	7.0	7.0
Actuated g/C Ratio	0.18	0.68	0.41	0.41	0.12	0.12
v/c Ratio	1.13	0.55	0.46	0.53	1.23	1.15
Control Delay	108.2	6.1	14.3	11.1	173.0	122.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.2	6.1	14.3	11.1	173.0	122.8
LOS	F	A	B	B	F	F
Approach Delay		39.1	13.2			139.3
Approach LOS		D	B			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 49.7	Intersection LOS: D
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	581	1216	0	0	617	351	391	208	9	0	0	0
Future Volume (veh/h)	581	1216	0	0	617	351	391	208	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	612	1280	0	0	649	368	428	197	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	542	2308	0	0	1396	615	378	203	6			
Arrive On Green	0.18	0.68	0.00	0.00	0.41	0.41	0.12	0.12	0.12			
Sat Flow, veh/h	2956	3510	0	0	3510	1506	3238	1738	53			
Grp Volume(v), veh/h	612	1280	0	0	649	368	428	0	203			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1506	1619	0	1791			
Q Serve(g_s), s	11.0	11.7	0.0	0.0	8.3	11.5	7.0	0.0	6.8			
Cycle Q Clear(g_c), s	11.0	11.7	0.0	0.0	8.3	11.5	7.0	0.0	6.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	542	2309	0	0	1397	615	378	0	209			
V/C Ratio(X)	1.13	0.55	0.00	0.00	0.46	0.60	1.13	0.00	0.97			
Avail Cap(c_a), veh/h	542	2309	0	0	1397	615	378	0	209			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.64	0.64	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.5	5.1	0.0	0.0	13.0	13.9	26.5	0.0	26.4			
Incr Delay (d2), s/veh	77.2	0.8	0.0	0.0	0.7	2.7	87.6	0.0	55.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	10.3	5.6	0.0	0.0	4.0	5.2	7.7	0.0	6.5			
LnGrp Delay(d),s/veh	101.7	5.9	0.0	0.0	13.7	16.6	114.1	0.0	81.7			
LnGrp LOS	F	A			B	B	F		F			
Approach Vol, veh/h		1892			1017			631				
Approach Delay, s/veh		36.9			14.7			103.7				
Approach LOS		D			B			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.0			16.0	31.0		13.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		40.5			11.0	24.5		7.0
Max Q Clear Time (g_c+I1), s		13.7			13.0	13.5		9.0
Green Ext Time (p_c), s		17.6			0.0	8.8		0.0

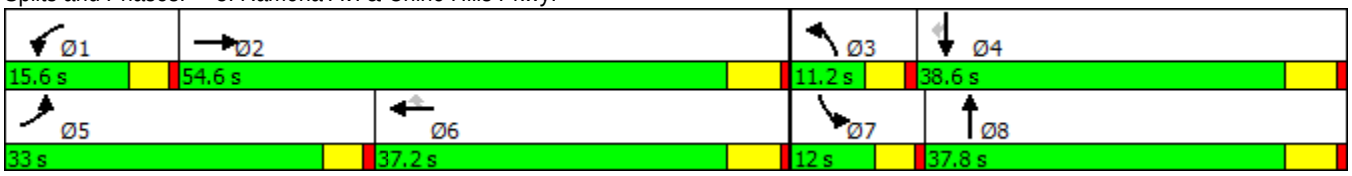
Intersection Summary	
HCM 2010 Ctrl Delay	42.4
HCM 2010 LOS	D

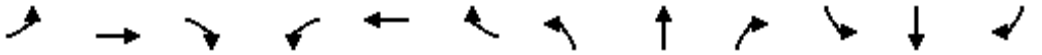
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	368	853	70	680	100	28	415	87	188	260
Future Volume (vph)	368	853	70	680	100	28	415	87	188	260
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	28.4	51.0	9.0	29.5	29.5	6.0	32.0	7.4	37.4	37.4
Actuated g/C Ratio	0.24	0.43	0.08	0.25	0.25	0.05	0.27	0.06	0.32	0.32
v/c Ratio	1.00	0.43	0.60	0.84	0.21	0.35	0.66	0.91	0.18	0.41
Control Delay	90.8	24.9	73.1	51.9	2.7	66.8	39.5	124.9	31.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.8	24.9	73.1	51.9	2.7	66.8	39.5	124.9	31.8	6.0
LOS	F	C	E	D	A	E	D	F	C	A
Approach Delay		44.6		47.9			40.8		34.5	
Approach LOS		D		D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.2	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 43.1	Intersection LOS: D
Intersection Capacity Utilization 92.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	368	853	4	70	680	100	28	415	156	87	188	260
Future Volume (veh/h)	368	853	4	70	680	100	28	415	156	87	188	260
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	387	898	3	74	716	88	29	437	96	92	198	178
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	392	2172	7	92	835	368	42	760	166	102	1060	466
Arrive On Green	0.24	0.43	0.43	0.06	0.24	0.24	0.03	0.27	0.27	0.06	0.31	0.31
Sat Flow, veh/h	1619	5056	17	1619	3420	1507	1619	2785	607	1619	3420	1504
Grp Volume(v), veh/h	387	582	319	74	716	88	29	267	266	92	198	178
Grp Sat Flow(s),veh/h/ln	1619	1638	1797	1619	1710	1507	1619	1710	1682	1619	1710	1504
Q Serve(g_s), s	27.9	14.4	14.4	5.3	23.5	5.5	2.1	15.8	16.0	6.6	5.0	10.9
Cycle Q Clear(g_c), s	27.9	14.4	14.4	5.3	23.5	5.5	2.1	15.8	16.0	6.6	5.0	10.9
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	392	1407	772	92	835	368	42	467	459	102	1060	466
V/C Ratio(X)	0.99	0.41	0.41	0.80	0.86	0.24	0.69	0.57	0.58	0.90	0.19	0.38
Avail Cap(c_a), veh/h	392	1407	772	152	916	404	91	467	459	102	1060	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	23.2	23.2	54.6	42.4	35.6	56.6	36.7	36.8	54.5	29.6	31.6
Incr Delay (d2), s/veh	41.6	0.3	0.5	6.1	8.0	0.5	7.2	5.0	5.3	57.1	0.4	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.0	6.6	7.3	2.5	12.0	2.3	1.0	8.1	8.1	4.6	2.4	4.8
LnGrp Delay(d),s/veh	85.9	23.5	23.7	60.7	50.4	36.0	63.8	41.7	42.1	111.6	30.0	34.0
LnGrp LOS	F	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1288			878			562			468	
Approach Delay, s/veh		42.3			49.8			43.0			47.6	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	56.2	7.7	42.1	33.0	34.4	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	7.3	16.4	4.1	12.9	29.9	25.5	8.6	18.0
Green Ext Time (p_c), s	0.0	18.3	0.0	4.6	0.0	3.2	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	45.3
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	870	101	29	724	113	33
Future Vol, veh/h	870	101	29	724	113	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	956	111	32	796	124	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	956	0	1418	478
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	462	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	727	-	130	539
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	607	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	727	-	~ 124	539
Mov Cap-2 Maneuver	-	-	-	-	295	-
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	580	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	25.9
HCM LOS			D

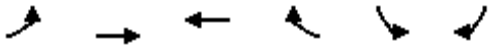
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	329	-	-	727	-
HCM Lane V/C Ratio	0.488	-	-	0.044	-
HCM Control Delay (s)	25.9	-	-	10.2	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.5	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	229	674	651	69	102
Future Volume (vph)	229	674	651	69	102
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	90.0	48.0	30.0	42.0
Total Split (%)	35.0%	75.0%	40.0%	25.0%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	18.2	49.5	26.6	24.7	44.2
Actuated g/C Ratio	0.21	0.57	0.31	0.29	0.51
v/c Ratio	0.73	0.37	0.71	0.09	0.14
Control Delay	45.6	9.9	30.5	27.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	9.9	30.5	27.4	4.7
LOS	D	A	C	C	A
Approach Delay		19.0	30.5	13.8	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 86.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 22.9	Intersection LOS: C
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	229	674	651	32	69	102
Future Volume (veh/h)	229	674	651	32	69	102
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	249	733	708	35	75	36
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	285	2003	1183	58	828	698
Arrive On Green	0.18	0.59	0.36	0.36	0.28	0.28
Sat Flow, veh/h	1619	3510	3407	164	2956	1530
Grp Volume(v), veh/h	249	733	365	378	75	36
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1771	1478	1530
Q Serve(g_s), s	12.9	9.8	15.1	15.1	1.6	1.1
Cycle Q Clear(g_c), s	12.9	9.8	15.1	15.1	1.6	1.1
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	285	2003	610	632	828	698
V/C Ratio(X)	0.87	0.37	0.60	0.60	0.09	0.05
Avail Cap(c_a), veh/h	701	3332	835	865	828	698
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	9.4	22.7	22.7	23.0	13.1
Incr Delay (d2), s/veh	3.3	0.2	1.3	1.3	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	4.6	7.3	7.6	0.7	1.4
LnGrp Delay(d),s/veh	38.0	9.6	24.1	24.0	23.2	13.2
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		982	743		111	
Approach Delay, s/veh		16.8	24.1		20.0	
Approach LOS		B	C		B	

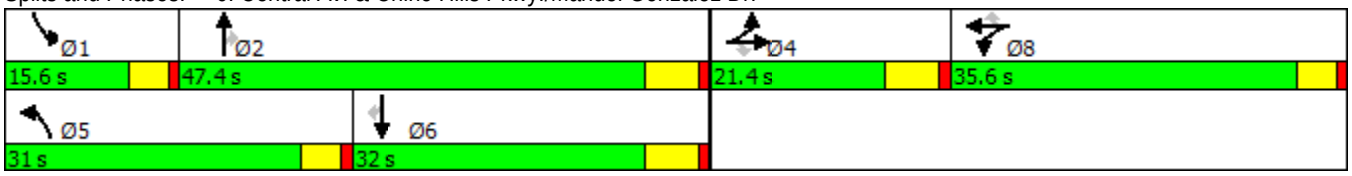
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		56.4		30.0	19.8	36.6		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		84.2		24.2	37.4	42.2		
Max Q Clear Time (g_c+I1), s		11.8		3.6	14.9	17.1		
Green Ext Time (p_c), s		20.5		0.3	0.3	13.7		

Intersection Summary	
HCM 2010 Ctrl Delay	19.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	54	265	2	3	8	382	861	47	67	708	265
Future Volume (vph)	319	54	265	2	3	8	382	861	47	67	708	265
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	15.9	13.5	13.5	13.5	26.9	47.6	47.6	8.2	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.78	0.74	0.58	0.01	0.01	0.03	0.90	0.54	0.06	0.52	0.80	0.51
Control Delay	61.7	56.9	10.5	35.5	35.3	0.1	59.2	21.5	0.1	57.9	40.5	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	56.9	10.5	35.5	35.3	0.1	59.2	21.5	0.1	57.9	40.5	15.3
LOS	E	E	B	D	D	A	E	C	A	E	D	B
Approach Delay		39.0			12.7			31.9			35.2	
Approach LOS		D			B			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 75.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	319	54	265	2	3	8	382	861	47	67	708	265
Future Volume (veh/h)	319	54	265	2	3	8	382	861	47	67	708	265
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	389	0	192	2	3	4	415	936	39	73	770	233
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	496	0	234	36	41	34	446	1796	787	91	1046	462
Arrive On Green	0.15	0.00	0.15	0.02	0.02	0.02	0.28	0.53	0.53	0.06	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	389	0	192	2	3	4	415	936	39	73	770	233
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	9.9	0.0	10.4	0.1	0.1	0.2	21.4	15.3	1.1	3.8	17.3	10.8
Cycle Q Clear(g_c), s	9.9	0.0	10.4	0.1	0.1	0.2	21.4	15.3	1.1	3.8	17.3	10.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	496	0	234	36	41	34	446	1796	787	91	1046	462
V/C Ratio(X)	0.78	0.00	0.82	0.05	0.07	0.12	0.93	0.52	0.05	0.80	0.74	0.50
Avail Cap(c_a), veh/h	590	0	279	586	651	554	499	1796	787	208	1046	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	0.0	35.1	41.0	41.0	41.0	30.2	13.3	9.9	40.0	26.6	24.4
Incr Delay (d2), s/veh	5.8	0.0	15.0	0.6	0.8	1.5	21.8	1.1	0.1	6.0	4.6	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	5.4	0.1	0.1	0.1	12.3	7.4	0.5	1.9	8.8	5.0
LnGrp Delay(d),s/veh	40.7	0.0	50.2	41.6	41.8	42.5	52.0	14.4	10.0	46.0	31.3	28.3
LnGrp LOS	D		D	D	D	D	D	B	B	D	C	C
Approach Vol, veh/h		581			9			1390			1076	
Approach Delay, s/veh		43.8			42.1			25.5			31.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.4	50.8		18.9	28.2	32.0		6.5
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.8	17.3		12.4	23.4	19.3		2.2
Green Ext Time (p_c), s	0.0	17.5		0.7	0.2	6.0		0.0

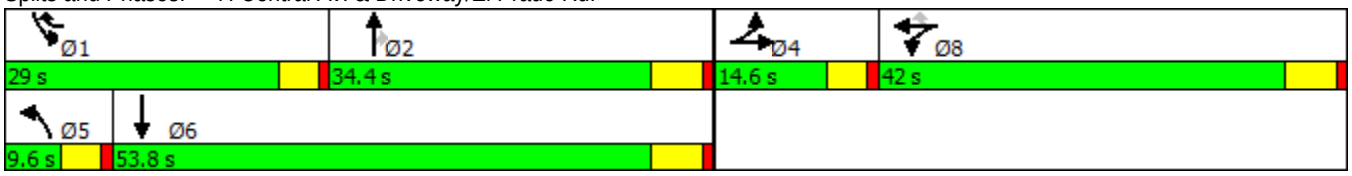
Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C

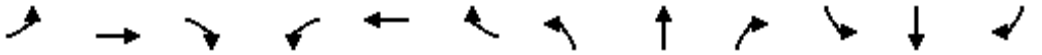
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1067	3	519	2	798	709	406	652
Future Volume (vph)	1	1	1067	3	519	2	798	709	406	652
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	1.16	1.09	0.55	0.03	0.98	0.84	1.24	0.29
Control Delay	48.0	41.0	124.4	101.6	8.4	53.0	65.7	13.9	165.7	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	124.4	101.6	8.4	53.0	65.7	13.9	165.7	16.4
LOS	D	D	F	F	A	D	E	B	F	B
Approach Delay		43.3		78.8			41.4			73.2
Approach LOS		D		E			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 63.8	Intersection LOS: E
Intersection Capacity Utilization 101.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1067	3	519	2	798	709	406	652	10
Future Volume (veh/h)	1	1	1	1067	3	519	2	798	709	406	652	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1188	0	434	2	887	619	451	724	9
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1057	0	836	4	882	390	356	2378	30
Arrive On Green	0.01	0.01	0.01	0.33	0.00	0.33	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5003	62
Grp Volume(v), veh/h	1	0	2	1188	0	434	2	887	619	451	474	259
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	36.2	0.0	19.9	0.1	28.6	28.6	24.4	9.8	9.9
Cycle Q Clear(g_c), s	0.1	0.0	0.1	36.2	0.0	19.9	0.1	28.6	28.6	24.4	9.8	9.9
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1057	0	836	4	882	390	356	1557	850
V/C Ratio(X)	0.08	0.00	0.15	1.12	0.00	0.52	0.46	1.01	1.59	1.27	0.30	0.30
Avail Cap(c_a), veh/h	146	0	149	1057	0	836	73	882	390	356	1557	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	37.3	0.0	15.9	55.2	41.1	41.1	43.2	17.8	17.8
Incr Delay (d2), s/veh	0.9	0.0	2.0	68.3	0.0	0.6	25.4	31.7	277.0	140.2	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	26.0	0.0	8.5	0.1	17.2	41.8	24.7	4.5	5.0
LnGrp Delay(d),s/veh	55.5	0.0	56.6	105.6	0.0	16.5	80.6	72.8	318.1	183.4	18.4	18.8
LnGrp LOS	E		E	F		B	F	F	F	F	B	B
Approach Vol, veh/h		3			1622			1508			1184	
Approach Delay, s/veh		56.2			81.8			173.5			81.3	
Approach LOS		E			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		42.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	11.9		38.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	24.9		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		113.7
HCM 2010 LOS		F

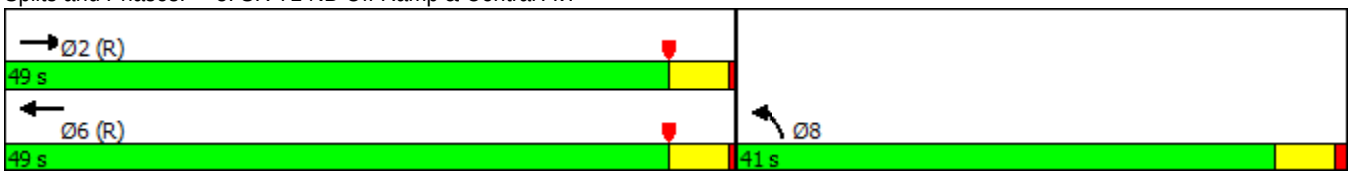
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1217	912	105
Future Volume (vph)	1217	912	105
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	49.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	57.3	57.3	23.2
Actuated g/C Ratio	0.64	0.64	0.26
v/c Ratio	0.91dr	0.35	1.21dr
Control Delay	9.9	8.6	38.1
Queue Delay	0.0	0.0	0.0
Total Delay	9.9	8.6	38.1
LOS	A	A	D
Approach Delay	9.9	8.6	38.1
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1217	826	0	912	105	393
Future Volume (veh/h)	1217	826	0	912	105	393
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1466	995	0	1099	127	280
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2254	1053	0	3381	334	316
Arrive On Green	1.00	1.00	0.00	0.69	0.21	0.21
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1466	995	0	1099	127	280
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	8.1	6.1	16.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	8.1	6.1	16.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2254	1053	0	3381	334	316
V/C Ratio(X)	0.65	0.95	0.00	0.33	0.38	0.89
Avail Cap(c_a), veh/h	2254	1053	0	3381	648	612
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.6	30.7	34.7
Incr Delay (d2), s/veh	1.5	17.3	0.0	0.3	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.1	0.0	3.6	2.7	7.1
LnGrp Delay(d),s/veh	1.5	17.3	0.0	5.9	31.0	38.0
LnGrp LOS	A	B		A	C	D
Approach Vol, veh/h	2461			1099	407	
Approach Delay, s/veh	7.9			5.9	35.8	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		66.4				66.4		23.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		36.0
Max Q Clear Time (g_c+I1), s		2.0				10.1		18.0
Green Ext Time (p_c), s		30.1				25.9		0.6

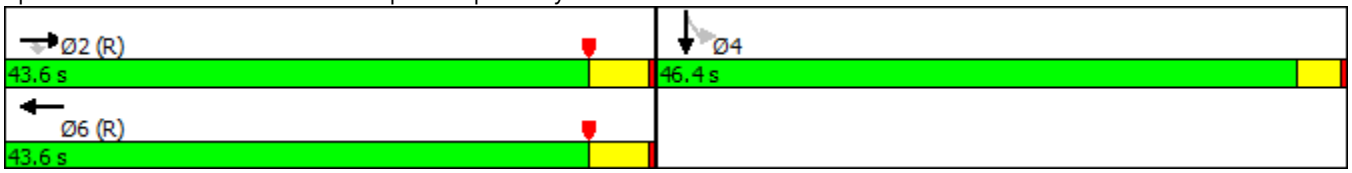
Intersection Summary	
HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1439	75	808	604	0
Future Volume (vph)	1439	75	808	604	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	41.2	41.2	41.2	40.8	40.8
Actuated g/C Ratio	0.46	0.46	0.46	0.45	0.45
v/c Ratio	0.81	0.13	0.58	0.93	0.85
Control Delay	25.2	3.9	13.2	44.2	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	3.9	13.2	44.2	32.8
LOS	C	A	B	D	C
Approach Delay	24.1		13.2		38.7
Approach LOS	C		B		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 25.0	Intersection LOS: C
Intersection Capacity Utilization 66.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1439	75	0	808	208	0	0	0	604	0	372
Future Volume (veh/h)	0	1439	75	0	808	208	0	0	0	604	0	372
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1822	0	0	1023	263				548	304	330
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2439	759	0	1935	497				672	328	356
Arrive On Green	0.00	0.50	0.00	0.00	0.99	0.99				0.41	0.41	0.41
Sat Flow, veh/h	0	5076	1530	0	4060	1001				1619	790	858
Grp Volume(v), veh/h	0	1822	0	0	860	426				548	0	634
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1623				1619	0	1649
Q Serve(g_s), s	0.0	26.7	0.0	0.0	0.4	0.4				26.9	0.0	32.9
Cycle Q Clear(g_c), s	0.0	26.7	0.0	0.0	0.4	0.4				26.9	0.0	32.9
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.52
Lane Grp Cap(c), veh/h	0	2439	759	0	1626	806				672	0	684
V/C Ratio(X)	0.00	0.75	0.00	0.00	0.53	0.53				0.82	0.00	0.93
Avail Cap(c_a), veh/h	0	2439	759	0	1626	806				772	0	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	18.1	0.0	0.0	0.2	0.2				23.3	0.0	25.0
Incr Delay (d2), s/veh	0.0	2.1	0.0	0.0	1.2	2.5				5.2	0.0	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.5	0.0	0.0	0.4	0.6				13.0	0.0	17.8
LnGrp Delay(d),s/veh	0.0	20.3	0.0	0.0	1.4	2.7				28.5	0.0	39.9
LnGrp LOS		C			A	A				C		D
Approach Vol, veh/h		1822			1286						1182	
Approach Delay, s/veh		20.3			1.8						34.6	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		49.2		40.8		49.2		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		28.7		34.9		2.4		
Green Ext Time (p_c), s		9.2		2.4		26.4		

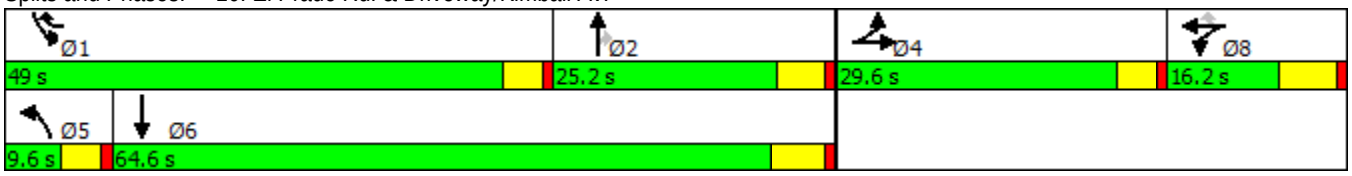
Intersection Summary	
HCM 2010 Ctrl Delay	18.7
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	1	27	1298	5	293	33	754	213
Future Volume (vph)	12	1	27	1298	5	293	33	754	213
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	58.0	5.1	20.5	20.5	45.6	60.4
Actuated g/C Ratio	0.13	0.13	0.11	0.60	0.05	0.21	0.21	0.48	0.63
v/c Ratio	0.06	0.01	0.31	1.13	0.06	0.78	0.08	1.00	0.12
Control Delay	40.2	30.3	50.1	84.8	52.6	54.0	0.3	62.6	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.3	50.1	84.8	52.6	54.0	0.3	62.6	9.4
LOS	D	C	D	F	D	D	A	E	A
Approach Delay		38.2	83.3			48.6			49.1
Approach LOS		D	F			D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 66.1	Intersection LOS: E
Intersection Capacity Utilization 121.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	2	29	27	1298	5	293	33	754	213	44
Future Volume (veh/h)	12	1	2	29	27	1298	5	293	33	754	213	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	1	1	30	28	463	5	299	34	769	217	45
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	52	27	27	93	87	856	83	342	290	740	1685	343
Arrive On Green	0.03	0.03	0.03	0.10	0.10	0.10	0.05	0.19	0.19	0.46	0.60	0.60
Sat Flow, veh/h	1619	827	827	908	847	1530	1619	1800	1530	1619	2831	576
Grp Volume(v), veh/h	12	0	2	58	0	463	5	299	34	769	129	133
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1698
Q Serve(g_s), s	0.7	0.0	0.1	3.0	0.0	10.0	0.3	15.7	1.8	44.4	3.2	3.3
Cycle Q Clear(g_c), s	0.7	0.0	0.1	3.0	0.0	10.0	0.3	15.7	1.8	44.4	3.2	3.3
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	52	0	54	181	0	856	83	342	290	740	1018	1010
V/C Ratio(X)	0.23	0.00	0.04	0.32	0.00	0.54	0.06	0.88	0.12	1.04	0.13	0.13
Avail Cap(c_a), veh/h	416	0	425	181	0	856	83	370	315	740	1035	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	0.0	45.6	40.4	0.0	13.5	43.9	38.3	32.6	26.4	8.6	8.6
Incr Delay (d2), s/veh	2.2	0.0	0.3	1.0	0.0	0.7	0.1	19.2	0.2	43.8	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	1.5	0.0	8.0	0.1	9.6	0.8	28.7	1.5	1.6
LnGrp Delay(d),s/veh	48.0	0.0	45.8	41.5	0.0	14.2	44.0	57.5	32.8	70.2	8.7	8.7
LnGrp LOS	D		D	D		B	D	E	C	F	A	A
Approach Vol, veh/h		14			521			338			1031	
Approach Delay, s/veh		47.7			17.2			54.8			54.6	
Approach LOS		D			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	49.0	24.2		7.7	9.6	63.6		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	46.4	17.7		2.7	2.3	5.3		12.0
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	3.4		0.0

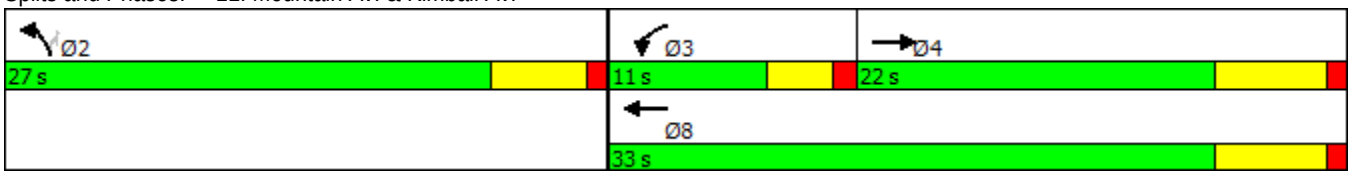
Intersection Summary	
HCM 2010 Ctrl Delay	44.4
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	674	135	1118	283	51
Future Volume (vph)	674	135	1118	283	51
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	15.3	7.4	23.4	13.1	13.1
Actuated g/C Ratio	0.32	0.15	0.48	0.27	0.27
v/c Ratio	0.78	0.57	0.71	0.68	0.12
Control Delay	23.3	36.0	13.1	25.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	36.0	13.1	25.0	5.4
LOS	C	D	B	C	A
Approach Delay	23.3		15.6	22.0	
Approach LOS	C		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 48.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 62.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	674	131	135	1118	283	51
Future Volume (veh/h)	674	131	135	1118	283	51
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	702	131	141	1165	295	48
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	911	170	206	1817	360	340
Arrive On Green	0.32	0.32	0.13	0.53	0.22	0.22
Sat Flow, veh/h	2968	537	1619	3510	1619	1530
Grp Volume(v), veh/h	417	416	141	1165	295	48
Grp Sat Flow(s),veh/h/ln	1710	1705	1619	1710	1619	1530
Q Serve(g_s), s	10.1	10.1	3.8	11.1	7.9	1.2
Cycle Q Clear(g_c), s	10.1	10.1	3.8	11.1	7.9	1.2
Prop In Lane		0.31	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	541	540	206	1817	360	340
V/C Ratio(X)	0.77	0.77	0.68	0.64	0.82	0.14
Avail Cap(c_a), veh/h	597	595	247	2015	767	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.2	14.2	19.1	7.6	17.0	14.3
Incr Delay (d2), s/veh	4.7	4.8	3.8	0.4	1.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	5.5	1.9	5.3	3.7	0.5
LnGrp Delay(d),s/veh	18.9	18.9	23.0	8.0	18.7	14.4
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	833			1306	343	
Approach Delay, s/veh	18.9			9.6	18.1	
Approach LOS	B			A	B	

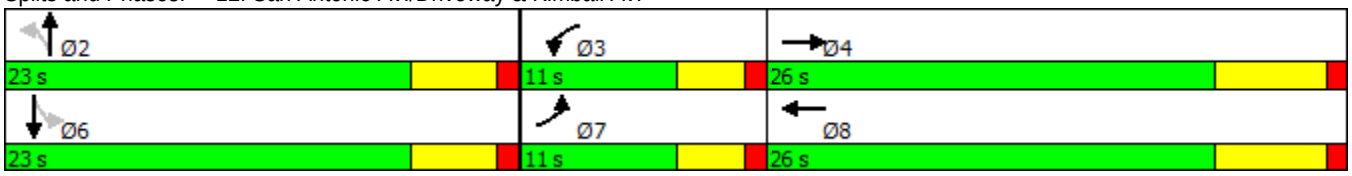
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		15.5	9.8	20.5				30.3
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		9.9	5.8	12.1				13.1
Green Ext Time (p_c), s		0.2	0.0	2.4				5.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	604	38	1257	65	0	46	0
Future Volume (vph)	38	604	38	1257	65	0	46	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	26.0	11.0	26.0	23.0	23.0	23.0	23.0
Total Split (%)	18.3%	43.3%	18.3%	43.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.3	20.7	7.3	20.7	9.0	9.0	9.0	9.0
Actuated g/C Ratio	0.16	0.46	0.16	0.46	0.20	0.20	0.20	0.20
v/c Ratio	0.15	0.45	0.15	0.86	0.27	0.03	0.19	0.01
Control Delay	21.7	11.1	21.7	22.5	19.0	0.1	17.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	11.1	21.7	22.5	19.0	0.1	17.9	0.0
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.7		22.5		15.4		16.2
Approach LOS		B		C		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44.7	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	604	67	38	1257	18	65	0	15	46	0	5
Future Volume (veh/h)	38	604	67	38	1257	18	65	0	15	46	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	40	643	71	40	1337	19	69	0	13	49	0	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1356	150	100	1511	21	378	0	245	370	0	245
Arrive On Green	0.06	0.44	0.44	0.06	0.44	0.44	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	1619	3099	342	1619	3452	49	1354	0	1530	1344	0	1530
Grp Volume(v), veh/h	40	354	360	40	662	694	69	0	13	49	0	5
Grp Sat Flow(s),veh/h/ln	1619	1710	1731	1619	1710	1791	1354	0	1530	1344	0	1530
Q Serve(g_s), s	1.0	6.4	6.4	1.0	15.5	15.6	2.0	0.0	0.3	1.4	0.0	0.1
Cycle Q Clear(g_c), s	1.0	6.4	6.4	1.0	15.5	15.6	2.1	0.0	0.3	1.7	0.0	0.1
Prop In Lane	1.00		0.20	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	748	758	100	748	784	378	0	245	370	0	245
V/C Ratio(X)	0.40	0.47	0.47	0.40	0.88	0.89	0.18	0.00	0.05	0.13	0.00	0.02
Avail Cap(c_a), veh/h	259	782	792	259	782	819	721	0	633	711	0	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	8.7	8.7	19.7	11.3	11.3	16.4	0.0	15.6	16.3	0.0	15.5
Incr Delay (d2), s/veh	1.0	0.2	0.2	1.0	10.9	10.6	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.0	3.0	0.5	9.4	9.8	0.7	0.0	0.1	0.5	0.0	0.1
LnGrp Delay(d),s/veh	20.7	8.9	8.9	20.7	22.2	21.9	16.4	0.0	15.6	16.3	0.0	15.5
LnGrp LOS	C	A	A	C	C	C	B		B	B		B
Approach Vol, veh/h		754			1396			82			54	
Approach Delay, s/veh		9.5			22.0			16.3			16.3	
Approach LOS		A			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.7	25.1		11.9	6.7	25.1
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		4.1	3.0	8.4		3.7	3.0	17.6
Green Ext Time (p_c), s		0.1	0.0	4.7		0.1	0.0	1.6

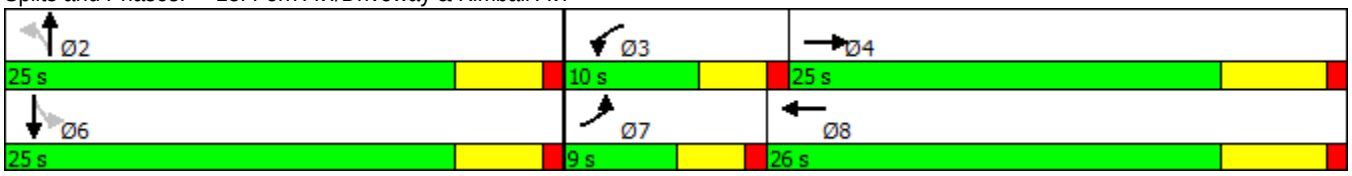
Intersection Summary	
HCM 2010 Ctrl Delay	17.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	37	549	40	1305	47	0	65	1
Future Volume (vph)	37	549	40	1305	47	0	65	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	20.8	5.5	21.2	8.1	8.1	8.1	8.1
Actuated g/C Ratio	0.12	0.48	0.13	0.49	0.19	0.19	0.19	0.19
v/c Ratio	0.21	0.42	0.21	0.88	0.22	0.06	0.31	0.03
Control Delay	24.4	10.5	23.5	23.3	17.4	0.2	19.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	10.5	23.5	23.3	17.4	0.2	19.0	9.6
LOS	C	B	C	C	B	A	B	A
Approach Delay		11.3		23.3		11.1		17.8
Approach LOS		B		C		B		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 43.3
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 19.1 — Intersection LOS: B
Intersection Capacity Utilization 58.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	549	69	40	1305	20	47	0	27	65	1	8
Future Volume (veh/h)	37	549	69	40	1305	20	47	0	27	65	1	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	41	610	70	44	1450	22	52	0	20	72	1	8
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	74	1456	167	78	1636	25	335	0	187	324	21	169
Arrive On Green	0.05	0.47	0.47	0.05	0.47	0.47	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1619	3085	353	1619	3448	52	1349	0	1530	1336	173	1383
Grp Volume(v), veh/h	41	338	342	44	719	753	52	0	20	72	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1729	1619	1710	1791	1349	0	1530	1336	0	1556
Q Serve(g_s), s	1.0	5.3	5.3	1.1	15.6	15.6	1.4	0.0	0.5	2.1	0.0	0.2
Cycle Q Clear(g_c), s	1.0	5.3	5.3	1.1	15.6	15.6	1.7	0.0	0.5	2.5	0.0	0.2
Prop In Lane	1.00		0.20	1.00		0.03	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	74	807	816	78	811	850	335	0	187	324	0	190
V/C Ratio(X)	0.56	0.42	0.42	0.56	0.89	0.89	0.16	0.00	0.11	0.22	0.00	0.05
Avail Cap(c_a), veh/h	198	808	817	238	850	890	833	0	753	818	0	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	7.1	7.1	19.0	9.7	9.7	16.5	0.0	15.9	17.1	0.0	15.8
Incr Delay (d2), s/veh	2.4	0.1	0.1	2.4	10.2	10.0	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.5	2.5	0.5	9.5	9.9	0.5	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	21.5	7.2	7.2	21.4	20.0	19.7	16.6	0.0	16.0	17.2	0.0	15.9
LnGrp LOS	C	A	A	C	B	B	B		B	B		B
Approach Vol, veh/h		721			1516			72			81	
Approach Delay, s/veh		8.0			19.9			16.5			17.0	
Approach LOS		A			B			B			B	

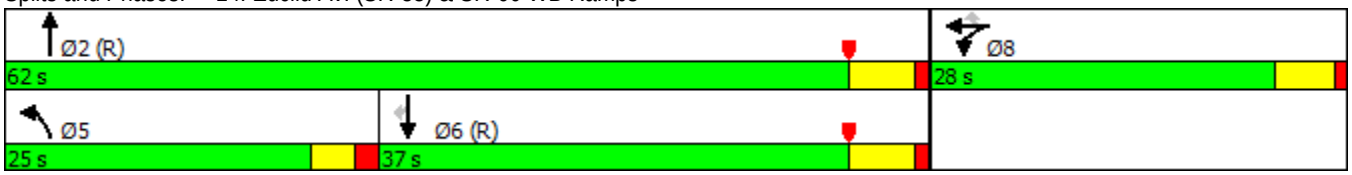
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	6.0	25.0		9.9	5.9	25.1
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.7	3.1	7.3		4.5	3.0	17.6
Green Ext Time (p_c), s		0.2	0.0	5.1		0.1	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	757	2	393	465	1001	1074	499
Future Volume (vph)	757	2	393	465	1001	1074	499
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.0	23.0	23.0	20.5	56.5	31.5	31.5
Actuated g/C Ratio	0.26	0.26	0.26	0.23	0.63	0.35	0.35
v/c Ratio	1.10	1.07	0.84	1.36	0.50	0.96	0.63
Control Delay	108.9	99.0	41.4	193.8	22.1	48.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	3.2	2.6	0.0
Total Delay	108.9	99.0	41.4	193.8	25.3	51.3	5.7
LOS	F	F	D	F	C	D	A
Approach Delay		84.7			78.8	36.8	
Approach LOS		F			E	D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.36	
Intersection Signal Delay: 64.7	Intersection LOS: E
Intersection Capacity Utilization 138.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	757	2	393	465	1001	0	0	1074	499
Future Volume (veh/h)	0	0	0	757	2	393	465	1001	0	0	1074	499
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				898	0	179	500	1076	0	0	1155	537
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				828	0	391	369	2147	0	0	1197	515
Arrive On Green				0.26	0.00	0.26	0.46	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1473
Grp Volume(v), veh/h				898	0	179	500	1076	0	0	1155	537
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1473
Q Serve(g_s), s				23.0	0.0	8.9	20.5	0.0	0.0	0.0	29.8	31.5
Cycle Q Clear(g_c), s				23.0	0.0	8.9	20.5	0.0	0.0	0.0	29.8	31.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				828	0	391	369	2147	0	0	1197	515
V/C Ratio(X)				1.09	0.00	0.46	1.36	0.50	0.00	0.00	0.96	1.04
Avail Cap(c_a), veh/h				828	0	391	369	2147	0	0	1197	515
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.19	0.19	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.5	0.0	28.2	24.5	0.0	0.0	0.0	28.7	29.3
Incr Delay (d2), s/veh				57.0	0.0	0.3	163.6	0.2	0.0	0.0	18.8	51.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.8	0.0	3.8	25.8	0.0	0.0	0.0	17.1	20.0
LnGrp Delay(d),s/veh				90.5	0.0	28.6	188.1	0.2	0.0	0.0	47.6	80.2
LnGrp LOS				F		C	F	A			D	F
Approach Vol, veh/h					1077			1576			1692	
Approach Delay, s/veh					80.2			59.8			57.9	
Approach LOS					F			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			25.0	37.0		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			22.5	33.5		25.0
Green Ext Time (p_c), s		44.0			0.0	0.0		0.0

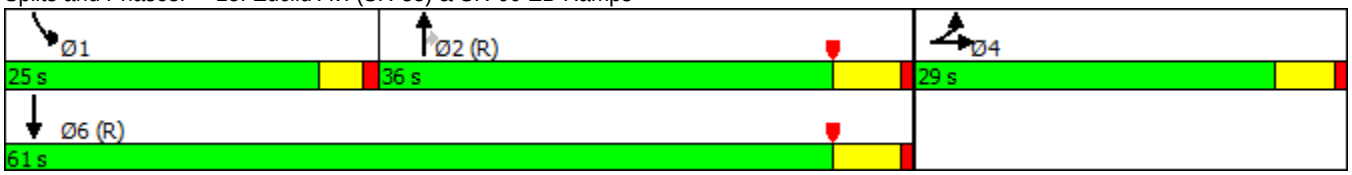
Intersection Summary	
HCM 2010 Ctrl Delay	64.1
HCM 2010 LOS	E

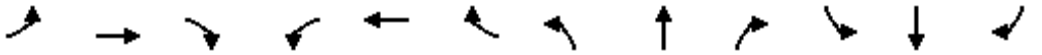
Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	351	0	1115	660	311	1520
Future Volume (vph)	351	0	1115	660	311	1520
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	31.4	31.4	20.1	55.5
Actuated g/C Ratio	0.27	0.27	0.35	0.35	0.22	0.62
v/c Ratio	0.82	1.56	0.99	0.74	0.92	0.77
Control Delay	49.3	287.8	55.9	8.4	44.0	5.7
Queue Delay	12.7	1.3	0.0	0.0	0.0	4.4
Total Delay	62.0	289.1	55.9	8.4	44.0	10.1
LOS	E	F	E	A	D	B
Approach Delay		215.3	38.2			15.9
Approach LOS		F	D			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.56	
Intersection Signal Delay: 66.9	Intersection LOS: E
Intersection Capacity Utilization 138.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	351	0	622	0	0	0	0	1115	660	311	1520	0
Future Volume (veh/h)	351	0	622	0	0	0	0	1115	660	311	1520	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	373	0	579				0	1186	702	331	1617	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	432	0	408				0	1201	534	358	2109	0
Arrive On Green	0.27	0.00	0.27				0.00	0.35	0.35	0.29	0.82	0.00
Sat Flow, veh/h	1619	0	1530				0	3510	1521	1619	3510	0
Grp Volume(v), veh/h	373	0	579				0	1186	702	331	1617	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1521	1619	1710	0
Q Serve(g_s), s	19.8	0.0	24.0				0.0	31.0	31.6	17.8	20.6	0.0
Cycle Q Clear(g_c), s	19.8	0.0	24.0				0.0	31.0	31.6	17.8	20.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	408				0	1201	534	358	2109	0
V/C Ratio(X)	0.86	0.00	1.42				0.00	0.99	1.31	0.92	0.77	0.00
Avail Cap(c_a), veh/h	432	0	408				0	1201	534	378	2109	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.69	0.69	0.09	0.09	0.00
Uniform Delay (d), s/veh	31.4	0.0	33.0				0.0	29.0	29.2	31.0	5.0	0.0
Incr Delay (d2), s/veh	15.8	0.0	202.5				0.0	18.9	150.7	3.8	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	0.0	33.0				0.0	17.8	35.6	8.3	9.2	0.0
LnGrp Delay(d),s/veh	47.2	0.0	235.5				0.0	47.9	179.9	34.9	5.2	0.0
LnGrp LOS	D		F					D	F	C	A	
Approach Vol, veh/h		952						1888			1948	
Approach Delay, s/veh		161.7						97.0			10.2	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.9	37.1		29.0		61.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	19.8	33.6		26.0		22.6		
Green Ext Time (p_c), s	0.1	0.0		0.0		31.5		

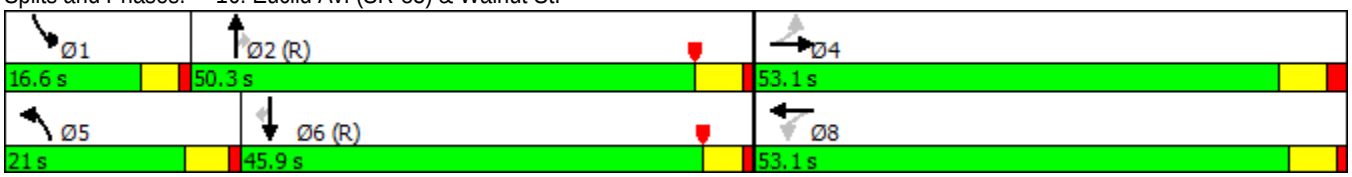
Intersection Summary	
HCM 2010 Ctrl Delay	74.6
HCM 2010 LOS	E

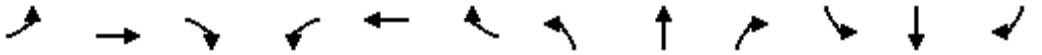
Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	159	352	92	326	119	1412	55	167	1683	61
Future Volume (vph)	159	352	92	326	119	1412	55	167	1683	61
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	34.8	34.8	35.8	35.8	13.7	58.2	58.2	10.9	55.8	55.8
Actuated g/C Ratio	0.29	0.29	0.30	0.30	0.11	0.48	0.48	0.09	0.46	0.46
v/c Ratio	1.06	0.50	0.52	0.52	0.68	0.62	0.07	0.66	0.78	0.09
Control Delay	129.9	32.6	42.5	28.1	56.3	24.2	6.1	64.7	32.3	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	129.9	32.6	42.5	28.1	56.3	24.2	6.1	64.7	32.3	5.5
LOS	F	C	D	C	E	C	A	E	C	A
Approach Delay		57.4		30.3		26.0			34.3	
Approach LOS		E		C		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 34.1	Intersection LOS: C
Intersection Capacity Utilization 85.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	352	112	92	326	182	119	1412	55	167	1683	61
Future Volume (veh/h)	159	352	112	92	326	182	119	1412	55	167	1683	61
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	167	371	96	97	343	159	125	1486	39	176	1772	35
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	264	957	245	282	807	366	150	2140	666	224	2039	634
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.03	0.14	0.14	0.08	0.41	0.41
Sat Flow, veh/h	859	2698	690	888	2274	1033	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	167	234	233	97	256	246	125	1486	39	176	1772	35
Grp Sat Flow(s),veh/h/ln	859	1710	1678	888	1710	1597	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	22.1	12.2	12.5	11.0	13.6	14.1	9.2	34.5	2.6	7.0	39.6	1.6
Cycle Q Clear(g_c), s	36.2	12.2	12.5	23.5	13.6	14.1	9.2	34.5	2.6	7.0	39.6	1.6
Prop In Lane	1.00		0.41	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	607	595	282	607	566	150	2140	666	224	2039	634
V/C Ratio(X)	0.63	0.39	0.39	0.34	0.42	0.43	0.83	0.69	0.06	0.79	0.87	0.06
Avail Cap(c_a), veh/h	294	667	654	321	681	636	217	2140	666	298	2039	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.37	0.37	0.37	0.55	0.55	0.55
Uniform Delay (d), s/veh	43.3	28.9	29.0	37.8	29.4	29.5	57.2	43.8	30.1	54.5	32.1	21.0
Incr Delay (d2), s/veh	3.7	0.4	0.4	0.7	0.5	0.5	6.8	0.7	0.1	3.9	3.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	5.8	5.8	2.8	6.5	6.3	4.4	15.8	1.1	3.0	18.5	0.7
LnGrp Delay(d),s/veh	47.0	29.3	29.4	38.6	29.9	30.1	64.0	44.5	30.2	58.4	35.2	21.1
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	D	C
Approach Vol, veh/h		634			599			1650			1983	
Approach Delay, s/veh		34.0			31.3			45.6			37.0	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.6	57.6		48.9	16.0	55.1		48.9
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	9.0	36.5		38.2	11.2	41.6		25.5
Green Ext Time (p_c), s	0.1	7.8		4.4	0.1	0.0		7.4

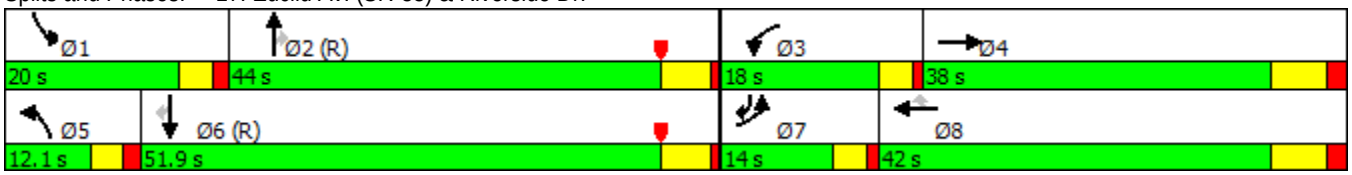
Intersection Summary			
HCM 2010 Ctrl Delay		38.9	
HCM 2010 LOS		D	

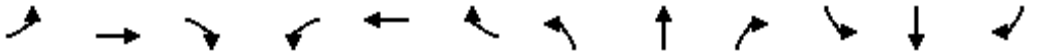
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	150	344	182	404	53	66	1003	178	189	1086	156
Future Volume (vph)	150	344	182	404	53	66	1003	178	189	1086	156
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	38.0	18.0	42.0	42.0	12.1	44.0	44.0	20.0	51.9	14.0
Total Split (%)	11.7%	31.7%	15.0%	35.0%	35.0%	10.1%	36.7%	36.7%	16.7%	43.3%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	10.9	21.6	14.9	25.6	25.6	9.8	42.3	42.3	20.3	55.0	71.4
Actuated g/C Ratio	0.09	0.18	0.12	0.21	0.21	0.08	0.35	0.35	0.17	0.46	0.60
v/c Ratio	1.08	0.69	0.96	0.58	0.13	0.53	0.88	0.29	0.73	0.73	0.17
Control Delay	150.4	50.0	107.6	45.2	0.6	86.5	30.3	3.7	80.5	11.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	150.4	50.0	107.6	45.2	0.6	86.5	30.3	3.7	80.5	11.0	0.3
LOS	F	D	F	D	A	F	C	A	F	B	A
Approach Delay		77.4		59.3			29.5			19.0	
Approach LOS		E		E			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 37.4	Intersection LOS: D
Intersection Capacity Utilization 82.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	344	55	182	404	53	66	1003	178	189	1086	156
Future Volume (veh/h)	150	344	55	182	404	53	66	1003	178	189	1086	156
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	158	362	35	192	425	51	69	1056	106	199	1143	98
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	556	53	189	718	321	86	1377	616	209	1638	860
Arrive On Green	0.08	0.18	0.18	0.12	0.21	0.21	0.07	0.54	0.54	0.26	0.96	0.96
Sat Flow, veh/h	1619	3149	303	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	158	196	201	192	425	51	69	1056	106	199	1143	98
Grp Sat Flow(s),veh/h/ln	1619	1710	1741	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	10.0	12.8	12.9	14.0	13.5	3.3	5.0	29.2	4.3	14.5	5.1	0.3
Cycle Q Clear(g_c), s	10.0	12.8	12.9	14.0	13.5	3.3	5.0	29.2	4.3	14.5	5.1	0.3
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	302	307	189	718	321	86	1377	616	209	1638	860
V/C Ratio(X)	1.17	0.65	0.66	1.02	0.59	0.16	0.81	0.77	0.17	0.95	0.70	0.11
Avail Cap(c_a), veh/h	135	442	450	189	998	446	103	1377	616	209	1638	860
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.66	0.66	0.66	0.56	0.56	0.56
Uniform Delay (d), s/veh	55.0	45.9	46.0	53.0	42.8	38.8	55.2	23.4	17.6	44.1	1.4	0.9
Incr Delay (d2), s/veh	130.7	3.3	3.4	69.8	1.1	0.3	22.5	2.8	0.4	34.1	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	6.3	6.5	9.9	6.5	1.4	2.8	14.2	1.9	8.4	1.9	0.2
LnGrp Delay(d),s/veh	185.7	49.3	49.4	123.0	43.9	39.1	77.6	26.2	18.0	78.3	2.8	1.1
LnGrp LOS	F	D	D	F	D	D	E	C	B	E	A	A
Approach Vol, veh/h		555			668			1231			1440	
Approach Delay, s/veh		88.2			66.3			28.4			13.1	
Approach LOS		F			E			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	53.8	18.0	28.2	10.8	63.0	14.0	32.2
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	38.5	14.0	31.0	7.6	46.4	10.0	35.0
Max Q Clear Time (g_c+I1), s	16.5	31.2	16.0	14.9	7.0	7.1	12.0	15.5
Green Ext Time (p_c), s	0.0	6.2	0.0	6.1	0.0	22.8	0.0	6.7

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	105	128	66	65	168	72	1375	143	30	1682	102
Future Volume (vph)	105	128	66	65	168	72	1375	143	30	1682	102
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.8	26.8	26.8		26.8	9.9	73.4	73.4	6.9	68.6	68.6
Actuated g/C Ratio	0.22	0.22	0.22		0.22	0.08	0.61	0.61	0.06	0.57	0.57
v/c Ratio	0.69	0.34	0.17		0.83	0.57	0.69	0.16	0.35	0.91	0.12
Control Delay	63.3	39.8	4.3		62.6	66.6	18.9	4.4	49.9	45.9	13.7
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	39.8	4.3		62.6	66.6	18.9	4.4	49.9	45.9	13.7
LOS	E	D	A		E	E	B	A	D	D	B
Approach Delay		40.3			62.6		19.7			44.2	
Approach LOS		D			E		B			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 96.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	128	66	65	168	38	72	1375	143	30	1682	102
Future Volume (veh/h)	105	128	66	65	168	38	72	1375	143	30	1682	102
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	111	135	45	68	177	36	76	1447	115	32	1771	78
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	206	422	354	103	232	44	93	2054	919	44	1950	872
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.12	1.00	1.00	0.02	0.38	0.38
Sat Flow, veh/h	1121	1800	1510	282	988	187	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	111	135	45	281	0	0	76	1447	115	32	1771	78
Grp Sat Flow(s),veh/h/ln	1121	1800	1510	1457	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	1.4	7.4	2.8	15.1	0.0	0.0	5.5	0.0	0.0	2.4	58.8	3.9
Cycle Q Clear(g_c), s	24.0	7.4	2.8	22.6	0.0	0.0	5.5	0.0	0.0	2.4	58.8	3.9
Prop In Lane	1.00		1.00	0.24		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	206	422	354	379	0	0	93	2054	919	44	1950	872
V/C Ratio(X)	0.54	0.32	0.13	0.74	0.00	0.00	0.81	0.70	0.13	0.72	0.91	0.09
Avail Cap(c_a), veh/h	289	555	466	496	0	0	169	2054	919	101	1950	872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.51	0.51	0.51	0.56	0.56	0.56
Uniform Delay (d), s/veh	45.1	38.0	36.2	44.2	0.0	0.0	52.4	0.0	0.0	58.5	34.1	17.1
Incr Delay (d2), s/veh	2.2	0.4	0.2	4.2	0.0	0.0	3.3	1.1	0.1	4.6	4.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.8	1.2	9.3	0.0	0.0	2.5	0.3	0.0	1.1	29.0	1.7
LnGrp Delay(d),s/veh	47.3	38.4	36.4	48.5	0.0	0.0	55.7	1.1	0.1	63.1	38.7	17.3
LnGrp LOS	D	D	D	D			E	A	A	E	D	B
Approach Vol, veh/h		291			281			1638			1881	
Approach Delay, s/veh		41.5			48.5			3.5			38.2	
Approach LOS		D			D			A			D	

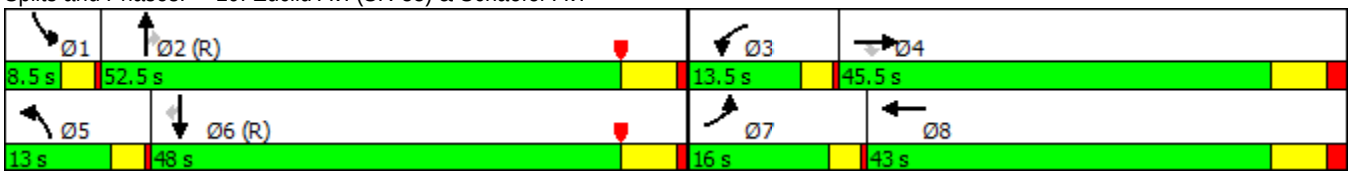
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	78.1		35.1	10.4	74.4		35.1
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.4	2.0		26.0	7.5	60.8		24.6
Green Ext Time (p_c), s	0.0	45.0		2.2	0.0	0.0		2.3

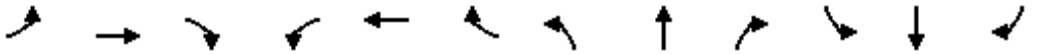
Intersection Summary	
HCM 2010 Ctrl Delay	25.3
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	63	118	58	123	122	1453	21	15	1630	137
Future Volume (vph)	145	63	118	58	123	122	1453	21	15	1630	137
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.5	23.0	23.0	10.0	17.8	15.0	69.5	69.5	5.4	54.7	54.7
Actuated g/C Ratio	0.10	0.19	0.19	0.08	0.15	0.12	0.58	0.58	0.04	0.46	0.46
v/c Ratio	0.92	0.19	0.32	0.46	0.56	0.65	0.78	0.02	0.22	1.11	0.20
Control Delay	104.6	40.6	8.0	64.3	51.6	42.2	32.4	1.2	60.8	89.1	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.6	40.6	8.0	64.3	51.6	42.2	32.4	1.2	60.8	89.1	8.6
LOS	F	D	A	E	D	D	C	A	E	F	A
Approach Delay		57.2			55.3		32.8			82.7	
Approach LOS		E			E		C			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 58.8	Intersection LOS: E
Intersection Capacity Utilization 89.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	63	118	58	123	18	122	1453	21	15	1630	137
Future Volume (veh/h)	145	63	118	58	123	18	122	1453	21	15	1630	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	154	67	74	62	131	17	130	1546	17	16	1734	98
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	169	249	211	118	167	22	128	2070	926	28	1858	812
Arrive On Green	0.10	0.14	0.14	0.07	0.11	0.11	0.03	0.20	0.20	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1562	203	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	154	67	74	62	0	148	130	1546	17	16	1734	98
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	11.3	4.0	5.3	4.4	0.0	9.8	9.5	51.0	1.1	1.2	60.0	6.6
Cycle Q Clear(g_c), s	11.3	4.0	5.3	4.4	0.0	9.8	9.5	51.0	1.1	1.2	60.0	6.6
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	249	211	118	0	188	128	2070	926	28	1858	812
V/C Ratio(X)	0.91	0.27	0.35	0.53	0.00	0.79	1.01	0.75	0.02	0.57	0.93	0.12
Avail Cap(c_a), veh/h	169	578	491	135	0	529	128	2070	926	67	1858	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.23	0.23	0.23	0.36	0.36	0.36
Uniform Delay (d), s/veh	53.2	46.3	46.8	53.6	0.0	52.3	58.4	39.4	19.4	59.2	47.1	25.2
Incr Delay (d2), s/veh	44.2	0.4	0.7	1.4	0.0	5.3	41.9	0.6	0.0	2.5	4.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	2.0	2.3	2.0	0.0	5.0	5.8	24.4	0.5	0.6	29.6	2.8
LnGrp Delay(d),s/veh	97.4	46.7	47.6	55.0	0.0	57.6	100.4	40.0	19.4	61.7	51.3	25.3
LnGrp LOS	F	D	D	D		E	F	D	B	E	D	C
Approach Vol, veh/h		295			210			1693			1848	
Approach Delay, s/veh		73.4			56.8			44.4			50.1	
Approach LOS		E			E			D			D	

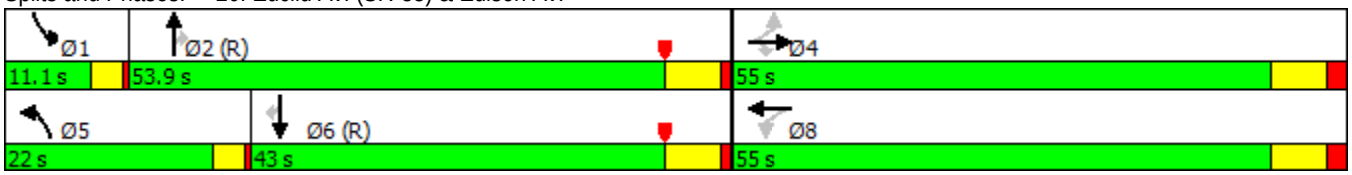
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	78.6	12.2	23.6	13.0	71.2	16.0	19.8
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	53.0	6.4	7.3	11.5	62.0	13.3	11.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0

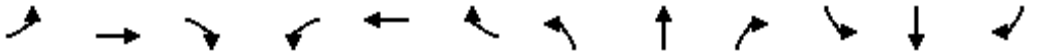
Intersection Summary	
HCM 2010 Ctrl Delay	49.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	222	172	227	69	356	253	1297	38	42	1464	257
Future Volume (vph)	222	172	227	69	356	253	1297	38	42	1464	257
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	45.0	45.0	45.0	45.0	45.0	21.3	53.3	53.3	6.8	37.2	37.2
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.18	0.44	0.44	0.06	0.31	0.31
v/c Ratio	1.12	0.27	0.33	0.18	0.63	0.94	0.91	0.06	0.49	1.47	0.49
Control Delay	133.0	26.5	4.2	25.3	34.6	79.0	45.0	5.2	83.7	231.9	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.0	26.5	4.2	25.3	34.6	79.0	45.0	5.2	83.7	231.9	2.9
LOS	F	C	A	C	C	E	D	A	F	F	A
Approach Delay		56.4			33.2		49.5			195.0	
Approach LOS		E			C		D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.47	
Intersection Signal Delay: 106.5	Intersection LOS: F
Intersection Capacity Utilization 115.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	172	227	69	356	41	253	1297	38	42	1464	257
Future Volume (veh/h)	222	172	227	69	356	41	253	1297	38	42	1464	257
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	236	183	174	73	379	42	269	1380	25	45	1557	242
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	257	720	612	386	637	71	250	1465	655	55	1054	471
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.21	0.57	0.57	0.07	0.62	0.62
Sat Flow, veh/h	926	1800	1530	983	1592	176	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	236	183	174	73	0	421	269	1380	25	45	1557	242
Grp Sat Flow(s),veh/h/ln	926	1800	1530	983	0	1769	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	25.5	8.1	9.2	6.4	0.0	22.5	18.5	45.0	0.9	3.3	37.0	10.7
Cycle Q Clear(g_c), s	48.0	8.1	9.2	14.6	0.0	22.5	18.5	45.0	0.9	3.3	37.0	10.7
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	257	720	612	386	0	707	250	1465	655	55	1055	471
V/C Ratio(X)	0.92	0.25	0.28	0.19	0.00	0.60	1.08	0.94	0.04	0.81	1.48	0.51
Avail Cap(c_a), veh/h	257	720	612	386	0	707	250	1465	655	103	1055	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.75	0.75	0.75	0.09	0.09	0.09
Uniform Delay (d), s/veh	49.4	24.0	24.4	28.9	0.0	28.3	47.7	24.5	15.0	55.5	23.0	18.0
Incr Delay (d2), s/veh	35.2	0.2	0.3	0.2	0.0	1.4	71.5	10.6	0.1	1.0	214.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.3	4.1	4.0	1.8	0.0	11.3	13.2	23.1	0.4	1.5	48.5	4.5
LnGrp Delay(d),s/veh	84.5	24.2	24.6	29.1	0.0	29.7	119.2	35.1	15.0	56.5	237.9	18.3
LnGrp LOS	F	C	C	C		C	F	D	B	E	F	B
Approach Vol, veh/h		593			494			1674			1844	
Approach Delay, s/veh		48.3			29.6			48.3			204.7	
Approach LOS		D			C			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	57.4		55.0	22.0	43.0		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.3	47.0		50.0	20.5	39.0		24.5
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.0		5.9

Intersection Summary		
HCM 2010 Ctrl Delay		108.9
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	56	8	208	20	46	180	1508	7	22	1702	28
Future Volume (vph)	56	8	208	20	46	180	1508	7	22	1702	28
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	21.0	63.5	63.5	9.7	52.2	52.2
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	17.5%	52.9%	52.9%	8.1%	43.5%	43.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.9	15.9	15.9	15.9	15.9	17.8	87.4	87.4	6.2	72.3	72.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.15	0.73	0.73	0.05	0.60	0.60
v/c Ratio	0.37	0.03	0.55	0.12	0.32	0.79	0.63	0.01	0.28	0.86	0.03
Control Delay	49.4	36.6	10.1	40.7	29.3	63.1	9.2	0.0	76.4	15.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	36.6	10.1	40.7	29.3	63.1	9.2	0.0	76.4	15.5	1.2
LOS	D	D	B	D	C	E	A	A	E	B	A
Approach Delay		18.9			31.7		14.9			16.0	
Approach LOS		B			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 83.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	8	208	20	46	32	180	1508	7	22	1702	28
Future Volume (veh/h)	56	8	208	20	46	32	180	1508	7	22	1702	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	58	8	131	21	48	26	188	1571	7	23	1773	25
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	147	196	166	186	120	65	212	2573	1151	36	2201	963
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.13	0.75	0.75	0.01	0.21	0.21
Sat Flow, veh/h	1272	1800	1530	1199	1099	596	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	58	8	131	21	0	74	188	1571	7	23	1773	25
Grp Sat Flow(s),veh/h/ln	1272	1800	1530	1199	0	1695	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	5.3	0.5	10.0	1.9	0.0	4.9	13.7	25.3	0.1	1.7	59.1	1.6
Cycle Q Clear(g_c), s	10.2	0.5	10.0	2.4	0.0	4.9	13.7	25.3	0.1	1.7	59.1	1.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	147	196	166	186	0	184	212	2573	1151	36	2201	963
V/C Ratio(X)	0.40	0.04	0.79	0.11	0.00	0.40	0.89	0.61	0.01	0.64	0.81	0.03
Avail Cap(c_a), veh/h	453	630	535	475	0	593	236	2573	1151	84	2201	963
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.6	47.9	52.1	48.9	0.0	49.8	51.3	6.8	3.7	59.1	40.1	17.5
Incr Delay (d2), s/veh	1.3	0.1	6.1	0.2	0.0	1.0	28.0	1.1	0.0	1.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	4.5	0.6	0.0	2.3	7.8	12.2	0.1	0.8	28.1	0.7
LnGrp Delay(d),s/veh	55.9	47.9	58.2	49.1	0.0	50.9	79.3	7.9	3.7	60.3	40.4	17.5
LnGrp LOS	E	D	E	D		D	E	A	A	E	D	B
Approach Vol, veh/h		197			95			1766			1821	
Approach Delay, s/veh		57.1			50.5			15.5			40.4	
Approach LOS		E			D			B			D	

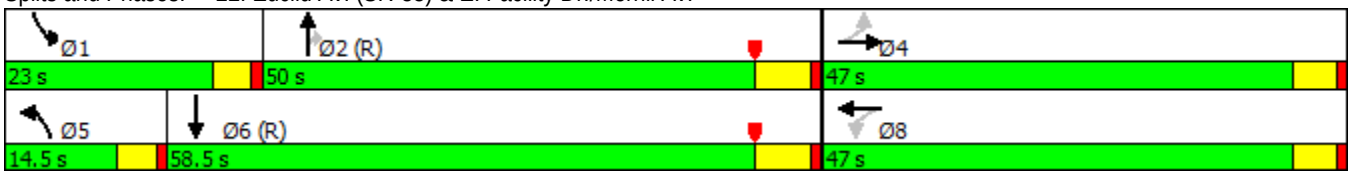
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	96.0		17.8	19.2	82.9		17.8
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	57.8		42.0	17.5	46.5		42.0
Max Q Clear Time (g_c+I1), s	3.7	27.3		12.2	15.7	61.1		6.9
Green Ext Time (p_c), s	0.0	26.9		0.8	0.1	0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	394	49	20	1062	186	484	1437
Future Volume (vph)	8	6	394	49	20	1062	186	484	1437
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		42.0		42.0	10.0	44.0	44.0	18.5	61.2
Actuated g/C Ratio		0.35		0.35	0.08	0.37	0.37	0.15	0.51
v/c Ratio		0.04		2.04	0.16	0.88	0.31	2.03	0.89
Control Delay		22.0		498.7	61.6	27.7	9.5	499.0	27.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.0		498.7	61.6	27.7	9.5	499.0	27.3
LOS		C		F	E	C	A	F	C
Approach Delay		22.0		498.7		25.6			143.3
Approach LOS		C		F		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.04	
Intersection Signal Delay: 195.9	Intersection LOS: F
Intersection Capacity Utilization 146.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	394	49	622	20	1062	186	484	1437	45
Future Volume (veh/h)	8	6	4	394	49	622	20	1062	186	484	1437	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	410	51	602	21	1106	168	504	1497	44
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	205	148	66	243	25	296	68	1254	561	250	1625	48
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.04	0.37	0.37	0.15	0.48	0.48
Sat Flow, veh/h	460	422	189	576	72	846	1619	3420	1530	1619	3393	100
Grp Volume(v), veh/h	17	0	0	1063	0	0	21	1106	168	504	753	788
Grp Sat Flow(s),veh/h/ln	1070	0	0	1493	0	0	1619	1710	1530	1619	1710	1782
Q Serve(g_s), s	0.0	0.0	0.0	41.2	0.0	0.0	1.5	36.3	9.4	18.5	49.2	49.5
Cycle Q Clear(g_c), s	0.8	0.0	0.0	42.0	0.0	0.0	1.5	36.3	9.4	18.5	49.2	49.5
Prop In Lane	0.47		0.18	0.39		0.57	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	419	0	0	564	0	0	68	1254	561	250	819	854
V/C Ratio(X)	0.04	0.00	0.00	1.88	0.00	0.00	0.31	0.88	0.30	2.02	0.92	0.92
Avail Cap(c_a), veh/h	419	0	0	564	0	0	135	1254	561	250	819	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	0.0	40.5	0.0	0.0	55.8	35.6	27.0	50.8	29.1	29.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	404.4	0.0	0.0	0.1	0.9	0.1	472.5	17.1	17.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	82.0	0.0	0.0	0.7	17.2	4.0	41.0	27.1	28.3
LnGrp Delay(d),s/veh	25.6	0.0	0.0	444.9	0.0	0.0	55.9	36.5	27.2	523.3	46.2	46.2
LnGrp LOS	C			F			E	D	C	F	D	D
Approach Vol, veh/h		17			1063			1295			2045	
Approach Delay, s/veh		25.6			444.9			35.6			163.8	
Approach LOS		C			F			D			F	

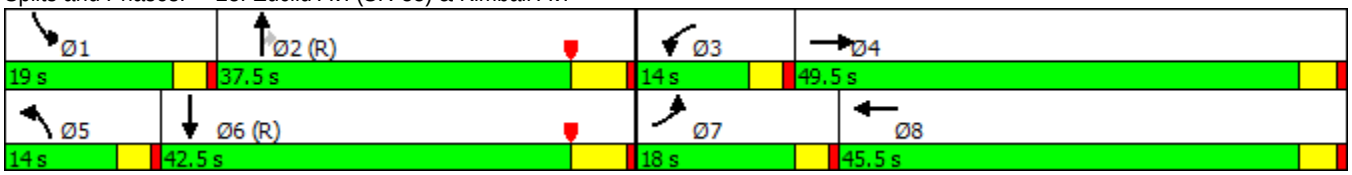
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	50.0		47.0	9.5	63.5		47.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	20.5	38.3		2.8	3.5	51.5		44.0
Green Ext Time (p_c), s	0.0	5.2		6.5	0.0	0.9		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		193.3
HCM 2010 LOS		F

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	282	326	129	596	176	797	189	336	738
Future Volume (vph)	282	326	129	596	176	797	189	336	738
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	14.0	35.8	10.0	31.8	19.2	31.5	31.5	24.2	36.5
Actuated g/C Ratio	0.12	0.30	0.08	0.26	0.16	0.26	0.26	0.20	0.30
v/c Ratio	1.53	0.38	0.99	0.82	0.70	0.91	0.36	1.06	1.28
Control Delay	300.5	32.1	129.2	48.0	45.5	44.4	10.6	86.8	150.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	300.5	32.1	129.2	48.0	45.5	44.4	10.6	86.8	150.5
LOS	F	C	F	D	D	D	B	F	F
Approach Delay		147.8		60.2		39.1			138.0
Approach LOS		F		E		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.53	
Intersection Signal Delay: 98.0	Intersection LOS: F
Intersection Capacity Utilization 108.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	282	326	46	129	596	131	176	797	189	336	738	635
Future Volume (veh/h)	282	326	46	129	596	131	176	797	189	336	738	635
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	288	333	45	132	608	112	180	813	185	343	753	610
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	189	861	115	135	723	133	135	1209	541	202	714	565
Arrive On Green	0.12	0.28	0.28	0.08	0.25	0.25	0.03	0.12	0.12	0.13	0.40	0.40
Sat Flow, veh/h	1619	3032	406	1619	2886	531	1619	3420	1530	1619	1807	1430
Grp Volume(v), veh/h	288	187	191	132	360	360	180	813	185	343	712	651
Grp Sat Flow(s),veh/h/ln	1619	1710	1728	1619	1710	1706	1619	1710	1530	1619	1710	1526
Q Serve(g_s), s	14.0	10.5	10.7	9.8	24.0	24.1	10.0	27.3	13.3	15.0	47.4	47.4
Cycle Q Clear(g_c), s	14.0	10.5	10.7	9.8	24.0	24.1	10.0	27.3	13.3	15.0	47.4	47.4
Prop In Lane	1.00		0.24	1.00		0.31	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	189	486	491	135	429	428	135	1209	541	202	676	603
V/C Ratio(X)	1.52	0.38	0.39	0.98	0.84	0.84	1.33	0.67	0.34	1.69	1.05	1.08
Avail Cap(c_a), veh/h	189	641	648	135	584	583	135	1209	541	202	676	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.30	0.30	0.30	0.34	0.34	0.34
Uniform Delay (d), s/veh	53.0	34.5	34.6	54.9	42.7	42.7	58.4	46.3	40.2	52.5	36.3	36.3
Incr Delay (d2), s/veh	259.2	0.5	0.5	70.4	5.9	6.1	165.0	0.9	0.5	319.8	35.9	46.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.8	5.0	5.2	7.0	12.0	12.0	10.7	13.1	5.7	24.7	29.1	27.7
LnGrp Delay(d),s/veh	312.2	35.0	35.1	125.3	48.6	48.8	223.4	47.3	40.7	372.3	72.1	82.7
LnGrp LOS	F	C	D	F	D	D	F	D	D	F	F	F
Approach Vol, veh/h		666			852			1178			1706	
Approach Delay, s/veh		154.9			60.6			73.1			136.5	
Approach LOS		F			E			E			F	

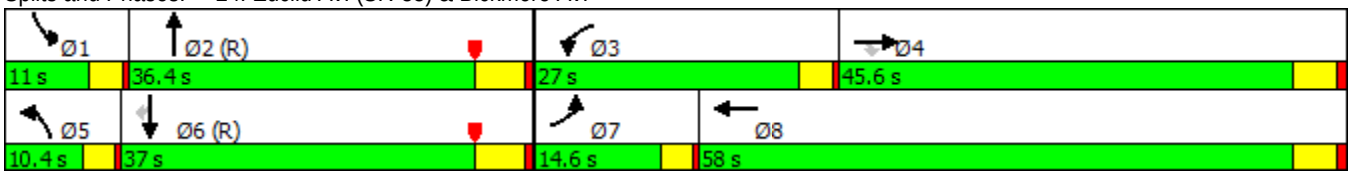
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	48.4	14.0	38.6	14.0	53.4	18.0	34.6
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	29.3	11.8	12.7	12.0	49.4	16.0	26.1
Green Ext Time (p_c), s	0.0	1.9	0.0	4.8	0.0	0.0	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	107.6
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	87	28	52	282	419	80	784	72	695	113
Future Volume (vph)	87	28	52	282	419	80	784	72	695	113
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.8	33.1	33.1	30.4	51.6	7.6	33.3	7.7	33.4	33.4
Actuated g/C Ratio	0.08	0.28	0.28	0.25	0.43	0.06	0.28	0.06	0.28	0.28
v/c Ratio	0.70	0.06	0.11	0.74	0.97	0.83	0.93	0.75	0.78	0.23
Control Delay	80.7	27.4	0.4	56.4	57.7	44.3	37.3	59.8	22.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.7	27.4	0.4	56.4	57.7	44.3	37.3	59.8	22.9	4.9
LOS	F	C	A	E	E	D	D	E	C	A
Approach Delay		46.9			57.4		37.9		23.6	
Approach LOS		D			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 40.5	Intersection LOS: D
Intersection Capacity Utilization 89.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	28	52	282	419	260	80	784	40	72	695	113
Future Volume (veh/h)	87	28	52	282	419	260	80	784	40	72	695	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	93	30	53	300	446	264	85	834	42	77	739	111
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	114	553	470	317	460	272	93	967	49	95	1003	449
Arrive On Green	0.07	0.31	0.31	0.20	0.43	0.43	0.02	0.10	0.10	0.04	0.20	0.20
Sat Flow, veh/h	1619	1800	1529	1619	1061	628	1619	3314	167	1619	3420	1530
Grp Volume(v), veh/h	93	30	53	300	0	710	85	430	446	77	739	111
Grp Sat Flow(s),veh/h/ln	1619	1800	1529	1619	0	1689	1619	1710	1771	1619	1710	1530
Q Serve(g_s), s	6.8	1.4	3.0	21.9	0.0	49.3	6.3	29.8	29.8	5.7	24.4	7.4
Cycle Q Clear(g_c), s	6.8	1.4	3.0	21.9	0.0	49.3	6.3	29.8	29.8	5.7	24.4	7.4
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	114	553	470	317	0	732	93	499	517	95	1003	449
V/C Ratio(X)	0.82	0.05	0.11	0.95	0.00	0.97	0.91	0.86	0.86	0.81	0.74	0.25
Avail Cap(c_a), veh/h	150	609	517	317	0	746	93	499	517	101	1003	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.0	29.3	29.8	47.6	0.0	33.3	58.6	51.8	51.8	57.0	43.9	37.0
Incr Delay (d2), s/veh	17.8	0.0	0.0	36.1	0.0	25.3	11.8	2.0	1.9	3.8	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.7	1.3	13.0	0.0	28.0	3.1	14.4	14.9	2.6	11.6	3.1
LnGrp Delay(d),s/veh	72.8	29.3	29.8	83.7	0.0	58.6	70.4	53.8	53.7	60.8	44.3	37.1
LnGrp LOS	E	C	C	F		E	E	D	D	E	D	D
Approach Vol, veh/h		176			1010			961			927	
Approach Delay, s/veh		52.4			66.1			55.2			44.8	
Approach LOS		D			E			E			D	

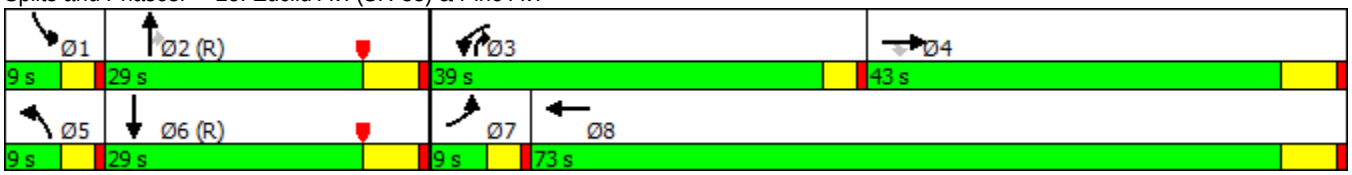
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	40.5	27.0	41.9	10.4	40.7	11.9	57.0
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	7.7	31.8	23.9	5.0	8.3	26.4	8.8	51.3
Green Ext Time (p_c), s	0.0	0.0	0.0	3.5	0.0	2.9	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	55.5
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	227	34	915	173	60	888	516	84	923
Future Volume (vph)	5	227	34	915	173	60	888	516	84	923
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	23.2	23.2	35.0	60.4	8.7	29.1	66.1	12.6	33.0
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.24	0.55	0.10	0.28
v/c Ratio	0.07	0.66	0.08	1.07	0.31	0.52	1.08	0.52	0.50	1.01
Control Delay	57.8	52.6	0.4	93.5	15.3	62.9	96.7	4.6	65.2	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.6	0.4	93.5	15.3	62.9	96.7	4.6	65.2	56.4
LOS	E	D	A	F	B	E	F	A	E	E
Approach Delay		46.1			75.7		62.8			57.1
Approach LOS		D			E		E			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 64.1	Intersection LOS: E
Intersection Capacity Utilization 91.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	227	34	915	173	95	60	888	516	84	923	15
Future Volume (veh/h)	5	227	34	915	173	95	60	888	516	84	923	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	229	0	924	175	81	61	897	343	85	932	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	303	257	862	526	243	67	1135	943	67	1150	12
Arrive On Green	0.01	0.17	0.00	0.29	0.45	0.45	0.04	0.33	0.33	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1160	537	1619	3420	1496	1619	3465	37
Grp Volume(v), veh/h	5	229	0	924	0	256	61	897	343	85	460	482
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1697	1619	1710	1496	1619	1710	1792
Q Serve(g_s), s	0.4	14.6	0.0	35.0	0.0	11.7	4.5	28.5	13.4	5.0	31.5	31.5
Cycle Q Clear(g_c), s	0.4	14.6	0.0	35.0	0.0	11.7	4.5	28.5	13.4	5.0	31.5	31.5
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	10	303	257	862	0	770	67	1135	943	67	567	595
V/C Ratio(X)	0.48	0.76	0.00	1.07	0.00	0.33	0.90	0.79	0.36	1.26	0.81	0.81
Avail Cap(c_a), veh/h	67	555	472	862	0	948	67	1135	943	67	567	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.26	0.26	0.26	0.61	0.61	0.61
Uniform Delay (d), s/veh	59.4	47.6	0.0	42.5	0.0	21.1	57.3	36.3	11.0	59.2	49.7	49.7
Incr Delay (d2), s/veh	12.4	5.4	0.0	51.7	0.0	0.4	31.1	1.5	0.3	170.7	7.5	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.7	0.0	20.4	0.0	5.6	2.6	13.7	5.6	5.4	16.1	16.9
LnGrp Delay(d),s/veh	71.8	53.0	0.0	94.2	0.0	21.5	88.4	37.8	11.3	229.8	57.3	57.0
LnGrp LOS	E	D		F		C	F	D	B	F	E	E
Approach Vol, veh/h		234			1180			1301			1027	
Approach Delay, s/veh		53.4			78.4			33.2			71.4	
Approach LOS		D			E			C			E	

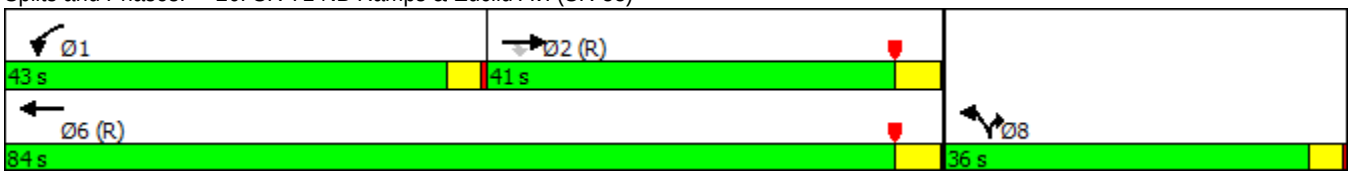
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	45.8	39.0	26.2	9.0	45.8	4.8	60.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	7.0	30.5	37.0	16.6	6.5	33.5	2.4	13.7
Green Ext Time (p_c), s	0.0	0.0	0.0	3.6	0.0	0.0	0.0	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	59.2
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	558	312	614	1250	75	942
Future Volume (vph)	558	312	614	1250	75	942
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	41.0	41.0	43.0	84.0	36.0	36.0
Total Split (%)	34.2%	34.2%	35.8%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	36.5	36.5	39.5	79.5	32.5	32.5
Actuated g/C Ratio	0.30	0.30	0.33	0.66	0.27	0.27
v/c Ratio	0.56	0.47	1.14	0.57	0.09	1.14
Control Delay	59.5	24.9	104.6	0.9	33.1	95.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	24.9	104.6	0.9	33.1	95.3
LOS	E	C	F	A	C	F
Approach Delay	47.1			35.1	90.7	
Approach LOS	D			D	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 52.9	Intersection LOS: D
Intersection Capacity Utilization 84.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	558	312	614	1250	75	942
Future Volume (veh/h)	558	312	614	1250	75	942
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	581	0	640	1302	78	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1824	816	564	3050	139	64
Arrive On Green	1.00	0.00	0.33	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	581	0	640	1302	78	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	39.5	8.0	2.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	39.5	8.0	2.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1824	816	564	3050	139	64
V/C Ratio(X)	0.32	0.00	1.13	0.43	0.56	0.00
Avail Cap(c_a), veh/h	1824	816	564	3050	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	40.3	1.1	56.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	62.7	0.0	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	28.5	3.6	1.3	0.0
LnGrp Delay(d),s/veh	0.5	0.0	103.0	1.2	60.0	0.0
LnGrp LOS	A		F	A	E	
Approach Vol, veh/h	581			1942	78	
Approach Delay, s/veh	0.5			34.7	60.0	
Approach LOS	A			C	E	

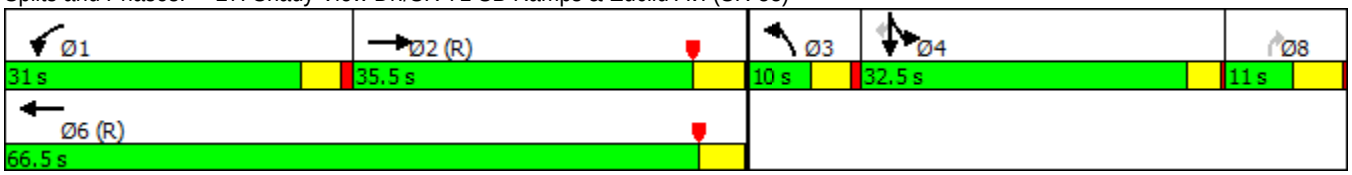
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	43.0	68.5				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	39.5	36.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	41.5	2.0				10.0		4.8
Green Ext Time (p_c), s	0.0	13.8				16.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	27.8
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	834	412	251	64	312	282	22	37
Future Volume (vph)	834	412	251	64	312	282	22	37
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	35.5	31.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	29.6%	25.8%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	30.5	35.0	70.5	5.5	7.4	19.1	19.1	19.1
Actuated g/C Ratio	0.25	0.29	0.59	0.05	0.06	0.16	0.16	0.16
v/c Ratio	1.08	0.96	0.14	0.95	0.82	0.68	0.64	0.11
Control Delay	96.1	74.9	3.7	147.9	22.8	61.0	57.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.1	74.9	3.7	147.9	22.8	61.0	57.5	0.6
LOS	F	E	A	F	C	E	E	A
Approach Delay	96.1		47.9				52.8	
Approach LOS	F		D				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 66.4	Intersection LOS: E
Intersection Capacity Utilization 77.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	834	17	412	251	0	64	0	312	282	22	37
Future Volume (veh/h)	0	834	17	412	251	0	64	0	312	282	22	37
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	916	19	453	276	0	70	0	343	327	0	41
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1874	39	358	2754	0	0	0	0	402	0	190
Arrive On Green	0.00	0.55	0.55	0.37	1.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Sat Flow, veh/h	0	3516	71	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	457	478	453	276	0		0.0		327	0	41
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	19.8	19.8	26.5	0.0	0.0				11.8	0.0	2.9
Cycle Q Clear(g_c), s	0.0	19.8	19.8	26.5	0.0	0.0				11.8	0.0	2.9
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	935	977	358	2754	0				402	0	190
V/C Ratio(X)	0.00	0.49	0.49	1.27	0.10	0.00				0.81	0.00	0.22
Avail Cap(c_a), veh/h	0	935	977	358	2754	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.8	16.8	37.9	0.0	0.0				51.2	0.0	47.3
Incr Delay (d2), s/veh	0.0	1.8	1.7	140.6	0.1	0.0				4.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.7	10.2	25.7	0.0	0.0				5.5	0.0	1.3
LnGrp Delay(d),s/veh	0.0	18.6	18.6	178.4	0.1	0.0				55.3	0.0	47.9
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		935			729						368	
Approach Delay, s/veh		18.6			110.9						54.4	
Approach LOS		B			F						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	31.0	70.6		18.4		101.6		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	26.5	30.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	28.5	21.8		13.8		2.0		
Green Ext Time (p_c), s	0.0	3.3		1.1		5.3		

Intersection Summary	
HCM 2010 Ctrl Delay	58.2
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	970	0	0	1396	0	0	0	0	1	0	0
Future Vol, veh/h	3	970	0	0	1396	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	1066	0	0	1534	0	0	0	0	1	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	1534	0	-	-	-	0				2607	2607	1534
Stage 1	-	-	-	-	-	-				1534	1534	-
Stage 2	-	-	-	-	-	-				1073	1073	-
Critical Hdwy	4.1	-	-	-	-	-				6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	439	-	0	0	-	-				27	25	145
Stage 1	-	-	0	0	-	-				198	180	-
Stage 2	-	-	0	0	-	-				331	299	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	439	-	-	-	-	-				27	0	145
Mov Cap-2 Maneuver	-	-	-	-	-	-				124	0	-
Stage 1	-	-	-	-	-	-				198	0	-
Stage 2	-	-	-	-	-	-				329	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	34.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	439	-	-	-	124
HCM Lane V/C Ratio	0.008	-	-	-	0.009
HCM Control Delay (s)	13.3	-	-	-	34.3
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	834	35	21	955	59	48
Future Vol, veh/h	834	35	21	955	59	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	869	36	22	995	61	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	905	0	1926	453
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	1039	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	760	-	67	559
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	344	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	760	-	65	559
Mov Cap-2 Maneuver	-	-	-	-	242	-
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	334	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	19.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	242	559	-	-	760	-
HCM Lane V/C Ratio	0.254	0.089	-	-	0.029	-
HCM Control Delay (s)	24.9	12.1	-	-	9.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.1	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	816	33	809	167	39
Future Volume (vph)	816	33	809	167	39
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	26.4	5.1	29.7	10.3	10.3
Actuated g/C Ratio	0.51	0.10	0.58	0.20	0.20
v/c Ratio	0.56	0.23	0.86	0.57	0.13
Control Delay	10.4	28.6	18.4	31.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	28.6	18.4	31.2	9.3
LOS	B	C	B	C	A
Approach Delay	10.4		18.8	27.1	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	816	66	33	809	167	39
Future Volume (veh/h)	816	66	33	809	167	39
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	897	73	36	889	184	40
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1544	126	63	1092	299	283
Arrive On Green	0.48	0.48	0.04	0.61	0.18	0.18
Sat Flow, veh/h	3287	260	1619	1800	1619	1530
Grp Volume(v), veh/h	480	490	36	889	184	40
Grp Sat Flow(s),veh/h/ln	1710	1747	1619	1800	1619	1530
Q Serve(g_s), s	10.9	10.9	1.2	20.8	5.7	1.2
Cycle Q Clear(g_c), s	10.9	10.9	1.2	20.8	5.7	1.2
Prop In Lane		0.15	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	826	844	63	1092	299	283
V/C Ratio(X)	0.58	0.58	0.58	0.81	0.62	0.14
Avail Cap(c_a), veh/h	919	939	150	1287	299	283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	10.1	25.6	8.3	20.3	18.5
Incr Delay (d2), s/veh	0.8	0.7	3.1	3.6	9.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	5.3	0.6	11.2	3.3	0.6
LnGrp Delay(d),s/veh	10.8	10.8	28.7	11.9	29.4	19.5
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	970			925	224	
Approach Delay, s/veh	10.8			12.5	27.7	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.7	32.3				39.0		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	3.2	12.9				22.8		7.7
Green Ext Time (p_c), s	0.0	10.2				10.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	741	72	611	232	83
Future Volume (vph)	741	72	611	232	83
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	21.7	5.4	29.2	13.8	13.8
Actuated g/C Ratio	0.40	0.10	0.54	0.26	0.26
v/c Ratio	0.74	0.50	0.71	0.64	0.23
Control Delay	18.0	38.8	13.4	30.0	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	38.8	13.4	30.0	18.0
LOS	B	D	B	C	B
Approach Delay	18.0		16.0	26.8	
Approach LOS	B		B	C	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 54.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 18.8		Intersection LOS: B	
Intersection Capacity Utilization 58.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	741	141	72	611	232	83
Future Volume (veh/h)	741	141	72	611	232	83
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	833	158	81	687	261	75
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1158	220	105	999	399	377
Arrive On Green	0.41	0.41	0.06	0.56	0.25	0.25
Sat Flow, veh/h	2945	542	1619	1800	1619	1530
Grp Volume(v), veh/h	499	492	81	687	261	75
Grp Sat Flow(s),veh/h/ln	1710	1687	1619	1800	1619	1530
Q Serve(g_s), s	13.3	13.3	2.7	14.9	7.9	2.1
Cycle Q Clear(g_c), s	13.3	13.3	2.7	14.9	7.9	2.1
Prop In Lane		0.32	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	693	684	105	999	399	377
V/C Ratio(X)	0.72	0.72	0.77	0.69	0.65	0.20
Avail Cap(c_a), veh/h	811	800	161	1185	399	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	13.6	25.0	8.7	18.4	16.2
Incr Delay (d2), s/veh	2.6	2.6	4.8	1.3	8.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.6	1.3	7.6	4.4	1.0
LnGrp Delay(d),s/veh	16.2	16.2	29.8	10.0	26.5	17.4
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	991			768	336	
Approach Delay, s/veh	16.2			12.1	24.5	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.1	28.3				36.4		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.7	15.3				16.9		9.9
Green Ext Time (p_c), s	0.0	6.7				9.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	77.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	400	413	12	5	471	126	20	20	18	97	13	193
Future Vol, veh/h	400	413	12	5	471	126	20	20	18	97	13	193
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	421	435	13	5	496	133	21	21	19	102	14	203

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	629	0	0	449	0	0	1966	1925	227	1645	1865	563
Stage 1	-	-	-	-	-	-	1285	1285	-	574	574	-
Stage 2	-	-	-	-	-	-	681	640	-	1071	1291	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	963	-	-	1122	-	-	43	68	782	~ 73	74	530
Stage 1	-	-	-	-	-	-	177	237	-	507	506	-
Stage 2	-	-	-	-	-	-	444	473	-	239	236	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	963	-	-	1121	-	-	~ 16	38	780	~ 30	41	529
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	44	-	~ 80	104	-
Stage 1	-	-	-	-	-	-	99	133	-	285	503	-
Stage 2	-	-	-	-	-	-	265	470	-	110	133	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.6	0.1	92.7	$ 422.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	96	963	-	-	1121	-	-	178
HCM Lane V/C Ratio	0.636	0.437	-	-	0.005	-	-	1.792
HCM Control Delay (s)	92.7	11.6	-	-	8.2	-	-	$ 422.6
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	3.1	2.3	-	-	0	-	-	22.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	403	16	26	526	8	59	0	22	2	0	16
Future Vol, veh/h	109	403	16	26	526	8	59	0	22	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	443	18	29	578	9	65	0	24	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	587	0	0	461	0	0	1338	1334	231	1098	1338	582
Stage 1	-	-	-	-	-	-	690	690	-	640	640	-
Stage 2	-	-	-	-	-	-	648	644	-	458	698	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	998	-	-	1111	-	-	122	155	777	181	154	517
Stage 1	-	-	-	-	-	-	406	449	-	467	473	-
Stage 2	-	-	-	-	-	-	462	471	-	557	445	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	998	-	-	1111	-	-	105	133	776	156	132	517
Mov Cap-2 Maneuver	-	-	-	-	-	-	245	273	-	156	132	-
Stage 1	-	-	-	-	-	-	358	396	-	412	461	-
Stage 2	-	-	-	-	-	-	435	459	-	476	392	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.4	21.9	14.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	301	998	-	-	1111	-	-	411
HCM Lane V/C Ratio	0.296	0.119	-	-	0.026	-	-	0.048
HCM Control Delay (s)	21.9	9.1	-	-	8.3	-	-	14.2
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.2	0.4	-	-	0.1	-	-	0.1

Intersection	
Intersection Delay, s/veh	30
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	232	0	196	0	0	0	0	0	298	473	0
Future Vol, veh/h	0	232	0	196	0	0	0	0	0	298	473	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	249	0	211	0	0	0	0	0	320	509	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	17.8	44
HCM LOS	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	298	473	232	196	123	260
LT Vol	298	0	232	0	0	0
Through Vol	0	473	0	0	123	0
RT Vol	0	0	0	196	0	260
Lane Flow Rate	320	509	249	211	132	280
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.655	0.967	0.564	0.404	0.275	0.525
Departure Headway (Hd)	7.359	6.847	8.132	6.905	7.485	6.765
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	493	534	447	523	480	534
Service Time	5.08	4.568	5.849	4.622	5.224	4.504
HCM Lane V/C Ratio	0.649	0.953	0.557	0.403	0.275	0.524
HCM Control Delay	23	57.3	20.9	14.2	13.1	16.8
HCM Lane LOS	C	F	C	B	B	C
HCM 95th-tile Q	4.7	12.7	3.4	1.9	1.1	3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

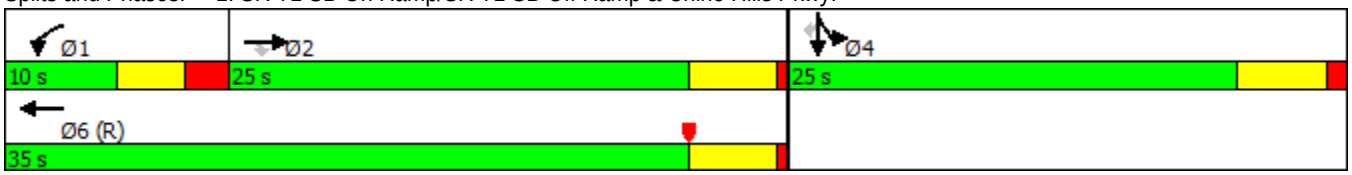
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↑	↱
Traffic Vol, veh/h	0	0	123	260
Future Vol, veh/h	0	0	123	260
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	132	280
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	15.6
HCM LOS	C

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1205	715	18	993	433	245	721
Future Volume (vph)	1205	715	18	993	433	245	721
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.43	0.78	0.14	0.60	0.69	0.65	1.29
Control Delay	11.7	13.2	37.6	9.5	25.9	23.4	164.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	13.2	37.6	9.5	25.9	23.4	164.0
LOS	B	B	D	A	C	C	F
Approach Delay	12.2			10.0		96.5	
Approach LOS	B			B		F	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.29	
Intersection Signal Delay: 38.9	Intersection LOS: D
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1205	715	18	993	0	0	0	0	433	245	721
Future Volume (veh/h)	0	1205	715	18	993	0	0	0	0	433	245	721
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1268	627	19	1045	0				357	397	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2492	607	37	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.05	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1268	627	19	1045	0				357	397	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	9.2	24.1	0.7	0.0	0.0				11.3	11.3	0.0
Cycle Q Clear(g_c), s	0.0	9.2	24.1	0.7	0.0	0.0				11.3	11.3	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2492	607	37	1739	0				540	600	510
V/C Ratio(X)	0.00	0.51	1.03	0.52	0.60	0.00				0.66	0.66	0.00
Avail Cap(c_a), veh/h	0	2492	607	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.75	0.75	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.5	17.9	28.3	0.0	0.0				17.1	17.1	0.0
Incr Delay (d2), s/veh	0.0	0.2	45.4	3.1	1.2	0.0				6.3	5.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	17.6	0.3	0.3	0.0				6.0	6.6	0.0
LnGrp Delay(d),s/veh	0.0	13.6	63.4	31.5	1.2	0.0				23.4	22.8	0.0
LnGrp LOS		B	F	C	A					C	C	
Approach Vol, veh/h		1895			1064						754	
Approach Delay, s/veh		30.1			1.7						23.0	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.4	28.6		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	26.1		13.3		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.6		22.4		

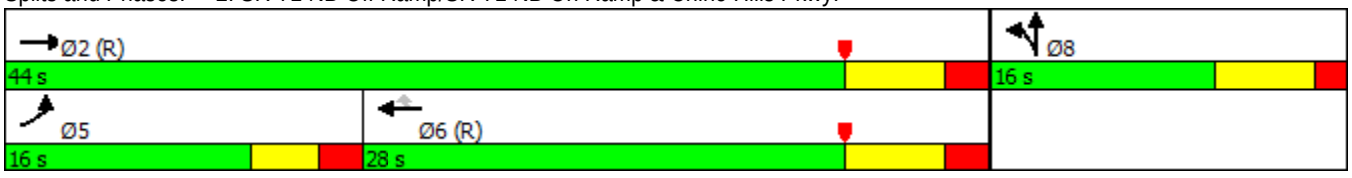
Intersection Summary	
HCM 2010 Ctrl Delay	20.5
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	427	1211	646	600	366	110
Future Volume (vph)	427	1211	646	600	366	110
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	37.5	21.5	21.5	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.85	0.61	0.57	0.94	0.80	0.60
Control Delay	40.3	9.7	17.7	37.7	51.6	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	9.7	17.7	37.7	51.6	28.4
LOS	D	A	B	D	D	C
Approach Delay		17.7	27.3			37.3
Approach LOS		B	C			D

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	427	1211	0	0	646	600	366	110	5	0	0	0
Future Volume (veh/h)	427	1211	0	0	646	600	366	110	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	459	1302	0	0	695	642	394	118	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	542	2138	0	0	1226	540	540	297	3			
Arrive On Green	0.18	0.63	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1782	15			
Grp Volume(v), veh/h	459	1302	0	0	695	642	394	0	119			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	9.0	13.8	0.0	0.0	9.8	21.5	6.9	0.0	3.5			
Cycle Q Clear(g_c), s	9.0	13.8	0.0	0.0	9.8	21.5	6.9	0.0	3.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	542	2138	0	0	1226	540	540	0	300			
V/C Ratio(X)	0.85	0.61	0.00	0.00	0.57	1.19	0.73	0.00	0.40			
Avail Cap(c_a), veh/h	542	2138	0	0	1226	540	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.49	0.49	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.7	6.8	0.0	0.0	15.5	19.3	23.7	0.0	22.3			
Incr Delay (d2), s/veh	10.5	1.1	0.0	0.0	0.9	93.8	8.4	0.0	3.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.4	6.7	0.0	0.0	4.8	22.9	3.7	0.0	2.1			
LnGrp Delay(d),s/veh	34.2	7.9	0.0	0.0	16.4	113.1	32.2	0.0	26.2			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1761			1337			513				
Approach Delay, s/veh		14.8			62.8			30.8				
Approach LOS		B			E			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			16.0	28.0		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		15.8			11.0	23.5		8.9
Green Ext Time (p_c), s		16.6			0.0	0.0		0.3

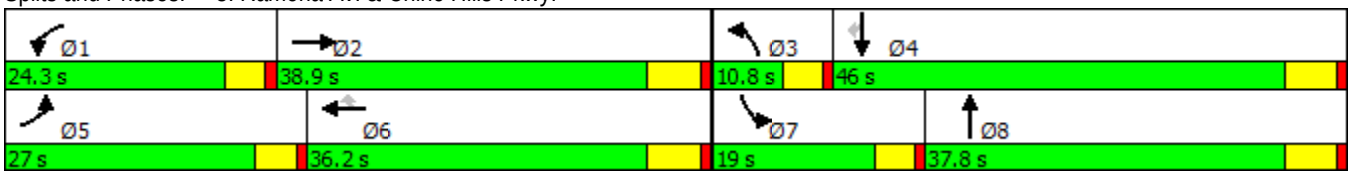
Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	266	948	148	790	139	23	307	166	482	433
Future Volume (vph)	266	948	148	790	139	23	307	166	482	433
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	22.0	37.0	15.4	30.4	30.4	5.8	32.0	14.2	44.4	44.4
Actuated g/C Ratio	0.18	0.31	0.13	0.25	0.25	0.05	0.27	0.12	0.37	0.37
v/c Ratio	0.95	0.66	0.76	0.97	0.30	0.31	0.53	0.92	0.40	0.55
Control Delay	90.2	39.0	72.2	67.6	7.0	65.7	34.5	100.4	30.0	5.6
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.2	39.4	72.2	67.6	7.0	65.7	34.5	100.4	30.0	5.6
LOS	F	D	E	E	A	E	C	F	C	A
Approach Delay		50.5		60.4			36.0		31.0	
Approach LOS		D		E			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 46.0	Intersection LOS: D
Intersection Capacity Utilization 93.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	948	2	148	790	139	23	307	145	166	482	433
Future Volume (veh/h)	266	948	2	148	790	139	23	307	145	166	482	433
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	283	1009	2	157	840	103	24	327	99	177	513	351
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	302	1660	3	182	866	382	37	690	205	194	1244	548
Arrive On Green	0.19	0.33	0.33	0.11	0.25	0.25	0.02	0.27	0.27	0.12	0.36	0.36
Sat Flow, veh/h	1619	5064	10	1619	3420	1509	1619	2589	770	1619	3420	1507
Grp Volume(v), veh/h	283	653	358	157	840	103	24	214	212	177	513	351
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1649	1619	1710	1507
Q Serve(g_s), s	20.7	20.1	20.1	11.4	29.2	6.6	1.8	12.6	13.0	13.0	13.5	23.2
Cycle Q Clear(g_c), s	20.7	20.1	20.1	11.4	29.2	6.6	1.8	12.6	13.0	13.0	13.5	23.2
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	302	1074	589	182	866	382	37	456	440	194	1244	548
V/C Ratio(X)	0.94	0.61	0.61	0.86	0.97	0.27	0.65	0.47	0.48	0.91	0.41	0.64
Avail Cap(c_a), veh/h	302	1074	589	266	866	382	84	456	440	194	1244	548
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.1	33.9	33.9	52.4	44.3	35.9	58.1	36.9	37.0	52.2	28.6	31.7
Incr Delay (d2), s/veh	34.9	1.2	2.1	12.9	23.4	0.5	6.8	3.4	3.7	39.8	1.0	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	9.2	10.3	5.8	16.6	2.8	0.9	6.4	6.3	7.9	6.5	10.4
LnGrp Delay(d),s/veh	83.0	35.0	36.0	65.2	67.7	36.4	64.9	40.3	40.8	92.0	29.6	37.3
LnGrp LOS	F	D	D	E	E	D	E	D	D	F	C	D
Approach Vol, veh/h		1294			1100			450			1041	
Approach Delay, s/veh		45.8			64.5			41.8			42.8	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.1	45.1	7.4	49.4	27.0	36.2	19.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	13.4	22.1	3.8	25.2	22.7	31.2	15.0	15.0
Green Ext Time (p_c), s	0.1	9.1	0.0	6.0	0.0	0.0	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	49.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	938	129	48	899	94	29
Future Vol, veh/h	938	129	48	899	94	29
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1042	143	53	999	104	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1045	0	1651	524
Stage 1	-	-	-	-	1045	-
Stage 2	-	-	-	-	606	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	673	-	~ 91	503
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	513	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	673	-	~ 84	502
Mov Cap-2 Maneuver	-	-	-	-	253	-
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	473	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	28.4
HCM LOS			D

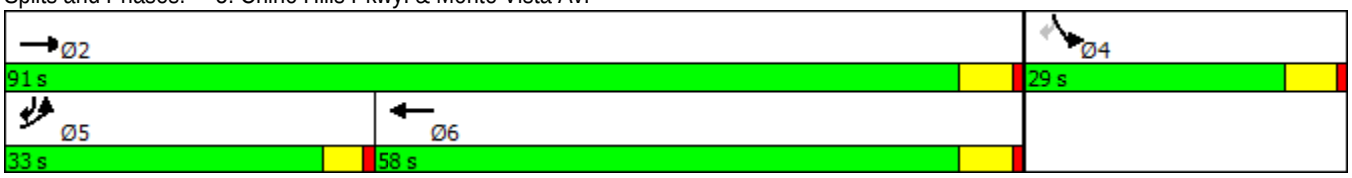
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	287	-	-	673	-
HCM Lane V/C Ratio	0.476	-	-	0.079	-
HCM Control Delay (s)	28.4	-	-	10.8	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.4	-	-	0.3	-

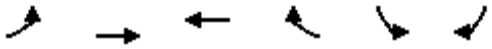
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	129	838	696	63	251
Future Volume (vph)	129	838	696	63	251
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	11.6	44.1	27.8	23.6	36.4
Actuated g/C Ratio	0.15	0.55	0.35	0.30	0.46
v/c Ratio	0.59	0.48	0.70	0.08	0.36
Control Delay	43.8	11.2	25.5	24.1	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	11.2	25.5	24.1	9.0
LOS	D	B	C	C	A
Approach Delay		15.6	25.5	12.0	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 79.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 18.7	Intersection LOS: B
Intersection Capacity Utilization 60.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	129	838	696	65	63	251
Future Volume (veh/h)	129	838	696	65	63	251
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	140	911	757	69	68	87
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	171	2033	1377	125	799	575
Arrive On Green	0.11	0.59	0.44	0.44	0.27	0.27
Sat Flow, veh/h	1619	3510	3253	288	2956	1530
Grp Volume(v), veh/h	140	911	409	417	68	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1742	1478	1530
Q Serve(g_s), s	7.3	12.6	15.2	15.3	1.5	3.2
Cycle Q Clear(g_c), s	7.3	12.6	15.2	15.3	1.5	3.2
Prop In Lane	1.00			0.17	1.00	1.00
Lane Grp Cap(c), veh/h	171	2033	744	758	799	575
V/C Ratio(X)	0.82	0.45	0.55	0.55	0.09	0.15
Avail Cap(c_a), veh/h	536	3395	1040	1059	799	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	9.6	18.0	18.0	23.4	17.7
Incr Delay (d2), s/veh	3.6	0.2	0.9	0.9	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	6.0	7.3	7.5	0.6	3.4
LnGrp Delay(d),s/veh	41.2	9.8	18.9	18.9	23.6	18.3
LnGrp LOS	D	A	B	B	C	B
Approach Vol, veh/h		1051	826		155	
Approach Delay, s/veh		14.0	18.9		20.6	
Approach LOS		B	B		C	

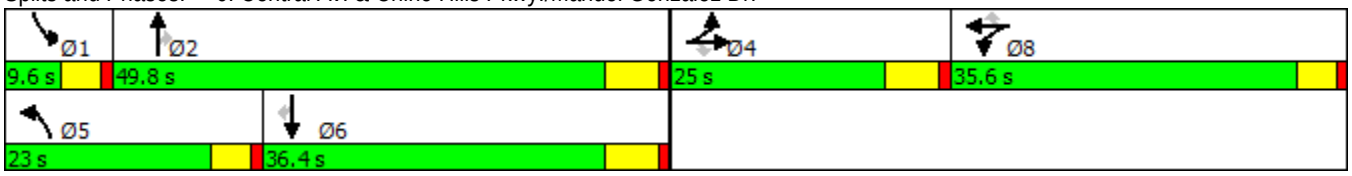
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		56.8		29.0	13.7	43.2		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		14.6		5.2	9.3	17.3		
Green Ext Time (p_c), s		27.5		0.4	0.1	20.1		

Intersection Summary	
HCM 2010 Ctrl Delay	16.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	2	427	12	43	35	325	777	1	11	877	240
Future Volume (vph)	514	2	427	12	43	35	325	777	1	11	877	240
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.94	0.89	0.69	0.06	0.19	0.11	1.18	0.47	0.00	0.15	0.90	0.46
Control Delay	81.7	71.9	10.1	37.7	40.4	0.7	147.3	19.0	0.0	54.5	47.4	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.7	71.9	10.1	37.7	40.4	0.7	147.3	19.0	0.0	54.5	47.4	16.3
LOS	F	E	B	D	D	A	F	B	A	D	D	B
Approach Delay		46.6			24.6			56.7			40.8	
Approach LOS		D			C			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 47.4	Intersection LOS: D
Intersection Capacity Utilization 81.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	514	2	427	12	43	35	325	777	1	11	877	240
Future Volume (veh/h)	514	2	427	12	43	35	325	777	1	11	877	240
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	560	0	336	13	47	21	353	845	1	12	953	191
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	631	0	298	156	174	147	302	1652	738	23	1062	469
Arrive On Green	0.19	0.00	0.19	0.10	0.10	0.10	0.19	0.48	0.48	0.01	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	560	0	336	13	47	21	353	845	1	12	953	191
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	16.6	0.0	19.2	0.7	2.4	1.2	18.4	16.7	0.0	0.7	26.2	9.8
Cycle Q Clear(g_c), s	16.6	0.0	19.2	0.7	2.4	1.2	18.4	16.7	0.0	0.7	26.2	9.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	631	0	298	156	174	147	302	1652	738	23	1062	469
V/C Ratio(X)	0.89	0.00	1.13	0.08	0.27	0.14	1.17	0.51	0.00	0.52	0.90	0.41
Avail Cap(c_a), veh/h	631	0	298	509	566	479	302	1652	738	82	1062	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	0.0	39.7	40.5	41.3	40.8	40.1	17.5	13.2	48.2	32.5	26.8
Incr Delay (d2), s/veh	14.4	0.0	90.8	0.2	0.8	0.4	105.1	1.1	0.0	6.6	11.8	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	0.0	15.6	0.3	1.2	0.5	17.0	8.1	0.0	0.4	14.0	4.4
LnGrp Delay(d),s/veh	53.0	0.0	130.5	40.8	42.1	41.2	145.1	18.6	13.2	54.9	44.2	29.4
LnGrp LOS	D		F	D	D	D	F	B	B	D	D	C
Approach Vol, veh/h		896			81			1199			1156	
Approach Delay, s/veh		82.1			41.7			55.9			41.9	
Approach LOS		F			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	53.4		25.0	23.0	36.4		14.1
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	18.7		21.2	20.4	28.2		4.4
Green Ext Time (p_c), s	0.0	18.4		0.0	0.0	2.2		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	57.7
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	27	5	750	4	471	9	595	848	588	738
Future Volume (vph)	27	5	750	4	471	9	595	848	588	738
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	28.1	28.1	71.5	5.0	23.8	23.8	37.6	64.1
Actuated g/C Ratio	0.09	0.09	0.24	0.24	0.61	0.04	0.20	0.20	0.32	0.55
v/c Ratio	0.20	0.17	1.06	1.01	0.48	0.13	0.89	1.11	1.18	0.29
Control Delay	55.2	26.0	108.2	93.8	8.6	59.8	62.7	82.4	137.5	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	26.0	108.2	93.8	8.6	59.8	62.7	82.4	137.5	15.5
LOS	E	C	F	F	A	E	E	F	F	B
Approach Delay		40.9		65.4			74.2			68.9
Approach LOS		D		E			E			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 117.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 69.4 — Intersection LOS: E
Intersection Capacity Utilization 112.8% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	5	21	750	4	471	9	595	848	588	738	18
Future Volume (veh/h)	27	5	21	750	4	471	9	595	848	588	738	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	28	5	13	784	0	340	9	620	707	612	769	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	107	29	76	770	0	851	18	688	303	515	2524	49
Arrive On Green	0.07	0.07	0.07	0.24	0.00	0.24	0.01	0.20	0.20	0.32	0.51	0.51
Sat Flow, veh/h	1619	443	1153	3238	0	1530	1619	3420	1508	1619	4960	97
Grp Volume(v), veh/h	28	0	18	784	0	340	9	620	707	612	508	276
Grp Sat Flow(s),veh/h/ln	1619	0	1597	1619	0	1530	1619	1710	1508	1619	1638	1781
Q Serve(g_s), s	1.9	0.0	1.3	28.0	0.0	14.9	0.7	20.8	23.7	37.5	10.6	10.6
Cycle Q Clear(g_c), s	1.9	0.0	1.3	28.0	0.0	14.9	0.7	20.8	23.7	37.5	10.6	10.6
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	107	0	105	770	0	851	18	688	303	515	1667	906
V/C Ratio(X)	0.26	0.00	0.17	1.02	0.00	0.40	0.51	0.90	2.33	1.19	0.30	0.31
Avail Cap(c_a), veh/h	137	0	136	770	0	851	69	688	303	515	1667	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	0.0	52.0	44.9	0.0	14.9	57.9	45.9	47.0	40.1	16.8	16.8
Incr Delay (d2), s/veh	0.5	0.0	0.3	37.1	0.0	0.3	8.4	17.2	608.9	102.5	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.6	16.4	0.0	6.3	0.3	11.5	61.1	31.3	4.9	5.4
LnGrp Delay(d),s/veh	52.7	0.0	52.2	82.0	0.0	15.2	66.3	63.1	655.9	142.6	17.3	17.7
LnGrp LOS	D		D	F		B	E	E	F	F	B	B
Approach Vol, veh/h		46			1124			1336			1396	
Approach Delay, s/veh		52.5			61.8			376.8			72.3	
Approach LOS		D			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.4	5.9	65.7		33.8
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.5	25.7		3.9	2.7	12.6		30.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	26.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		173.3
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1333	928	164
Future Volume (vph)	1333	928	164
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	84.7	84.7	25.8
Actuated g/C Ratio	0.71	0.71	0.22
v/c Ratio	0.54	0.28	1.07dr
Control Delay	5.9	7.2	52.3
Queue Delay	0.0	0.0	0.0
Total Delay	5.9	7.2	52.3
LOS	A	A	D
Approach Delay	5.9	7.2	52.3
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 62.3%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1333	397	0	928	164	355
Future Volume (veh/h)	1333	397	0	928	164	355
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1403	418	0	977	173	213
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2873	851	0	3751	255	241
Arrive On Green	1.00	1.00	0.00	0.76	0.16	0.16
Sat Flow, veh/h	3926	1115	0	5238	1619	1530
Grp Volume(v), veh/h	1220	601	0	977	173	213
Grp Sat Flow(s),veh/h/ln	1638	1603	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	7.0	12.1	16.4
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.0	12.1	16.4
Prop In Lane		0.70	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2501	1224	0	3751	255	241
V/C Ratio(X)	0.49	0.49	0.00	0.26	0.68	0.88
Avail Cap(c_a), veh/h	2501	1224	0	3751	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.2	47.7	49.5
Incr Delay (d2), s/veh	0.7	1.4	0.0	0.2	1.2	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.0	3.2	5.5	7.2
LnGrp Delay(d),s/veh	0.7	1.4	0.0	4.4	48.9	53.7
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1821			977	386	
Approach Delay, s/veh	0.9			4.4	51.5	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		96.1				96.1		23.9
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				9.0		18.4
Green Ext Time (p_c), s		23.4				22.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.1
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	744	91	730	985	0
Future Volume (vph)	744	91	730	985	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	31.1	31.1	31.1	80.9	80.9
Actuated g/C Ratio	0.26	0.26	0.26	0.67	0.67
v/c Ratio	0.59	0.20	0.86	0.87	0.92
Control Delay	41.3	8.2	45.4	26.1	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	8.2	45.4	26.1	32.5
LOS	D	A	D	C	C
Approach Delay	37.7		45.4		29.3
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 35.9	Intersection LOS: D
Intersection Capacity Utilization 85.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	744	91	0	730	363	0	0	0	985	0	813
Future Volume (veh/h)	0	744	91	0	730	363	0	0	0	985	0	813
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	752	0	0	737	367				845	210	695
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1648	513	0	1099	513				968	220	728
Arrive On Green	0.00	0.34	0.00	0.00	0.11	0.11				0.60	0.60	0.60
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	368	1217
Grp Volume(v), veh/h	0	752	0	0	737	367				845	0	905
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1585
Q Serve(g_s), s	0.0	14.4	0.0	0.0	25.9	27.8				52.7	0.0	64.2
Cycle Q Clear(g_c), s	0.0	14.4	0.0	0.0	25.9	27.8				52.7	0.0	64.2
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.77
Lane Grp Cap(c), veh/h	0	1648	513	0	1099	513				968	0	948
V/C Ratio(X)	0.00	0.46	0.00	0.00	0.67	0.72				0.87	0.00	0.95
Avail Cap(c_a), veh/h	0	1648	513	0	1099	513				1100	0	1077
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.3	0.0	0.0	47.0	47.8				20.3	0.0	22.6
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.0	3.3	8.3				6.6	0.0	15.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.7	0.0	0.0	12.3	13.0				25.0	0.0	32.1
LnGrp Delay(d),s/veh	0.0	32.2	0.0	0.0	50.3	56.1				26.9	0.0	38.5
LnGrp LOS		C			D	E				C		D
Approach Vol, veh/h		752			1104						1750	
Approach Delay, s/veh		32.2			52.2						32.9	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		44.8		75.2		44.8		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		16.4		66.2		29.8		
Green Ext Time (p_c), s		8.2		5.5		0.6		

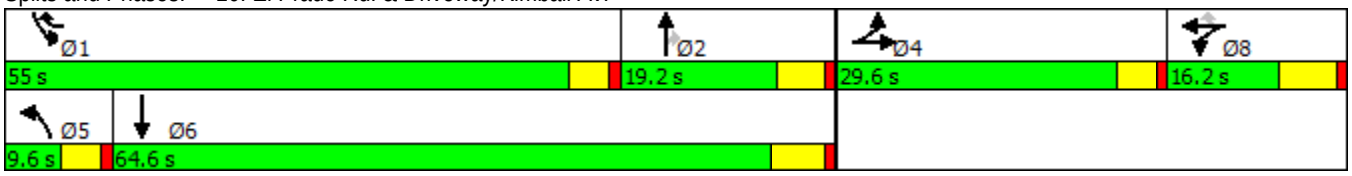
Intersection Summary	
HCM 2010 Ctrl Delay	38.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	37	9	3	855	4	210	25	1011	366
Future Volume (vph)	37	9	3	855	4	210	25	1011	366
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.18	0.08	0.15	0.76	0.05	0.81	0.07	1.20	0.18
Control Delay	42.9	29.4	48.4	9.8	53.2	66.3	0.4	127.4	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	29.4	48.4	9.8	53.2	66.3	0.4	127.4	10.8
LOS	D	C	D	A	D	E	A	F	B
Approach Delay		38.6	10.9			59.2			95.6
Approach LOS		D	B			E			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 61.9	Intersection LOS: E
Intersection Capacity Utilization 95.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	9	9	24	3	855	4	210	25	1011	366	14
Future Volume (veh/h)	37	9	9	24	3	855	4	210	25	1011	366	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	39	9	7	25	3	449	4	221	25	1064	385	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	124	72	56	149	18	892	78	243	207	788	1931	70
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.05	0.14	0.14	0.49	0.57	0.57
Sat Flow, veh/h	1619	940	731	1538	185	1530	1619	1800	1530	1619	3366	122
Grp Volume(v), veh/h	39	0	16	28	0	449	4	221	25	1064	195	204
Grp Sat Flow(s),veh/h/ln	1619	0	1671	1723	0	1530	1619	1800	1530	1619	1710	1778
Q Serve(g_s), s	2.4	0.0	0.9	1.5	0.0	10.0	0.2	12.5	1.5	50.4	5.7	5.7
Cycle Q Clear(g_c), s	2.4	0.0	0.9	1.5	0.0	10.0	0.2	12.5	1.5	50.4	5.7	5.7
Prop In Lane	1.00		0.44	0.89		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	124	0	128	166	0	892	78	243	207	788	981	1020
V/C Ratio(X)	0.31	0.00	0.12	0.17	0.00	0.50	0.05	0.91	0.12	1.35	0.20	0.20
Avail Cap(c_a), veh/h	391	0	403	166	0	892	78	243	207	788	981	1020
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	44.6	43.0	0.0	12.7	47.0	44.1	39.4	26.6	10.6	10.6
Incr Delay (d2), s/veh	1.4	0.0	0.4	0.5	0.0	0.5	0.1	34.2	0.3	165.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.4	0.8	0.0	7.6	0.1	8.6	0.6	58.7	2.7	2.8
LnGrp Delay(d),s/veh	46.6	0.0	45.0	43.4	0.0	13.2	47.1	78.4	39.6	192.5	10.7	10.7
LnGrp LOS	D		D	D		B	D	E	D	F	B	B
Approach Vol, veh/h		55			477			250			1463	
Approach Delay, s/veh		46.2			14.9			74.0			142.9	
Approach LOS		D			B			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.8		12.5	9.6	65.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	14.5		4.4	2.2	7.7		12.0
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	3.7		0.0

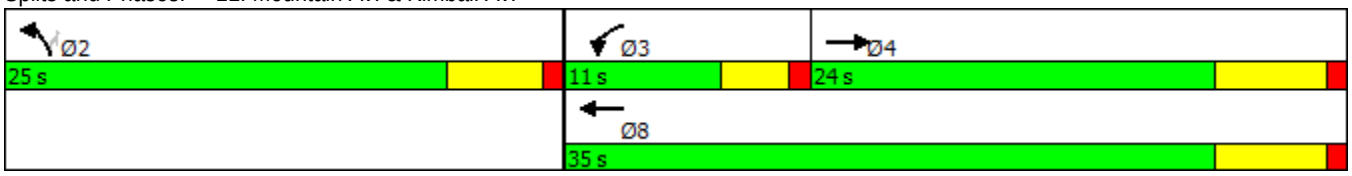
Intersection Summary	
HCM 2010 Ctrl Delay	105.7
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1047	50	729	150	145
Future Volume (vph)	1047	50	729	150	145
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	18.7	7.3	22.3	10.0	10.0
Actuated g/C Ratio	0.42	0.17	0.51	0.23	0.23
v/c Ratio	0.87	0.21	0.46	0.45	0.34
Control Delay	24.8	22.0	8.4	19.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	22.0	8.4	19.8	5.7
LOS	C	C	A	B	A
Approach Delay	24.8		9.2	12.9	
Approach LOS	C		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 61.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1047	94	50	729	150	145
Future Volume (veh/h)	1047	94	50	729	150	145
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1151	101	55	801	165	136
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1293	113	127	1973	262	248
Arrive On Green	0.41	0.41	0.08	0.58	0.16	0.16
Sat Flow, veh/h	3272	279	1619	3510	1619	1530
Grp Volume(v), veh/h	618	634	55	801	165	136
Grp Sat Flow(s),veh/h/ln	1710	1751	1619	1710	1619	1530
Q Serve(g_s), s	14.5	14.6	1.4	5.6	4.1	3.5
Cycle Q Clear(g_c), s	14.5	14.6	1.4	5.6	4.1	3.5
Prop In Lane		0.16	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	695	711	127	1973	262	248
V/C Ratio(X)	0.89	0.89	0.43	0.41	0.63	0.55
Avail Cap(c_a), veh/h	711	728	262	2293	737	697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	12.0	19.0	5.1	16.9	16.7
Incr Delay (d2), s/veh	12.6	12.6	0.9	0.0	0.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	9.4	0.7	2.6	1.9	1.5
LnGrp Delay(d),s/veh	24.5	24.5	19.9	5.1	17.9	17.4
LnGrp LOS	C	C	B	A	B	B
Approach Vol, veh/h	1252			856	301	
Approach Delay, s/veh	24.5			6.1	17.6	
Approach LOS	C			A	B	

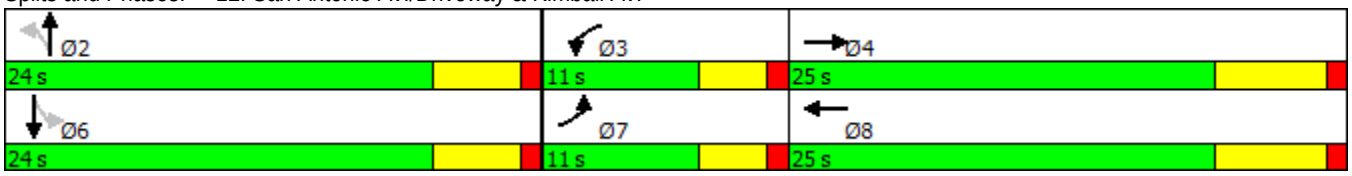
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	7.4	23.6				31.0
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		6.1	3.4	16.6				7.6
Green Ext Time (p_c), s		0.2	0.0	1.0				6.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	25	1147	15	712	66	0	76	0
Future Volume (vph)	25	1147	15	712	66	0	76	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	25.0	11.0	25.0	24.0	24.0	24.0	24.0
Total Split (%)	18.3%	41.7%	18.3%	41.7%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	19.7	7.2	19.7	9.1	9.1	9.1	9.1
Actuated g/C Ratio	0.17	0.47	0.17	0.47	0.22	0.22	0.22	0.22
v/c Ratio	0.09	0.78	0.06	0.47	0.25	0.03	0.29	0.02
Control Delay	19.0	17.3	18.8	10.5	16.3	0.1	17.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	17.3	18.8	10.5	16.3	0.1	17.0	0.0
LOS	B	B	B	B	B	A	B	A
Approach Delay		17.3		10.7		12.8		15.2
Approach LOS		B		B		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 41.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 55.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1147	43	15	712	12	66	0	18	76	0	9
Future Volume (veh/h)	25	1147	43	15	712	12	66	0	18	76	0	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	1207	45	16	749	13	69	0	17	80	0	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	1440	54	46	1419	25	406	0	266	399	0	266
Arrive On Green	0.04	0.43	0.43	0.03	0.41	0.41	0.17	0.00	0.17	0.17	0.00	0.17
Sat Flow, veh/h	1619	3363	125	1619	3438	60	1349	0	1530	1339	0	1530
Grp Volume(v), veh/h	26	613	639	16	372	390	69	0	17	80	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1778	1619	1710	1788	1349	0	1530	1339	0	1530
Q Serve(g_s), s	0.6	12.9	12.9	0.4	6.6	6.6	1.8	0.0	0.4	2.1	0.0	0.2
Cycle Q Clear(g_c), s	0.6	12.9	12.9	0.4	6.6	6.6	2.0	0.0	0.4	2.5	0.0	0.2
Prop In Lane	1.00		0.07	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	732	761	46	706	738	406	0	266	399	0	266
V/C Ratio(X)	0.37	0.84	0.84	0.35	0.53	0.53	0.17	0.00	0.06	0.20	0.00	0.03
Avail Cap(c_a), veh/h	281	806	838	281	806	843	811	0	725	801	0	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	10.3	10.3	19.2	8.9	8.9	14.7	0.0	13.9	15.0	0.0	13.8
Incr Delay (d2), s/veh	1.2	6.5	6.4	1.6	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.3	7.6	0.2	3.1	3.3	0.7	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	19.9	16.8	16.6	20.9	9.1	9.1	14.7	0.0	14.0	15.1	0.0	13.9
LnGrp LOS	B	B	B	C	A	A	B		B	B		B
Approach Vol, veh/h		1278			778			86			89	
Approach Delay, s/veh		16.8			9.3			14.6			14.9	
Approach LOS		B			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.1	23.3		11.9	5.8	22.6
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		4.0	2.4	14.9		4.5	2.6	8.6
Green Ext Time (p_c), s		0.2	0.0	2.3		0.2	0.0	4.3

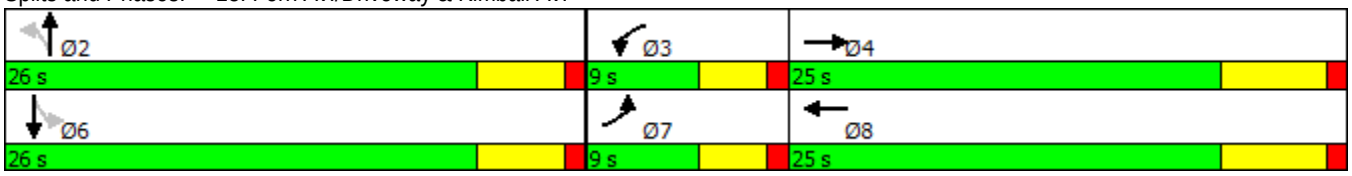
Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1213	12	652	49	1	191	8
Future Volume (vph)	20	1213	12	652	49	1	191	8
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	19.9	5.2	19.9	11.5	11.5	11.5	11.5
Actuated g/C Ratio	0.12	0.46	0.12	0.46	0.26	0.26	0.26	0.26
v/c Ratio	0.12	0.90	0.07	0.48	0.17	0.11	0.67	0.11
Control Delay	22.9	25.0	22.3	11.6	13.7	5.5	25.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	25.0	22.3	11.6	13.7	5.5	25.3	6.6
LOS	C	C	C	B	B	A	C	A
Approach Delay		25.0		11.8		10.0		21.9
Approach LOS		C		B		B		C

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 43.7
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 20.1 — Intersection LOS: C
Intersection Capacity Utilization 63.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1213	22	12	652	11	49	1	40	191	8	35
Future Volume (veh/h)	20	1213	22	12	652	11	49	1	40	191	8	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	23	1378	19	14	741	12	56	1	25	217	9	22
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	45	1491	21	29	1453	24	434	13	327	438	103	251
Arrive On Green	0.03	0.43	0.43	0.02	0.42	0.42	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1619	3453	48	1619	3443	56	1322	59	1480	1328	464	1135
Grp Volume(v), veh/h	23	682	715	14	368	385	56	0	26	217	0	31
Grp Sat Flow(s),veh/h/ln	1619	1710	1790	1619	1710	1789	1322	0	1539	1328	0	1600
Q Serve(g_s), s	0.6	16.7	16.8	0.4	7.0	7.0	1.6	0.0	0.6	6.9	0.0	0.7
Cycle Q Clear(g_c), s	0.6	16.7	16.8	0.4	7.0	7.0	2.2	0.0	0.6	7.5	0.0	0.7
Prop In Lane	1.00		0.03	1.00		0.03	1.00		0.96	1.00		0.71
Lane Grp Cap(c), veh/h	45	738	773	29	721	755	434	0	340	438	0	354
V/C Ratio(X)	0.51	0.92	0.92	0.48	0.51	0.51	0.13	0.00	0.08	0.50	0.00	0.09
Avail Cap(c_a), veh/h	183	744	779	183	744	778	771	0	732	777	0	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	11.9	11.9	21.6	9.4	9.4	14.6	0.0	13.7	16.6	0.0	13.7
Incr Delay (d2), s/veh	3.3	16.8	16.3	4.6	0.2	0.2	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	11.2	11.7	0.2	3.3	3.5	0.6	0.0	0.3	2.5	0.0	0.3
LnGrp Delay(d),s/veh	24.6	28.7	28.3	26.2	9.7	9.6	14.7	0.0	13.7	17.0	0.0	13.8
LnGrp LOS	C	C	C	C	A	A	B		B	B		B
Approach Vol, veh/h		1420			767			82			248	
Approach Delay, s/veh		28.4			9.9			14.4			16.6	
Approach LOS		C			A			B			B	

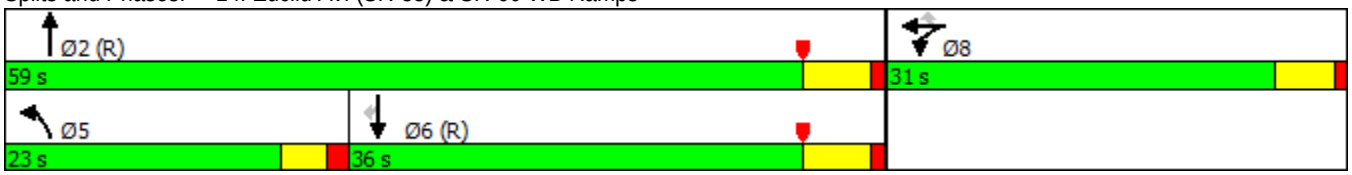
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.7	4.8	24.9		14.7	5.2	24.4
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		4.2	2.4	18.8		9.5	2.6	9.0
Green Ext Time (p_c), s		0.4	0.0	0.4		0.4	0.0	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	21.2
HCM 2010 LOS	C

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	651	6	431	533	1094	964	560
Future Volume (vph)	651	6	431	533	1094	964	560
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	25.0	25.0	25.0	19.5	54.5	30.5	30.5
Actuated g/C Ratio	0.28	0.28	0.28	0.22	0.61	0.34	0.34
v/c Ratio	0.93	0.90	0.78	1.60	0.56	0.88	0.66
Control Delay	62.9	55.1	35.8	297.1	23.0	38.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	4.2	0.0	0.0
Total Delay	62.9	55.1	35.8	297.1	27.1	38.1	6.2
LOS	E	E	D	F	C	D	A
Approach Delay		51.8			115.6	26.4	
Approach LOS		D			F	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.60	
Intersection Signal Delay: 67.1	Intersection LOS: E
Intersection Capacity Utilization 112.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	651	6	431	533	1094	0	0	964	560
Future Volume (veh/h)	0	0	0	651	6	431	533	1094	0	0	964	560
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				781	0	202	561	1152	0	0	1015	589
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				857	0	400	333	2116	0	0	1242	537
Arrive On Green				0.26	0.00	0.26	0.41	1.00	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1480
Grp Volume(v), veh/h				781	0	202	561	1152	0	0	1015	589
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1480
Q Serve(g_s), s				21.0	0.0	10.2	18.5	0.0	0.0	0.0	24.2	32.7
Cycle Q Clear(g_c), s				21.0	0.0	10.2	18.5	0.0	0.0	0.0	24.2	32.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				857	0	400	333	2116	0	0	1242	537
V/C Ratio(X)				0.91	0.00	0.51	1.69	0.54	0.00	0.00	0.82	1.10
Avail Cap(c_a), veh/h				935	0	436	333	2116	0	0	1242	537
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.1	0.0	28.1	26.5	0.0	0.0	0.0	26.0	28.7
Incr Delay (d2), s/veh				11.6	0.0	0.4	309.7	0.1	0.0	0.0	6.0	67.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.7	0.0	4.3	36.8	0.0	0.0	0.0	12.5	23.4
LnGrp Delay(d),s/veh				43.7	0.0	28.5	336.2	0.1	0.0	0.0	32.0	96.3
LnGrp LOS				D		C	F	A			C	F
Approach Vol, veh/h					983			1713			1604	
Approach Delay, s/veh					40.5			110.2			55.6	
Approach LOS					D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.2			23.0	38.2		28.8
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			20.5	34.7		23.0
Green Ext Time (p_c), s		41.7			0.0	0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	73.9
HCM 2010 LOS	E

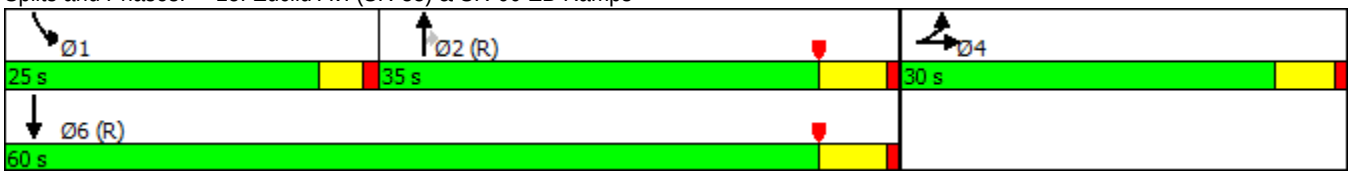
Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	400	2	1229	770	319	1297
Future Volume (vph)	400	2	1229	770	319	1297
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	25.0	25.0	30.5	30.5	20.0	54.5
Actuated g/C Ratio	0.28	0.28	0.34	0.34	0.22	0.61
v/c Ratio	0.86	1.37	1.08	0.84	0.91	0.64
Control Delay	52.4	206.6	82.8	14.4	52.6	5.4
Queue Delay	46.2	2.0	0.0	0.0	0.0	1.1
Total Delay	98.6	208.6	82.8	14.4	52.6	6.5
LOS	F	F	F	B	D	A
Approach Delay		167.4	56.4			15.6
Approach LOS		F	E			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.37
Intersection Signal Delay: 65.3 — Intersection LOS: E
Intersection Capacity Utilization 112.6% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	2	559	0	0	0	0	1229	770	319	1297	0
Future Volume (veh/h)	400	2	559	0	0	0	0	1229	770	319	1297	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	408	2	493				0	1254	786	326	1323	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	450	2	424				0	1172	509	353	2071	0
Arrive On Green	0.28	0.28	0.28				0.00	0.34	0.34	0.29	0.81	0.00
Sat Flow, veh/h	1619	6	1525				0	3510	1484	1619	3510	0
Grp Volume(v), veh/h	408	0	495				0	1254	786	326	1323	0
Grp Sat Flow(s),veh/h/ln	1619	0	1531				0	1710	1484	1619	1710	0
Q Serve(g_s), s	21.9	0.0	25.0				0.0	30.9	30.9	17.6	14.0	0.0
Cycle Q Clear(g_c), s	21.9	0.0	25.0				0.0	30.9	30.9	17.6	14.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	450	0	425				0	1172	509	353	2071	0
V/C Ratio(X)	0.91	0.00	1.16				0.00	1.07	1.55	0.92	0.64	0.00
Avail Cap(c_a), veh/h	450	0	425				0	1172	509	378	2071	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.57	0.57	0.33	0.33	0.00
Uniform Delay (d), s/veh	31.4	0.0	32.5				0.0	29.6	29.6	31.2	4.8	0.0
Incr Delay (d2), s/veh	21.4	0.0	96.7				0.0	41.5	251.1	11.3	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	0.0	21.9				0.0	21.2	48.0	8.9	6.4	0.0
LnGrp Delay(d),s/veh	52.8	0.0	129.2				0.0	71.0	280.6	42.5	5.3	0.0
LnGrp LOS	D		F					F	F	D	A	
Approach Vol, veh/h		903						2040			1649	
Approach Delay, s/veh		94.7						151.8			12.7	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.6	36.4		30.0		60.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	19.6	32.9		27.0		16.0		
Green Ext Time (p_c), s	0.1	0.0		0.0		36.1		

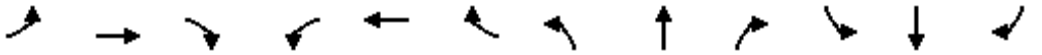
Intersection Summary	
HCM 2010 Ctrl Delay	90.6
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	128	333	101	290	135	1657	67	338	1366	143
Future Volume (vph)	128	333	101	290	135	1657	67	338	1366	143
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	45.0	45.0	45.0	45.0	13.0	57.0	57.0	18.0	62.0	62.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	10.8%	47.5%	47.5%	15.0%	51.7%	51.7%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	27.2	27.2	28.2	28.2	17.6	57.1	57.1	19.6	59.5	59.5
Actuated g/C Ratio	0.23	0.23	0.24	0.24	0.15	0.48	0.48	0.16	0.50	0.50
v/c Ratio	0.99	0.64	0.86	0.54	0.59	0.74	0.09	0.73	0.58	0.18
Control Delay	119.1	39.3	93.3	35.5	69.7	7.4	0.0	58.1	23.0	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.1	39.3	93.3	35.5	69.7	7.4	0.0	58.1	23.0	3.3
LOS	F	D	F	D	E	A	A	E	C	A
Approach Delay		56.0		46.7		11.7			27.9	
Approach LOS		E		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 86.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	333	149	101	290	127	135	1657	67	338	1366	143
Future Volume (veh/h)	128	333	149	101	290	127	135	1657	67	338	1366	143
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	133	347	124	105	302	111	141	1726	47	352	1423	90
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	232	709	249	209	705	254	109	2292	704	333	2497	776
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.14	0.93	0.93	0.11	0.51	0.51
Sat Flow, veh/h	930	2472	868	884	2459	884	1619	4914	1508	2956	4914	1526
Grp Volume(v), veh/h	133	238	233	105	208	205	141	1726	47	352	1423	90
Grp Sat Flow(s),veh/h/ln	930	1710	1631	884	1710	1633	1619	1638	1508	1478	1638	1526
Q Serve(g_s), s	16.3	13.8	14.3	13.4	11.9	12.3	8.1	9.5	0.3	13.5	24.1	3.7
Cycle Q Clear(g_c), s	28.6	13.8	14.3	27.7	11.9	12.3	8.1	9.5	0.3	13.5	24.1	3.7
Prop In Lane	1.00		0.53	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	491	468	209	491	469	109	2292	704	333	2497	776
V/C Ratio(X)	0.57	0.49	0.50	0.50	0.42	0.44	1.29	0.75	0.07	1.06	0.57	0.12
Avail Cap(c_a), veh/h	265	551	526	248	566	540	109	2292	704	333	2497	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.73	0.73	0.73
Uniform Delay (d), s/veh	46.6	35.4	35.6	47.1	34.7	34.9	51.9	2.5	2.2	53.2	20.4	15.4
Incr Delay (d2), s/veh	2.3	0.7	0.8	1.9	0.6	0.6	136.9	0.2	0.0	58.4	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	6.6	6.5	3.4	5.7	5.6	7.7	3.5	0.1	8.2	11.0	1.6
LnGrp Delay(d),s/veh	48.8	36.2	36.4	49.0	35.3	35.5	188.8	2.7	2.2	111.6	21.1	15.7
LnGrp LOS	D	D	D	D	D	D	F	A	A	F	C	B
Approach Vol, veh/h		604			518			1914			1865	
Approach Delay, s/veh		39.1			38.2			16.4			37.9	
Approach LOS		D			D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	61.3		40.7	13.0	66.3		40.7
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	13.5	51.7		38.7	8.1	* 58		* 40
Max Q Clear Time (g_c+I1), s	15.5	11.5		30.6	10.1	26.1		29.7
Green Ext Time (p_c), s	0.0	30.3		3.8	0.0	25.0		4.4

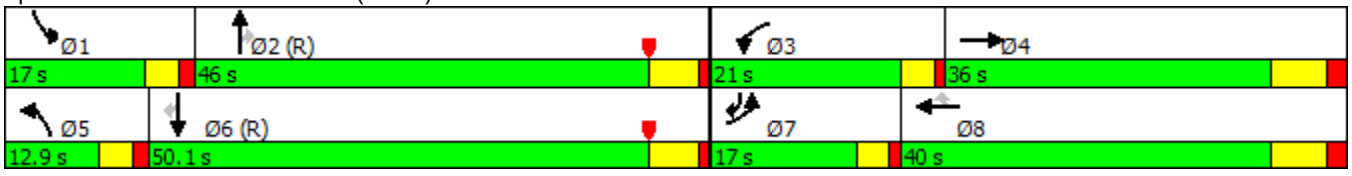
Intersection Summary			
HCM 2010 Ctrl Delay		29.7	
HCM 2010 LOS		C	

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	155	399	181	358	57	110	1533	284	135	1210	172
Future Volume (vph)	155	399	181	358	57	110	1533	284	135	1210	172
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.0	24.7	16.3	27.9	27.9	12.1	44.1	44.1	14.0	46.0	60.5
Actuated g/C Ratio	0.11	0.21	0.14	0.23	0.23	0.10	0.37	0.37	0.12	0.38	0.50
v/c Ratio	0.96	0.75	0.89	0.48	0.14	0.72	1.31	0.45	0.78	0.99	0.22
Control Delay	112.1	49.9	90.0	41.2	2.4	57.5	183.2	27.3	60.7	62.6	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.1	49.9	90.0	41.2	2.4	57.5	183.2	27.3	60.7	62.6	14.7
LOS	F	D	F	D	A	E	F	C	E	E	B
Approach Delay		64.9		52.4			153.1			57.0	
Approach LOS		E		D			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 97.0	Intersection LOS: F
Intersection Capacity Utilization 96.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	399	92	181	358	57	110	1533	284	135	1210	172
Future Volume (veh/h)	155	399	92	181	358	57	110	1533	284	135	1210	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	167	429	65	195	385	61	118	1648	174	145	1301	87
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	581	88	219	758	334	113	1336	598	169	1453	806
Arrive On Green	0.11	0.19	0.19	0.14	0.22	0.22	0.02	0.13	0.13	0.03	0.14	0.14
Sat Flow, veh/h	1619	2982	449	1619	3420	1507	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	167	245	249	195	385	61	118	1648	174	145	1301	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1721	1619	1710	1507	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	12.3	16.1	16.4	14.2	11.8	3.9	8.4	46.9	12.4	10.7	44.9	4.9
Cycle Q Clear(g_c), s	12.3	16.1	16.4	14.2	11.8	3.9	8.4	46.9	12.4	10.7	44.9	4.9
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	333	336	219	758	334	113	1336	598	169	1453	806
V/C Ratio(X)	0.95	0.73	0.74	0.89	0.51	0.18	1.04	1.23	0.29	0.86	0.90	0.11
Avail Cap(c_a), veh/h	175	413	416	229	941	414	113	1336	598	169	1453	806
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.44	0.44	0.44	0.76	0.76	0.76
Uniform Delay (d), s/veh	53.2	45.4	45.5	51.0	41.0	37.9	58.6	52.3	37.2	57.1	49.0	21.3
Incr Delay (d2), s/veh	53.5	6.2	6.5	30.3	0.8	0.4	67.1	108.0	0.5	27.3	7.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	8.2	8.4	8.2	5.7	1.7	5.9	42.3	5.3	6.1	22.7	2.1
LnGrp Delay(d),s/veh	106.7	51.6	52.0	81.3	41.7	38.2	126.3	160.2	37.8	84.3	56.0	21.5
LnGrp LOS	F	D	D	F	D	D	F	F	D	F	E	C
Approach Vol, veh/h		661			641			1940			1533	
Approach Delay, s/veh		65.6			53.4			147.2			56.7	
Approach LOS		E			D			F			E	

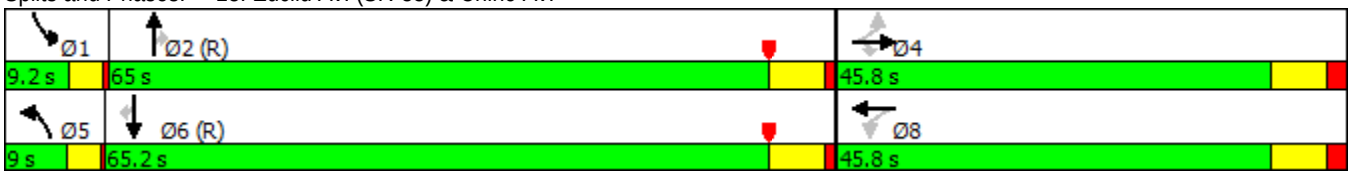
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	52.4	20.2	30.4	12.9	56.5	17.0	33.6
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	12.7	48.9	16.2	18.4	10.4	46.9	14.3	13.8
Green Ext Time (p_c), s	0.0	0.0	0.0	5.0	0.0	0.0	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	94.3
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	72	180	50	75	100	63	1874	217	16	1354	65
Future Volume (vph)	72	180	50	75	100	63	1874	217	16	1354	65
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	45.8	45.8	45.8	45.8	45.8	9.0	65.0	65.0	9.2	65.2	65.2
Total Split (%)	38.2%	38.2%	38.2%	38.2%	38.2%	7.5%	54.2%	54.2%	7.7%	54.3%	54.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	23.1	23.1	23.1		23.1	10.1	79.7	79.7	6.0	70.4	70.4
Actuated g/C Ratio	0.19	0.19	0.19		0.19	0.08	0.66	0.66	0.05	0.59	0.59
v/c Ratio	0.42	0.54	0.15		0.90	0.48	0.85	0.22	0.20	0.70	0.07
Control Delay	48.0	48.1	8.4		83.9	52.4	25.4	7.2	78.6	6.2	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	48.1	8.4		83.9	52.4	25.4	7.2	78.6	6.2	0.1
LOS	D	D	A		F	D	C	A	E	A	A
Approach Delay		41.5			83.9		24.4			6.7	
Approach LOS		D			F		C			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 96.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	180	50	75	100	24	63	1874	217	16	1354	65
Future Volume (veh/h)	72	180	50	75	100	24	63	1874	217	16	1354	65
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	74	186	52	77	103	21	65	1932	168	16	1396	38
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	232	404	343	117	144	26	74	2124	950	28	2026	887
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.09	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1216	1800	1530	337	640	114	1619	3420	1530	1619	3420	1497
Grp Volume(v), veh/h	74	186	52	201	0	0	65	1932	168	16	1396	38
Grp Sat Flow(s),veh/h/ln	1216	1800	1530	1091	0	0	1619	1710	1530	1619	1710	1497
Q Serve(g_s), s	0.0	10.7	3.3	12.0	0.0	0.0	4.8	0.0	0.0	1.2	0.0	0.0
Cycle Q Clear(g_c), s	11.3	10.7	3.3	22.8	0.0	0.0	4.8	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	0.38		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	404	343	286	0	0	74	2124	950	28	2026	887
V/C Ratio(X)	0.32	0.46	0.15	0.70	0.00	0.00	0.88	0.91	0.18	0.57	0.69	0.04
Avail Cap(c_a), veh/h	352	582	495	431	0	0	74	2124	950	77	2026	887
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.14	0.14	0.14
Uniform Delay (d), s/veh	40.5	40.3	37.4	46.6	0.0	0.0	54.2	0.0	0.0	57.5	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.2	3.1	0.0	0.0	10.1	0.8	0.0	1.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.4	1.4	6.7	0.0	0.0	2.3	0.2	0.0	0.5	0.1	0.0
LnGrp Delay(d),s/veh	41.3	41.1	37.6	49.7	0.0	0.0	64.2	0.8	0.0	58.5	0.3	0.0
LnGrp LOS	D	D	D	D			E	A	A	E	A	A
Approach Vol, veh/h		312			201			2165			1450	
Approach Delay, s/veh		40.6			49.7			2.6			0.9	
Approach LOS		D			D			A			A	

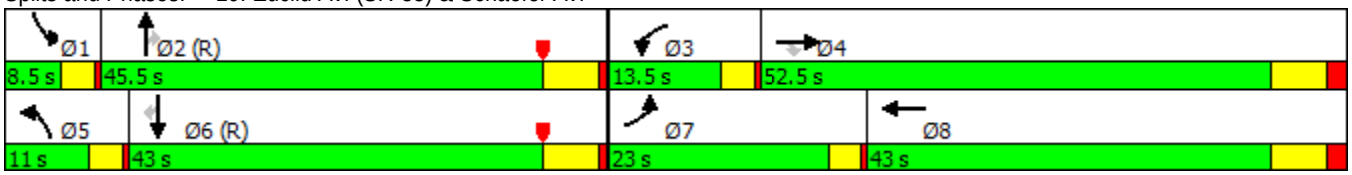
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	80.5		33.9	9.0	77.1		33.9
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	59.0		38.8	5.5	59.2		38.8
Max Q Clear Time (g_c+I1), s	3.2	2.0		13.3	6.8	2.0		24.8
Green Ext Time (p_c), s	0.0	46.8		2.6	0.0	46.9		2.1

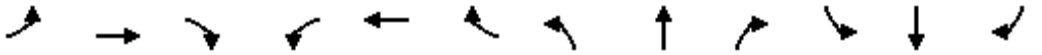
Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	312	234	192	28	51	121	1844	41	23	1342	137
Future Volume (vph)	312	234	192	28	51	121	1844	41	23	1342	137
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	27.4	27.4	10.0	14.9	16.4	65.7	65.7	5.7	51.6	51.6
Actuated g/C Ratio	0.16	0.23	0.23	0.08	0.12	0.14	0.55	0.55	0.05	0.43	0.43
v/c Ratio	1.23	0.59	0.39	0.22	0.30	0.57	1.02	0.05	0.32	0.94	0.20
Control Delay	174.3	45.9	6.4	55.6	38.7	41.4	40.9	2.6	76.0	35.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	174.3	45.9	6.4	55.6	38.7	41.4	40.9	2.6	76.0	35.8	4.5
LOS	F	D	A	E	D	D	D	A	E	D	A
Approach Delay		90.0			43.7		40.1			33.6	
Approach LOS		F			D		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 46.4	Intersection LOS: D
Intersection Capacity Utilization 98.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	312	234	192	28	51	15	121	1844	41	23	1342	137
Future Volume (veh/h)	312	234	192	28	51	15	121	1844	41	23	1342	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	322	241	122	29	53	10	125	1901	33	24	1384	88
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	316	268	84	95	18	101	1995	893	37	1860	814
Arrive On Green	0.16	0.18	0.18	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1473	278	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	322	241	122	29	0	63	125	1901	33	24	1384	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1751	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	15.3	8.6	2.1	0.0	4.2	7.5	66.0	2.1	1.8	46.0	5.9
Cycle Q Clear(g_c), s	19.5	15.3	8.6	2.1	0.0	4.2	7.5	66.0	2.1	1.8	46.0	5.9
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	316	268	84	0	113	101	1995	893	37	1860	814
V/C Ratio(X)	1.22	0.76	0.45	0.35	0.00	0.56	1.24	0.95	0.04	0.65	0.74	0.11
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	1995	893	67	1860	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.68	0.68	0.68
Uniform Delay (d), s/veh	50.3	47.1	44.3	54.9	0.0	54.5	58.8	46.8	21.0	59.1	41.3	24.9
Incr Delay (d2), s/veh	129.8	2.9	0.9	0.9	0.0	3.2	113.7	1.5	0.0	4.7	1.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.2	7.9	3.7	0.9	0.0	2.1	6.6	31.7	0.9	0.8	22.3	2.5
LnGrp Delay(d),s/veh	180.0	50.0	45.2	55.9	0.0	57.7	172.5	48.3	21.0	63.8	43.2	25.1
LnGrp LOS	F	D	D	E		E	F	D	C	E	D	C
Approach Vol, veh/h		685			92			2059			1496	
Approach Delay, s/veh		110.3			57.1			55.4			42.5	
Approach LOS		F			E			E			D	

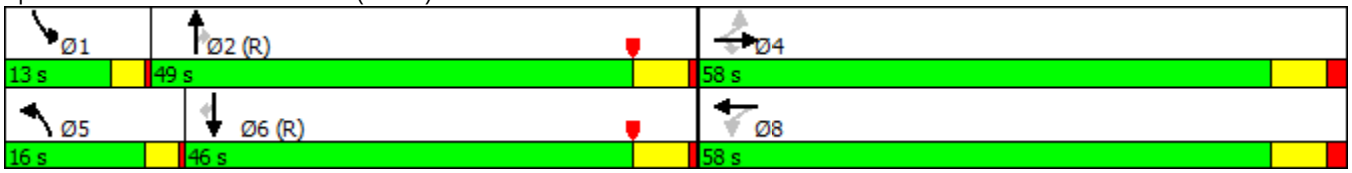
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	76.0	9.7	28.0	11.0	71.3	23.0	14.7
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.8	68.0	4.1	17.3	9.5	48.0	21.5	6.2
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	59.7
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	357	490	287	29	145	169	1583	79	71	1309	176
Future Volume (vph)	357	490	287	29	145	169	1583	79	71	1309	176
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	45.0	45.0	45.0	45.0	45.0	15.6	51.8	51.8	8.5	42.8	42.8
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.13	0.43	0.43	0.07	0.36	0.36
v/c Ratio	0.91	0.74	0.42	0.19	0.27	0.82	1.09	0.12	0.64	1.09	0.29
Control Delay	63.2	39.0	8.8	26.0	24.2	58.7	85.6	14.4	86.2	74.9	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	39.0	8.8	26.0	24.2	58.7	85.6	14.4	86.2	74.9	4.8
LOS	E	D	A	C	C	E	F	B	F	E	A
Approach Delay		39.0			24.4		80.0			67.4	
Approach LOS		D			C		E			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 63.6	Intersection LOS: E
Intersection Capacity Utilization 102.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	357	490	287	29	145	31	169	1583	79	71	1309	176
Future Volume (veh/h)	357	490	287	29	145	31	169	1583	79	71	1309	176
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	364	500	201	30	148	27	172	1615	61	72	1336	153
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	455	732	613	187	602	110	169	1372	614	89	1203	538
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.03	0.13	0.13	0.11	0.70	0.70
Sat Flow, veh/h	1161	1800	1509	715	1482	270	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	364	500	201	30	0	175	172	1615	61	72	1336	153
Grp Sat Flow(s),veh/h/ln	1161	1800	1509	715	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	36.2	27.4	10.9	4.3	0.0	7.9	12.5	48.2	4.2	5.2	42.2	4.4
Cycle Q Clear(g_c), s	44.1	27.4	10.9	31.7	0.0	7.9	12.5	48.2	4.2	5.2	42.2	4.4
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	455	732	613	187	0	712	169	1372	614	89	1203	538
V/C Ratio(X)	0.80	0.68	0.33	0.16	0.00	0.25	1.02	1.18	0.10	0.81	1.11	0.28
Avail Cap(c_a), veh/h	477	765	641	201	0	745	169	1372	614	128	1203	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.63	0.63	0.63	0.39	0.39	0.39
Uniform Delay (d), s/veh	38.0	29.3	24.4	42.3	0.0	23.5	57.9	52.1	33.0	52.8	17.8	12.2
Incr Delay (d2), s/veh	9.0	2.4	0.3	0.4	0.0	0.2	60.3	84.8	0.2	6.2	54.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	14.1	4.6	0.9	0.0	3.9	8.4	39.0	1.8	2.5	28.2	1.9
LnGrp Delay(d),s/veh	47.0	31.7	24.7	42.7	0.0	23.7	118.4	136.8	33.2	59.0	72.7	12.7
LnGrp LOS	D	C	C	D		C	F	F	C	E	F	B
Approach Vol, veh/h		1065			205			1848			1561	
Approach Delay, s/veh		35.6			26.4			131.7			66.2	
Approach LOS		D			C			F			E	

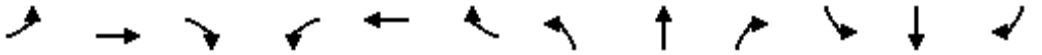
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.1	54.2		55.8	16.0	48.2		55.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	7.2	50.2		46.1	14.5	44.2		33.7
Green Ext Time (p_c), s	0.0	0.0		2.7	0.0	0.0		6.0

Intersection Summary	
HCM 2010 Ctrl Delay	83.3
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	51	29	212	7	13	142	1709	13	11	1596	52
Future Volume (vph)	51	29	212	7	13	142	1709	13	11	1596	52
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.8	15.8	15.8	15.8	15.8	15.8	89.9	89.9	5.5	74.3	74.3
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.75	0.75	0.05	0.62	0.62
v/c Ratio	0.33	0.14	0.65	0.05	0.11	0.73	0.72	0.01	0.16	0.82	0.06
Control Delay	47.6	41.0	20.6	36.9	25.6	58.8	11.0	0.0	70.7	12.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	41.0	20.6	36.9	25.6	58.8	11.0	0.0	70.7	12.9	0.1
LOS	D	D	C	D	C	E	B	A	E	B	A
Approach Delay		27.4			28.3		14.5			12.9	
Approach LOS		C			C		B			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 77.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	29	212	7	13	10	142	1709	13	11	1596	52
Future Volume (veh/h)	51	29	212	7	13	10	142	1709	13	11	1596	52
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	55	32	125	8	14	9	154	1858	13	12	1735	57
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	183	156	161	104	67	175	2626	1175	22	2302	1007
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.77	0.77	0.03	1.00	1.00
Sat Flow, veh/h	1332	1800	1530	1180	1025	659	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	55	32	125	8	0	23	154	1858	13	12	1735	57
Grp Sat Flow(s),veh/h/ln	1332	1800	1530	1180	0	1684	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.7	2.0	9.6	0.7	0.0	1.5	11.2	33.2	0.2	0.9	0.0	0.0
Cycle Q Clear(g_c), s	6.2	2.0	9.6	2.7	0.0	1.5	11.2	33.2	0.2	0.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	183	156	161	0	171	175	2626	1175	22	2302	1007
V/C Ratio(X)	0.31	0.17	0.80	0.05	0.00	0.13	0.88	0.71	0.01	0.54	0.75	0.06
Avail Cap(c_a), veh/h	510	630	535	454	0	589	175	2626	1175	67	2302	1007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.19	0.19	0.19
Uniform Delay (d), s/veh	51.9	49.3	52.7	50.5	0.0	49.1	52.7	7.1	3.3	58.0	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.3	7.0	0.1	0.0	0.3	35.6	1.6	0.0	2.8	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.0	4.4	0.2	0.0	0.7	6.8	15.8	0.1	0.4	0.1	0.0
LnGrp Delay(d),s/veh	52.6	49.6	59.7	50.6	0.0	49.3	88.3	8.7	3.3	60.8	0.4	0.0
LnGrp LOS	D	D	E	D		D	F	A	A	E	A	A
Approach Vol, veh/h		212			31			2025			1804	
Approach Delay, s/veh		56.3			49.7			14.7			0.8	
Approach LOS		E			D			B			A	

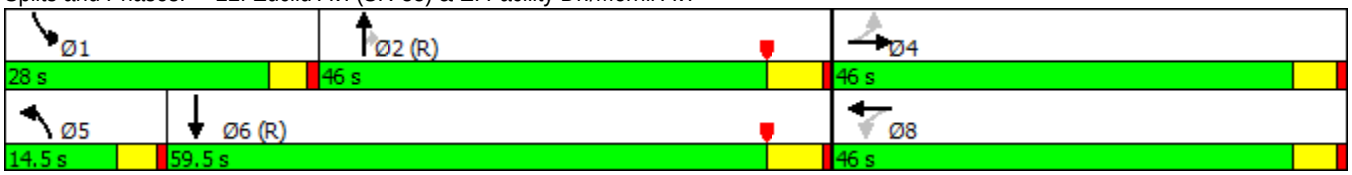
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	97.8		17.0	16.5	86.5		17.0
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.9	35.2		11.6	13.2	2.0		4.7
Green Ext Time (p_c), s	0.0	22.2		0.6	0.0	42.9		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	22	185	0	2	1442	356	698	1098
Future Volume (vph)	5	22	185	0	2	1442	356	698	1098
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	10.0	40.0	40.0	23.5	65.1
Actuated g/C Ratio		0.34		0.34	0.08	0.33	0.33	0.20	0.54
v/c Ratio		0.07		1.22	0.01	1.36	0.68	2.38	0.64
Control Delay		20.9		145.1	77.0	187.3	12.0	645.5	25.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.9		145.1	77.0	187.3	12.0	645.5	25.9
LOS		C		F	E	F	B	F	C
Approach Delay		20.9		145.1		152.5			266.6
Approach LOS		C		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.38	
Intersection Signal Delay: 198.1	Intersection LOS: F
Intersection Capacity Utilization 145.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	11	185	0	460	2	1442	356	698	1098	1
Future Volume (veh/h)	5	22	11	185	0	460	2	1442	356	698	1098	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	24	4	199	0	467	2	1551	354	751	1181	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	86	387	61	190	2	359	9	1140	499	317	1837	2
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.33	0.33	0.20	0.52	0.52
Sat Flow, veh/h	151	1133	177	443	5	1051	1619	3420	1496	1619	3506	3
Grp Volume(v), veh/h	33	0	0	666	0	0	2	1551	354	751	576	606
Grp Sat Flow(s),veh/h/ln	1461	0	0	1499	0	0	1619	1710	1496	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	39.5	0.0	0.0	0.1	40.0	24.8	23.5	29.0	29.0
Cycle Q Clear(g_c), s	1.5	0.0	0.0	41.0	0.0	0.0	0.1	40.0	24.8	23.5	29.0	29.0
Prop In Lane	0.15		0.12	0.30		0.70	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	534	0	0	551	0	0	9	1140	499	317	896	943
V/C Ratio(X)	0.06	0.00	0.00	1.21	0.00	0.00	0.23	1.36	0.71	2.37	0.64	0.64
Avail Cap(c_a), veh/h	534	0	0	551	0	0	135	1140	499	317	896	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	40.8	0.0	0.0	59.4	40.0	34.9	48.3	20.5	20.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	110.0	0.0	0.0	0.4	162.8	0.8	625.5	3.5	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	35.1	0.0	0.0	0.1	44.6	10.3	65.6	14.5	15.2
LnGrp Delay(d),s/veh	26.5	0.0	0.0	150.9	0.0	0.0	59.9	202.8	35.7	673.8	24.1	23.9
LnGrp LOS	C			F			E	F	D	F	C	C
Approach Vol, veh/h		33			666			1907			1933	
Approach Delay, s/veh		26.5			150.9			171.6			276.4	
Approach LOS		C			F			F			F	

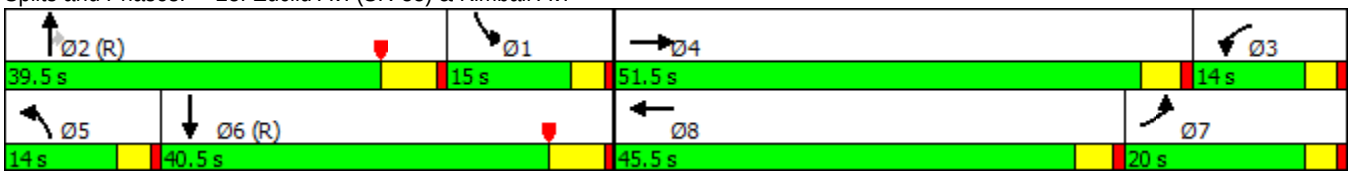
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.0	46.0		46.0	5.1	68.9		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	25.5	42.0		3.5	2.1	31.0		43.0
Green Ext Time (p_c), s	0.0	0.0		3.1	0.0	18.5		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		212.2	
HCM 2010 LOS		F	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	638	812	207	342	126	829	155	248	896
Future Volume (vph)	638	812	207	342	126	829	155	248	896
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	31.8	40.1	16.9	25.2	10.0	32.9	32.9	11.6	34.5
Actuated g/C Ratio	0.26	0.33	0.14	0.21	0.08	0.27	0.27	0.10	0.29
v/c Ratio	1.56	0.82	0.95	0.79	0.98	0.92	0.30	1.64	1.18
Control Delay	293.3	42.6	100.8	38.2	98.1	46.9	12.8	342.6	122.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	293.3	42.6	100.8	38.2	98.1	46.9	12.8	342.6	122.0
LOS	F	D	F	D	F	D	B	F	F
Approach Delay		147.0		53.9		47.9			162.6
Approach LOS		F		D		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.64	
Intersection Signal Delay: 112.5	Intersection LOS: F
Intersection Capacity Utilization 115.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	638	812	83	207	342	279	126	829	155	248	896	204
Future Volume (veh/h)	638	812	83	207	342	279	126	829	155	248	896	204
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	665	846	82	216	356	257	131	864	146	258	933	194
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	286	975	94	135	413	293	135	937	419	263	1041	216
Arrive On Green	0.18	0.31	0.31	0.08	0.22	0.22	0.03	0.09	0.09	0.16	0.37	0.37
Sat Flow, veh/h	1619	3151	305	1619	1912	1358	1619	3420	1530	1619	2814	584
Grp Volume(v), veh/h	665	459	469	216	318	295	131	864	146	258	567	560
Grp Sat Flow(s),veh/h/ln	1619	1710	1746	1619	1710	1560	1619	1710	1530	1619	1710	1688
Q Serve(g_s), s	21.2	30.4	30.4	10.0	21.5	22.0	9.7	30.1	10.8	19.1	37.5	37.6
Cycle Q Clear(g_c), s	21.2	30.4	30.4	10.0	21.5	22.0	9.7	30.1	10.8	19.1	37.5	37.6
Prop In Lane	1.00		0.17	1.00		0.87	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	286	529	540	135	369	337	135	937	419	263	632	624
V/C Ratio(X)	2.32	0.87	0.87	1.60	0.86	0.88	0.97	0.92	0.35	0.98	0.90	0.90
Avail Cap(c_a), veh/h	286	670	684	135	584	533	135	955	427	263	632	624
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.37	0.37	0.37	1.00	1.00	1.00	0.41	0.41	0.41	0.73	0.73	0.73
Uniform Delay (d), s/veh	49.4	39.1	39.1	55.0	45.3	45.5	58.2	53.3	44.5	50.1	35.6	35.7
Incr Delay (d2), s/veh	599.6	4.0	3.9	302.2	4.5	6.1	41.2	7.5	0.9	42.1	13.8	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	57.1	14.9	15.2	15.8	10.6	10.0	5.9	15.3	4.7	11.6	20.1	19.9
LnGrp Delay(d),s/veh	648.9	43.1	43.0	357.2	49.8	51.6	99.4	60.8	45.4	92.2	49.4	49.7
LnGrp LOS	F	D	D	F	D	D	F	E	D	F	D	D
Approach Vol, veh/h		1593			829			1141			1385	
Approach Delay, s/veh		296.0			130.6			63.3			57.5	
Approach LOS		F			F			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.5	38.9	14.0	41.6	14.0	50.4	25.2	30.4
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	21.1	32.1	12.0	32.4	11.7	39.6	23.2	24.0
Green Ext Time (p_c), s	0.0	0.8	0.0	4.7	0.0	0.0	0.0	1.9

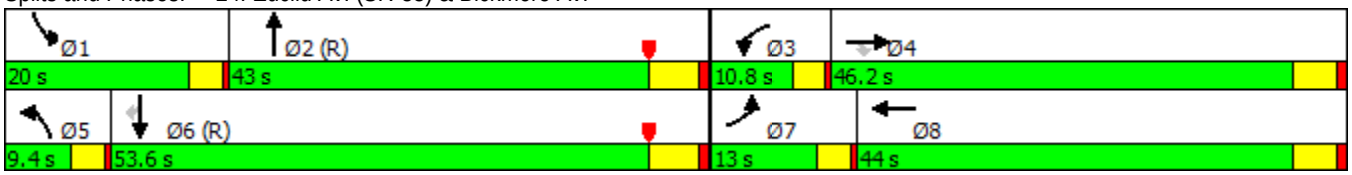
Intersection Summary	
HCM 2010 Ctrl Delay	147.9
HCM 2010 LOS	F

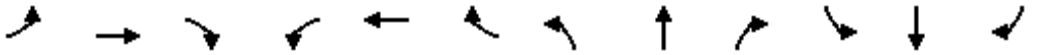
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	117	122	120	91	43	48	880	219	849	79
Future Volume (vph)	117	122	120	91	43	48	880	219	849	79
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.5	18.0	18.0	7.3	15.8	7.5	52.0	25.2	71.4	71.4
Actuated g/C Ratio	0.08	0.15	0.15	0.06	0.13	0.06	0.43	0.21	0.60	0.60
v/c Ratio	1.02	0.50	0.39	1.03	0.57	0.53	0.83	0.72	0.46	0.09
Control Delay	140.7	50.8	8.9	154.6	22.3	80.8	14.9	58.5	5.1	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	140.7	50.8	8.9	154.6	22.3	80.8	14.9	58.5	5.1	0.8
LOS	F	D	A	F	C	F	B	E	A	A
Approach Delay		66.1			70.2		17.7		15.0	
Approach LOS		E			E		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 78.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	122	120	91	43	117	48	880	207	219	849	79
Future Volume (veh/h)	117	122	120	91	43	117	48	880	207	219	849	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	130	136	114	101	48	118	53	978	220	243	943	88
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	128	263	224	98	59	145	66	1409	316	223	2074	909
Arrive On Green	0.08	0.15	0.15	0.06	0.13	0.13	0.05	0.68	0.68	0.28	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	462	1137	1619	2765	620	1619	3420	1498
Grp Volume(v), veh/h	130	136	114	101	0	166	53	604	594	243	943	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1599	1619	1710	1675	1619	1710	1498
Q Serve(g_s), s	9.5	8.4	8.2	7.3	0.0	12.1	3.9	25.8	25.9	16.5	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.4	8.2	7.3	0.0	12.1	3.9	25.8	25.9	16.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.71	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	128	263	224	98	0	204	66	872	854	223	2074	909
V/C Ratio(X)	1.01	0.52	0.51	1.03	0.00	0.81	0.81	0.69	0.70	1.09	0.45	0.10
Avail Cap(c_a), veh/h	128	618	525	98	0	520	80	872	854	223	2074	909
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.3	47.3	47.3	56.3	0.0	50.9	56.3	13.6	13.7	43.5	0.0	0.0
Incr Delay (d2), s/veh	83.3	0.6	0.7	97.7	0.0	3.0	3.8	0.4	0.4	48.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	4.2	3.5	5.9	0.0	5.5	1.8	12.0	11.8	10.3	0.0	0.0
LnGrp Delay(d),s/veh	138.7	47.9	47.9	154.4	0.0	53.9	60.0	14.0	14.1	92.1	0.1	0.0
LnGrp LOS	F	D	D	F		D	E	B	B	F	A	A
Approach Vol, veh/h		380			267			1251			1274	
Approach Delay, s/veh		79.0			91.9			16.0			17.6	
Approach LOS		E			F			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	66.7	10.8	22.5	8.4	78.3	13.0	20.3
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	18.5	27.9	9.3	10.4	5.9	2.0	11.5	14.1
Green Ext Time (p_c), s	0.0	5.8	0.0	1.2	0.0	11.2	0.0	1.2

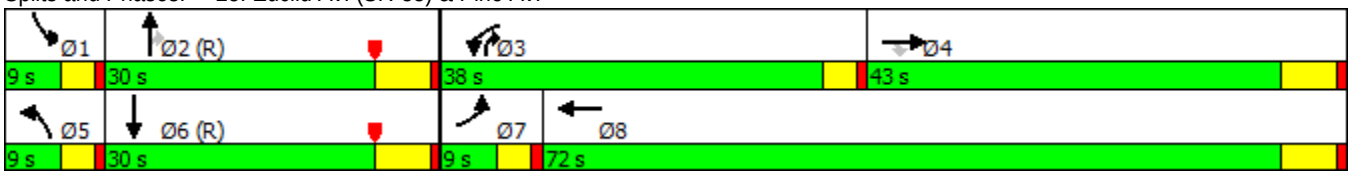
Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

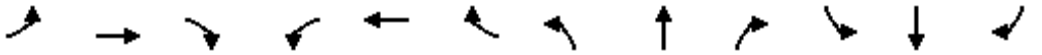
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	353	30	494	80	35	1006	1117	106	901
Future Volume (vph)	15	353	30	494	80	35	1006	1117	106	901
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	30.1	30.1	34.0	64.5	6.2	24.0	64.0	11.9	31.6
Actuated g/C Ratio	0.04	0.25	0.25	0.28	0.54	0.05	0.20	0.53	0.10	0.26
v/c Ratio	0.22	0.81	0.06	0.61	0.16	0.44	1.52	1.26	0.68	1.05
Control Delay	63.7	56.0	0.3	41.0	9.1	67.2	266.5	139.3	59.5	80.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	56.0	0.3	41.0	9.1	67.2	266.5	139.3	59.5	80.9
LOS	E	E	A	D	A	E	F	F	E	F
Approach Delay		52.1			33.9		197.4			78.7
Approach LOS		D			C		F			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.52
Intersection Signal Delay: 130.3 — Intersection LOS: F
Intersection Capacity Utilization 110.8% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	353	30	494	80	60	35	1006	1117	106	901	15
Future Volume (veh/h)	15	353	30	494	80	60	35	1006	1117	106	901	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	364	0	509	82	56	36	1037	719	109	929	11
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	423	359	566	409	279	47	1249	852	67	1308	15
Arrive On Green	0.02	0.23	0.00	0.19	0.41	0.41	0.03	0.37	0.37	0.01	0.12	0.12
Sat Flow, veh/h	1619	1800	1530	2956	998	682	1619	3420	1530	1619	3461	41
Grp Volume(v), veh/h	15	364	0	509	0	138	36	1037	719	109	459	481
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1680	1619	1710	1530	1619	1710	1792
Q Serve(g_s), s	1.1	23.3	0.0	20.2	0.0	6.3	2.6	33.1	43.8	5.0	30.9	30.9
Cycle Q Clear(g_c), s	1.1	23.3	0.0	20.2	0.0	6.3	2.6	33.1	43.8	5.0	30.9	30.9
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	27	423	359	566	0	689	47	1249	852	67	646	677
V/C Ratio(X)	0.57	0.86	0.00	0.90	0.00	0.20	0.76	0.83	0.84	1.62	0.71	0.71
Avail Cap(c_a), veh/h	67	555	472	838	0	924	67	1249	852	67	646	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.86	0.86	0.86
Uniform Delay (d), s/veh	58.6	44.0	0.0	47.4	0.0	22.8	57.8	34.7	22.2	59.2	46.2	46.2
Incr Delay (d2), s/veh	6.8	11.6	0.0	6.9	0.0	0.2	1.6	0.6	1.0	327.7	5.6	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.9	0.0	8.8	0.0	3.0	1.2	15.7	20.1	8.4	15.7	16.4
LnGrp Delay(d),s/veh	65.4	55.7	0.0	54.2	0.0	23.0	59.4	35.3	23.3	386.9	51.8	51.6
LnGrp LOS	E	E		D		C	E	D	C	F	D	D
Approach Vol, veh/h		379			647			1792			1049	
Approach Delay, s/veh		56.0			47.6			31.0			86.5	
Approach LOS		E			D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	49.8	27.0	34.2	7.5	51.3	6.0	55.2
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	45.8	22.2	25.3	4.6	32.9	3.1	8.3
Green Ext Time (p_c), s	0.0	0.0	0.8	2.9	0.0	0.0	0.0	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	51.3
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	858	185	322	1153	159	1395
Future Volume (vph)	858	185	322	1153	159	1395
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	44.0	44.0	40.0	84.0	36.0	36.0
Total Split (%)	36.7%	36.7%	33.3%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	46.8	46.8	29.2	79.5	32.5	32.5
Actuated g/C Ratio	0.39	0.39	0.24	0.66	0.27	0.27
v/c Ratio	0.71	0.29	0.86	0.57	0.20	1.93
Control Delay	37.3	9.6	66.3	3.3	34.4	441.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	9.6	66.3	3.3	34.4	441.1
LOS	D	A	E	A	C	F
Approach Delay	32.4			17.1	399.4	
Approach LOS	C			B	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.93	
Intersection Signal Delay: 166.9	Intersection LOS: F
Intersection Capacity Utilization 123.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	858	185	322	1153	159	1395
Future Volume (veh/h)	858	185	322	1153	159	1395
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	953	0	358	1281	177	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2074	928	385	2942	243	112
Arrive On Green	1.00	0.00	0.22	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	953	0	358	1281	177	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	24.6	10.1	6.3	0.0
Cycle Q Clear(g_c), s	0.0	0.0	24.6	10.1	6.3	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2074	928	385	2942	243	112
V/C Ratio(X)	0.46	0.00	0.93	0.44	0.73	0.00
Avail Cap(c_a), veh/h	2074	928	521	2942	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.36	0.36	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	45.6	1.9	54.4	0.0
Incr Delay (d2), s/veh	0.7	0.0	7.6	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	12.4	4.7	3.0	0.0
LnGrp Delay(d),s/veh	0.7	0.0	53.2	2.0	58.5	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	953			1639	177	
Approach Delay, s/veh	0.7			13.2	58.5	
Approach LOS	A			B	E	

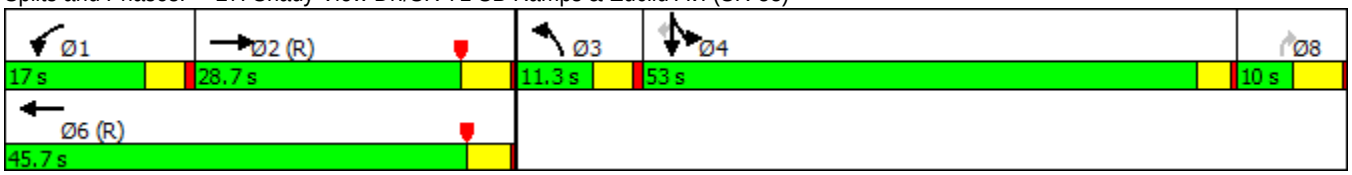
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	30.4	77.3				107.7		12.3
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	36.5	39.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	26.6	2.0				12.1		8.3
Green Ext Time (p_c), s	0.4	18.1				21.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	328	105	243	31	16	770	149	162
Future Volume (vph)	328	105	243	31	16	770	149	162
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.7	17.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.9%	14.2%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	35.5	11.7	52.1	6.5	5.0	43.1	43.1	43.1
Actuated g/C Ratio	0.30	0.10	0.43	0.05	0.04	0.36	0.36	0.36
v/c Ratio	0.38	0.69	0.17	0.37	0.08	0.85	0.81	0.25
Control Delay	37.4	71.4	11.8	66.7	0.9	50.2	45.5	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	71.4	11.8	66.7	0.9	50.2	45.5	4.3
LOS	D	E	B	E	A	D	D	A
Approach Delay	37.4		29.8				41.3	
Approach LOS	D		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 38.4	Intersection LOS: D
Intersection Capacity Utilization 62.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	328	45	105	243	0	31	0	16	770	149	162
Future Volume (veh/h)	0	328	45	105	243	0	31	0	16	770	149	162
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	338	46	108	251	0	32	0	16	904	0	167
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1510	204	129	2106	0	0	0	0	1015	0	480
Arrive On Green	0.00	0.50	0.50	0.16	1.00	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3119	409	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	190	194	108	251	0		0.0		904	0	167
Grp Sat Flow(s),veh/h/ln	0	1710	1728	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	7.5	7.6	7.8	0.0	0.0				31.9	0.0	10.1
Cycle Q Clear(g_c), s	0.0	7.5	7.6	7.8	0.0	0.0				31.9	0.0	10.1
Prop In Lane	0.00		0.24	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	853	861	129	2106	0				1015	0	480
V/C Ratio(X)	0.00	0.22	0.23	0.84	0.12	0.00				0.89	0.00	0.35
Avail Cap(c_a), veh/h	0	853	861	169	2106	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.0	17.0	49.7	0.0	0.0				39.2	0.0	31.7
Incr Delay (d2), s/veh	0.0	0.6	0.6	23.8	0.1	0.0				6.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.7	3.8	4.3	0.0	0.0				15.1	0.0	4.3
LnGrp Delay(d),s/veh	0.0	17.6	17.6	73.5	0.1	0.0				45.5	0.0	32.2
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		384			359						1071	
Approach Delay, s/veh		17.6			22.2						43.4	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.1	64.8		41.1		78.9		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	12.5	23.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.8	9.6		33.9		2.0		
Green Ext Time (p_c), s	0.1	2.1		3.7		2.5		

Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1220	0	0	889	0	0	0	0	0	0	0
Future Vol, veh/h	0	1220	0	0	889	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1284	0	0	936	0	0	0	0	0	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	936	0	-	-	-	0				2220	2220	936
Stage 1	-	-	-	-	-	-				936	936	-
Stage 2	-	-	-	-	-	-				1284	1284	-
Critical Hdwy	4.1	-	-	-	-	-				6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-				5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	740	-	0	0	-	-				48	44	324
Stage 1	-	-	0	0	-	-				385	346	-
Stage 2	-	-	0	0	-	-				262	238	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	740	-	-	-	-	-				48	0	324
Mov Cap-2 Maneuver	-	-	-	-	-	-				163	0	-
Stage 1	-	-	-	-	-	-				385	0	-
Stage 2	-	-	-	-	-	-				262	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	740	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1144	87	27	835	37	20
Future Vol, veh/h	1144	87	27	835	37	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1230	94	29	898	40	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1324	0	2233	662
Stage 1	-	-	-	-	1277	-
Stage 2	-	-	-	-	956	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	528	-	42	409
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	376	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	528	-	40	409
Mov Cap-2 Maneuver	-	-	-	-	184	-
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	355	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	24.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	184	409	-	-	528	-
HCM Lane V/C Ratio	0.216	0.053	-	-	0.055	-
HCM Control Delay (s)	29.9	14.3	-	-	12.2	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.8	0.2	-	-	0.2	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1031	39	780	82	23
Future Volume (vph)	1031	39	780	82	23
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.4	5.2	27.6	10.5	10.5
Actuated g/C Ratio	0.49	0.10	0.55	0.21	0.21
v/c Ratio	0.74	0.24	0.82	0.25	0.07
Control Delay	13.6	28.3	16.4	22.4	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	28.3	16.4	22.4	10.7
LOS	B	C	B	C	B
Approach Delay	13.6		16.9	19.9	
Approach LOS	B		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 49.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 61.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1031	134	39	780	82	23
Future Volume (veh/h)	1031	134	39	780	82	23
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1085	141	41	821	86	22
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1454	189	69	1091	301	284
Arrive On Green	0.48	0.48	0.04	0.61	0.19	0.19
Sat Flow, veh/h	3123	394	1619	1800	1619	1530
Grp Volume(v), veh/h	611	615	41	821	86	22
Grp Sat Flow(s),veh/h/ln	1710	1717	1619	1800	1619	1530
Q Serve(g_s), s	15.7	15.8	1.4	17.9	2.5	0.6
Cycle Q Clear(g_c), s	15.7	15.8	1.4	17.9	2.5	0.6
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	819	823	69	1091	301	284
V/C Ratio(X)	0.75	0.75	0.60	0.75	0.29	0.08
Avail Cap(c_a), veh/h	909	913	152	1278	301	284
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.5	25.6	7.7	19.0	18.3
Incr Delay (d2), s/veh	3.0	3.1	3.1	2.2	2.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	8.1	0.7	9.3	1.3	0.3
LnGrp Delay(d),s/veh	14.5	14.6	28.6	9.9	21.4	18.8
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1226			862	108	
Approach Delay, s/veh	14.5			10.8	20.9	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.9	32.2				39.2		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	3.4	17.8				19.9		4.5
Green Ext Time (p_c), s	0.0	8.2				12.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	967	48	740	79	32
Future Volume (vph)	967	48	740	79	32
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.1	5.7	29.5	10.5	10.5
Actuated g/C Ratio	0.47	0.11	0.58	0.20	0.20
v/c Ratio	0.75	0.29	0.77	0.26	0.10
Control Delay	15.2	29.2	13.4	23.6	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	29.2	13.4	23.6	16.2
LOS	B	C	B	C	B
Approach Delay	15.2		14.3	21.5	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 58.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	967	125	48	740	79	32
Future Volume (veh/h)	967	125	48	740	79	32
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1040	134	52	796	85	28
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1436	185	82	1097	304	287
Arrive On Green	0.47	0.47	0.05	0.61	0.19	0.19
Sat Flow, veh/h	3129	391	1619	1800	1619	1530
Grp Volume(v), veh/h	585	589	52	796	85	28
Grp Sat Flow(s),veh/h/ln	1710	1720	1619	1800	1619	1530
Q Serve(g_s), s	14.6	14.6	1.7	16.5	2.4	0.8
Cycle Q Clear(g_c), s	14.6	14.6	1.7	16.5	2.4	0.8
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	808	813	82	1097	304	287
V/C Ratio(X)	0.72	0.72	0.64	0.73	0.28	0.10
Avail Cap(c_a), veh/h	922	927	179	1325	304	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	11.3	24.8	7.3	18.5	17.9
Incr Delay (d2), s/veh	2.4	2.5	3.1	1.6	2.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	7.4	0.8	8.4	1.3	0.4
LnGrp Delay(d),s/veh	13.7	13.7	27.9	8.9	20.8	18.6
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1174			848	113	
Approach Delay, s/veh	13.7			10.0	20.3	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.3	31.4				38.7		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.7	16.6				18.5		4.4
Green Ext Time (p_c), s	0.0	8.5				12.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	49.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	268	683	47	14	416	89	26	6	10	76	18	348
Future Vol, veh/h	268	683	47	14	416	89	26	6	10	76	18	348
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	285	727	50	15	443	95	28	6	11	81	19	370

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	537	0	0	781	0	0	2040	1893	392	1457	1871	490
Stage 1	-	-	-	-	-	-	1326	1326	-	520	520	-
Stage 2	-	-	-	-	-	-	714	567	-	937	1351	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1041	-	-	845	-	-	38	71	613	100	73	582
Stage 1	-	-	-	-	-	-	167	227	-	543	535	-
Stage 2	-	-	-	-	-	-	425	510	-	289	221	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1041	-	-	845	-	-	~ 9	50	611	~ 73	52	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	429	107	-	141	118	-
Stage 1	-	-	-	-	-	-	121	164	-	394	526	-
Stage 2	-	-	-	-	-	-	146	501	-	198	160	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.3	18.3	214.9
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	316	1041	-	-	845	-	-	343
HCM Lane V/C Ratio	0.141	0.274	-	-	0.018	-	-	1.371
HCM Control Delay (s)	18.3	9.8	-	-	9.3	-	-	214.9
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.5	1.1	-	-	0.1	-	-	23.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	701	38	19	424	2	24	0	12	11	0	71
Future Vol, veh/h	30	701	38	19	424	2	24	0	12	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	797	43	22	482	2	27	0	14	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	484	0	0	840	0	0	1448	1410	420	990	1431	483
Stage 1	-	-	-	-	-	-	883	883	-	526	526	-
Stage 2	-	-	-	-	-	-	565	527	-	464	905	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1089	-	-	804	-	-	102	140	588	215	136	588
Stage 1	-	-	-	-	-	-	311	367	-	539	532	-
Stage 2	-	-	-	-	-	-	513	532	-	553	358	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1089	-	-	804	-	-	85	132	588	201	128	588
Mov Cap-2 Maneuver	-	-	-	-	-	-	241	296	-	201	128	-
Stage 1	-	-	-	-	-	-	302	356	-	523	517	-
Stage 2	-	-	-	-	-	-	433	517	-	524	347	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	18.9	14.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	300	1089	-	-	804	-	-	467
HCM Lane V/C Ratio	0.136	0.03	-	-	0.027	-	-	0.191
HCM Control Delay (s)	18.9	8.4	-	-	9.6	-	-	14.5
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	0.7

Intersection	
Intersection Delay, s/veh	25.9
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	351	0	373	0	0	0	0	0	193	159	0
Future Vol, veh/h	0	351	0	373	0	0	0	0	0	193	159	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	377	0	401	0	0	0	0	0	208	171	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	31.3	17.1
HCM LOS	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	193	159	351	373	334	204
LT Vol	193	0	351	0	0	0
Through Vol	0	159	0	0	334	0
RT Vol	0	0	0	373	0	204
Lane Flow Rate	208	171	377	401	359	219
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.483	0.373	0.821	0.736	0.757	0.418
Departure Headway (Hd)	8.376	7.86	7.832	6.608	7.585	6.864
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	432	458	464	549	478	524
Service Time	6.117	5.6	5.532	4.308	5.32	4.6
HCM Lane V/C Ratio	0.481	0.373	0.813	0.73	0.751	0.418
HCM Control Delay	18.7	15.2	37.5	25.5	30.4	14.5
HCM Lane LOS	C	C	E	D	D	B
HCM 95th-tile Q	2.6	1.7	7.8	6.2	6.4	2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	334	204
Future Vol, veh/h	0	0	334	204
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	359	219
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	24.4
HCM LOS	C

APPENDIX 8.2:

OPENING YEAR CUMULATIVE (2020) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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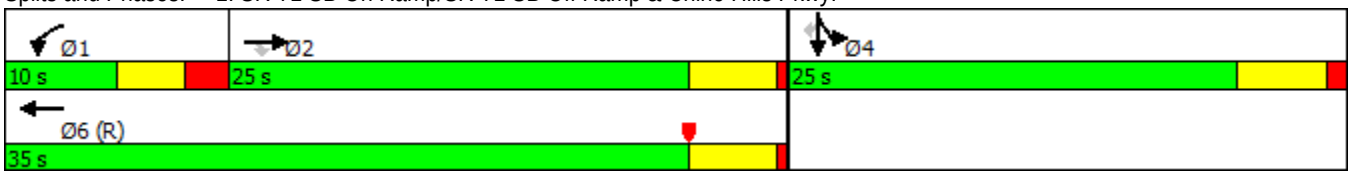
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1278	330	6	1004	584	88	415
Future Volume (vph)	1278	330	6	1004	584	88	415
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.45	0.38	0.04	0.60	0.67	0.64	0.73
Control Delay	11.8	3.2	27.7	9.7	25.2	23.3	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	3.2	27.7	9.7	25.2	23.3	21.6
LOS	B	A	C	A	C	C	C
Approach Delay	10.0			9.8		23.2	
Approach LOS	B			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 70.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1278	330	6	1004	0	0	0	0	584	88	415
Future Volume (veh/h)	0	1278	330	6	1004	0	0	0	0	584	88	415
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1318	270	6	1035	0				667	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2582	638	13	1738	0				1079	0	510
Arrive On Green	0.00	0.42	0.42	0.01	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6444	1529	1619	3510	0				3238	0	1530
Grp Volume(v), veh/h	0	1318	270	6	1035	0				667	0	0
Grp Sat Flow(s),veh/h/ln	0	1548	1529	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	9.5	7.5	0.2	9.8	0.0				10.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.5	7.5	0.2	9.8	0.0				10.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2582	638	13	1739	0				1079	0	510
V/C Ratio(X)	0.00	0.51	0.42	0.47	0.60	0.00				0.62	0.00	0.00
Avail Cap(c_a), veh/h	0	2582	638	135	1739	0				1079	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.71	0.71	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	13.0	12.4	29.6	6.4	0.0				16.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.4	6.8	1.1	0.0				2.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.1	3.2	0.1	4.7	0.0				5.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.1	12.8	36.4	7.4	0.0				19.4	0.0	0.0
LnGrp LOS		B	B	D	A					B		
Approach Vol, veh/h		1588			1041						667	
Approach Delay, s/veh		13.1			7.6						19.4	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	5.5	29.5		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.2	11.5		12.4		11.8		
Green Ext Time (p_c), s	0.0	8.0		1.3		15.0		

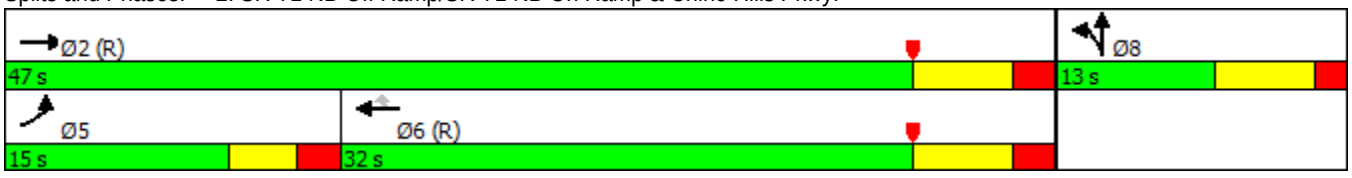
Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	581	1281	619	361	391	208
Future Volume (vph)	581	1281	619	361	391	208
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	15.0	47.0	32.0	32.0	13.0	13.0
Total Split (%)	25.0%	78.3%	53.3%	53.3%	21.7%	21.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.0	40.5	25.5	25.5	7.0	7.0
Actuated g/C Ratio	0.17	0.68	0.42	0.42	0.12	0.12
v/c Ratio	1.25	0.58	0.45	0.53	1.23	1.15
Control Delay	153.0	6.4	13.5	10.7	173.0	122.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	153.0	6.4	13.5	10.7	173.0	122.8
LOS	F	A	B	B	F	F
Approach Delay		52.1	12.5			139.3
Approach LOS		D	B			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.25	
Intersection Signal Delay: 56.2	Intersection LOS: E
Intersection Capacity Utilization 70.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	581	1281	0	0	619	361	391	208	9	0	0	0
Future Volume (veh/h)	581	1281	0	0	619	361	391	208	9	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	612	1348	0	0	652	379	428	197	6			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	493	2308	0	0	1454	640	378	203	6			
Arrive On Green	0.17	0.68	0.00	0.00	0.43	0.43	0.12	0.12	0.12			
Sat Flow, veh/h	2956	3510	0	0	3510	1506	3238	1738	53			
Grp Volume(v), veh/h	612	1348	0	0	652	379	428	0	203			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1506	1619	0	1791			
Q Serve(g_s), s	10.0	12.7	0.0	0.0	8.1	11.6	7.0	0.0	6.8			
Cycle Q Clear(g_c), s	10.0	12.7	0.0	0.0	8.1	11.6	7.0	0.0	6.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.03			
Lane Grp Cap(c), veh/h	493	2309	0	0	1454	640	378	0	209			
V/C Ratio(X)	1.24	0.58	0.00	0.00	0.45	0.59	1.13	0.00	0.97			
Avail Cap(c_a), veh/h	493	2309	0	0	1454	640	378	0	209			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.86	0.86	0.00	0.00	0.62	0.62	1.00	0.00	1.00			
Uniform Delay (d), s/veh	25.0	5.2	0.0	0.0	12.3	13.3	26.5	0.0	26.4			
Incr Delay (d2), s/veh	123.3	0.9	0.0	0.0	0.6	2.5	87.6	0.0	55.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.5	6.1	0.0	0.0	3.9	5.2	7.7	0.0	6.5			
LnGrp Delay(d),s/veh	148.3	6.2	0.0	0.0	12.9	15.8	114.1	0.0	81.7			
LnGrp LOS	F	A			B	B	F		F			
Approach Vol, veh/h		1960			1031			631				
Approach Delay, s/veh		50.5			13.9			103.7				
Approach LOS		D			B			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.0			15.0	32.0		13.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		40.5			10.0	25.5		7.0
Max Q Clear Time (g_c+I1), s		14.7			12.0	13.6		9.0
Green Ext Time (p_c), s		17.8			0.0	9.7		0.0

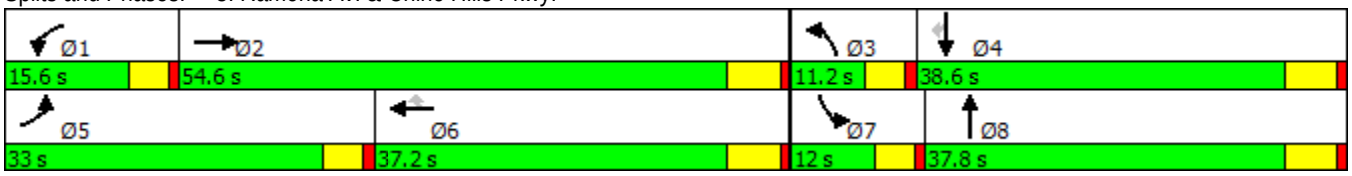
Intersection Summary	
HCM 2010 Ctrl Delay	49.4
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	368	918	70	692	102	28	415	98	188	260
Future Volume (vph)	368	918	70	692	102	28	415	98	188	260
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	28.4	51.2	9.0	29.8	29.8	6.0	32.0	7.4	37.4	37.4
Actuated g/C Ratio	0.24	0.43	0.08	0.25	0.25	0.05	0.27	0.06	0.32	0.32
v/c Ratio	1.00	0.46	0.60	0.85	0.22	0.35	0.66	1.03	0.18	0.41
Control Delay	91.4	25.3	73.3	52.6	2.8	66.9	39.7	152.1	31.8	6.0
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.4	25.7	73.3	52.6	2.8	66.9	39.7	152.1	31.8	6.0
LOS	F	C	E	D	A	E	D	F	C	A
Approach Delay		44.5		48.4			40.9		41.1	
Approach LOS		D		D			D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 44.3	Intersection LOS: D
Intersection Capacity Utilization 93.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	368	918	4	70	692	102	28	415	156	98	188	260
Future Volume (veh/h)	368	918	4	70	692	102	28	415	156	98	188	260
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	387	966	3	74	728	90	29	437	96	103	198	178
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	392	2174	7	92	836	368	42	760	166	102	1060	466
Arrive On Green	0.24	0.43	0.43	0.06	0.24	0.24	0.03	0.27	0.27	0.06	0.31	0.31
Sat Flow, veh/h	1619	5057	16	1619	3420	1507	1619	2785	607	1619	3420	1504
Grp Volume(v), veh/h	387	626	343	74	728	90	29	267	266	103	198	178
Grp Sat Flow(s),veh/h/ln	1619	1638	1797	1619	1710	1507	1619	1710	1682	1619	1710	1504
Q Serve(g_s), s	27.9	15.8	15.8	5.3	24.0	5.6	2.1	15.8	16.0	7.4	5.0	10.9
Cycle Q Clear(g_c), s	27.9	15.8	15.8	5.3	24.0	5.6	2.1	15.8	16.0	7.4	5.0	10.9
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	392	1408	772	92	836	368	42	467	459	102	1060	466
V/C Ratio(X)	0.99	0.44	0.44	0.80	0.87	0.24	0.69	0.57	0.58	1.01	0.19	0.38
Avail Cap(c_a), veh/h	392	1408	772	152	916	403	91	467	459	102	1060	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	23.6	23.6	54.7	42.5	35.6	56.6	36.7	36.8	54.9	29.6	31.7
Incr Delay (d2), s/veh	41.8	0.3	0.6	6.1	9.0	0.5	7.2	5.0	5.3	91.3	0.4	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.0	7.2	7.9	2.5	12.4	2.4	1.0	8.1	8.1	5.9	2.4	4.8
LnGrp Delay(d),s/veh	86.0	23.9	24.1	60.7	51.5	36.1	63.8	41.8	42.1	146.2	30.0	34.0
LnGrp LOS	F	C	C	E	D	D	E	D	D	F	C	C
Approach Vol, veh/h		1356			892			562			479	
Approach Delay, s/veh		41.7			50.7			43.1			56.5	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	56.2	7.7	42.1	33.0	34.5	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	7.3	17.8	4.1	12.9	29.9	26.0	9.4	18.0
Green Ext Time (p_c), s	0.0	18.8	0.0	4.6	0.0	2.7	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	946	101	29	738	113	33
Future Vol, veh/h	946	101	29	738	113	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1040	111	32	811	124	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1040	0	1509	520
Stage 1	-	-	-	-	1040	-
Stage 2	-	-	-	-	469	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	676	-	~ 113	506
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	676	-	~ 108	506
Mov Cap-2 Maneuver	-	-	-	-	269	-
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	574	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	29.8
HCM LOS			D

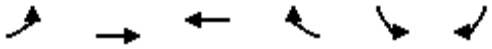
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	301	-	-	676	-
HCM Lane V/C Ratio	0.533	-	-	0.047	-
HCM Control Delay (s)	29.8	-	-	10.6	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.9	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	229	750	665	69	102
Future Volume (vph)	229	750	665	69	102
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	89.0	47.0	31.0	42.0
Total Split (%)	35.0%	74.2%	39.2%	25.8%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	18.5	50.8	27.6	25.7	45.5
Actuated g/C Ratio	0.21	0.57	0.31	0.29	0.51
v/c Ratio	0.74	0.41	0.71	0.09	0.14
Control Delay	47.0	10.6	31.3	27.8	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	10.6	31.3	27.8	5.5
LOS	D	B	C	C	A
Approach Delay		19.2	31.3	14.5	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 88.4	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	229	750	665	32	69	102
Future Volume (veh/h)	229	750	665	32	69	102
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	249	815	723	35	75	36
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	284	2005	1192	58	838	702
Arrive On Green	0.18	0.59	0.36	0.36	0.28	0.28
Sat Flow, veh/h	1619	3510	3411	161	2956	1530
Grp Volume(v), veh/h	249	815	372	386	75	36
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1772	1478	1530
Q Serve(g_s), s	13.3	11.5	15.9	15.9	1.7	1.2
Cycle Q Clear(g_c), s	13.3	11.5	15.9	15.9	1.7	1.2
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	284	2005	614	636	838	702
V/C Ratio(X)	0.88	0.41	0.61	0.61	0.09	0.05
Avail Cap(c_a), veh/h	681	3200	792	821	838	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	10.0	23.4	23.4	23.4	13.3
Incr Delay (d2), s/veh	3.4	0.2	1.4	1.3	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	5.5	7.7	8.0	0.7	1.4
LnGrp Delay(d),s/veh	39.1	10.2	24.7	24.7	23.6	13.5
LnGrp LOS	D	B	C	C	C	B
Approach Vol, veh/h		1064	758		111	
Approach Delay, s/veh		17.0	24.7		20.3	
Approach LOS		B	C		C	

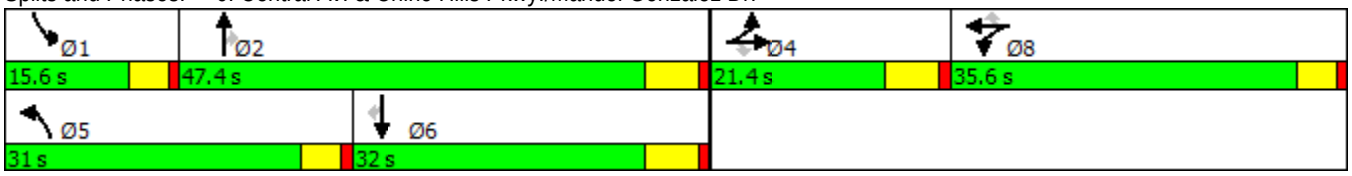
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		57.9		31.0	20.2	37.7		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		83.2		25.2	37.4	41.2		
Max Q Clear Time (g_c+I1), s		13.5		3.7	15.3	17.9		
Green Ext Time (p_c), s		22.8		0.3	0.3	14.0		

Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	54	341	2	3	8	396	864	47	67	724	265
Future Volume (vph)	319	54	341	2	3	8	396	864	47	67	724	265
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	15.9	13.5	13.5	13.5	26.9	47.6	47.6	8.2	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.78	0.74	0.66	0.01	0.01	0.03	0.93	0.54	0.06	0.52	0.81	0.51
Control Delay	61.7	56.9	10.9	35.5	35.3	0.1	64.5	21.6	0.1	57.9	41.4	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	56.9	10.9	35.5	35.3	0.1	64.5	21.6	0.1	57.9	41.4	15.7
LOS	E	E	B	D	D	A	E	C	A	E	D	B
Approach Delay		36.2			12.7			33.8			36.0	
Approach LOS		D			B			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 35.0	Intersection LOS: D
Intersection Capacity Utilization 76.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	319	54	341	2	3	8	396	864	47	67	724	265
Future Volume (veh/h)	319	54	341	2	3	8	396	864	47	67	724	265
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	389	0	275	2	3	4	430	939	39	73	787	233
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	561	0	265	36	40	34	458	1769	775	91	995	439
Arrive On Green	0.17	0.00	0.17	0.02	0.02	0.02	0.28	0.52	0.52	0.06	0.29	0.29
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1510
Grp Volume(v), veh/h	389	0	275	2	3	4	430	939	39	73	787	233
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1510
Q Serve(g_s), s	10.2	0.0	15.6	0.1	0.1	0.2	23.4	16.5	1.2	4.0	19.1	11.7
Cycle Q Clear(g_c), s	10.2	0.0	15.6	0.1	0.1	0.2	23.4	16.5	1.2	4.0	19.1	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	561	0	265	36	40	34	458	1769	775	91	995	439
V/C Ratio(X)	0.69	0.00	1.04	0.06	0.07	0.12	0.94	0.53	0.05	0.80	0.79	0.53
Avail Cap(c_a), veh/h	561	0	265	557	619	527	474	1769	775	198	995	439
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	0.0	37.2	43.1	43.1	43.2	31.6	14.5	10.8	42.0	29.4	26.8
Incr Delay (d2), s/veh	3.7	0.0	65.5	0.6	0.8	1.5	25.9	1.1	0.1	6.0	6.4	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	11.4	0.1	0.1	0.1	13.7	8.0	0.5	2.0	9.8	5.4
LnGrp Delay(d),s/veh	38.7	0.0	102.7	43.7	43.9	44.7	57.5	15.6	10.9	48.0	35.8	31.3
LnGrp LOS	D		F	D	D	D	E	B	B	D	D	C
Approach Vol, veh/h		664			9			1408			1093	
Approach Delay, s/veh		65.2			44.2			28.3			35.7	
Approach LOS		E			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	52.4		21.4	30.1	32.0		6.6
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	6.0	18.5		17.6	25.4	21.1		2.2
Green Ext Time (p_c), s	0.0	17.0		0.0	0.1	4.5		0.0

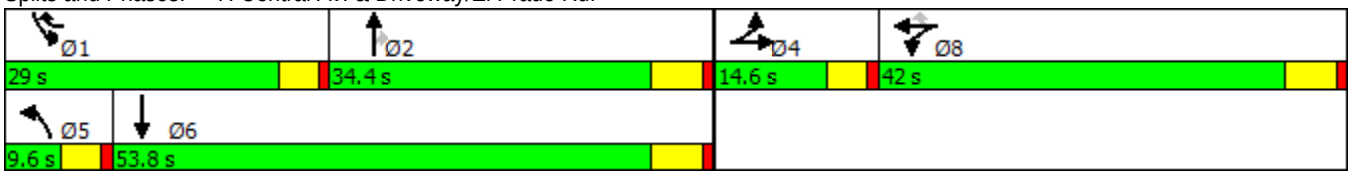
Intersection Summary	
HCM 2010 Ctrl Delay	38.6
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1085	3	537	2	798	802	498	652
Future Volume (vph)	1	1	1085	3	537	2	798	802	498	652
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	42.0	42.0	29.0	9.6	34.4	34.4	29.0	53.8
Total Split (%)	12.2%	12.2%	35.0%	35.0%	24.2%	8.0%	28.7%	28.7%	24.2%	44.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	36.3	36.3	66.6	5.0	28.7	28.7	24.5	56.0
Actuated g/C Ratio	0.09	0.09	0.34	0.34	0.61	0.05	0.27	0.27	0.23	0.52
v/c Ratio	0.01	0.01	1.18	1.11	0.57	0.03	0.98	0.92	1.52	0.29
Control Delay	48.0	41.0	131.6	107.7	8.9	53.0	65.7	22.4	278.9	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	131.6	107.7	8.9	53.0	65.7	22.4	278.9	16.4
LOS	D	D	F	F	A	D	E	C	F	B
Approach Delay		43.3		83.0			44.0			129.1
Approach LOS		D		F			D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.52	
Intersection Signal Delay: 80.9	Intersection LOS: F
Intersection Capacity Utilization 107.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1085	3	537	2	798	802	498	652	10
Future Volume (veh/h)	1	1	1	1085	3	537	2	798	802	498	652	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1208	0	454	2	887	722	553	724	9
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1057	0	836	4	882	390	356	2378	30
Arrive On Green	0.01	0.01	0.01	0.33	0.00	0.33	0.00	0.26	0.26	0.22	0.48	0.48
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	1619	5003	62
Grp Volume(v), veh/h	1	0	2	1208	0	454	2	887	722	553	474	259
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1619	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	36.2	0.0	21.2	0.1	28.6	28.6	24.4	9.8	9.9
Cycle Q Clear(g_c), s	0.1	0.0	0.1	36.2	0.0	21.2	0.1	28.6	28.6	24.4	9.8	9.9
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1057	0	836	4	882	390	356	1557	850
V/C Ratio(X)	0.08	0.00	0.15	1.14	0.00	0.54	0.46	1.01	1.85	1.55	0.30	0.30
Avail Cap(c_a), veh/h	146	0	149	1057	0	836	73	882	390	356	1557	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	37.3	0.0	16.2	55.2	41.1	41.1	43.2	17.8	17.8
Incr Delay (d2), s/veh	0.9	0.0	2.0	75.8	0.0	0.7	25.4	31.7	393.8	261.9	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	27.1	0.0	9.0	0.1	17.2	54.4	36.7	4.5	5.0
LnGrp Delay(d),s/veh	55.5	0.0	56.6	113.1	0.0	16.9	80.6	72.8	434.9	305.2	18.4	18.8
LnGrp LOS	E		E	F		B	F	F	F	F	B	B
Approach Vol, veh/h		3			1662			1611			1286	
Approach Delay, s/veh		56.2			86.8			235.1			141.8	
Approach LOS		E			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	34.4		5.5	4.9	58.5		42.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	24.4	28.6		10.0	5.0	48.0		36.2
Max Q Clear Time (g_c+I1), s	26.4	30.6		2.1	2.1	11.9		38.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	26.1		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		154.7
HCM 2010 LOS		F

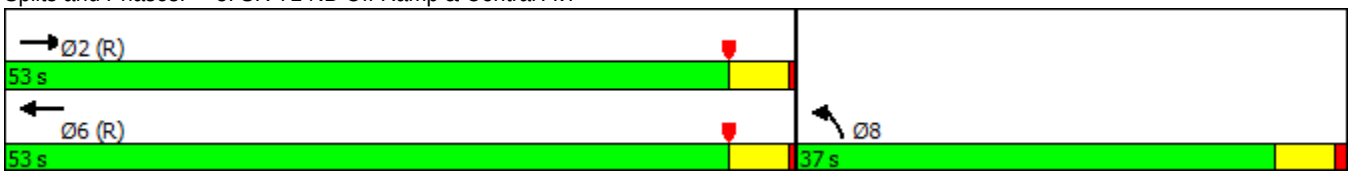
Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1310	914	105
Future Volume (vph)	1310	914	105
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	53.0	53.0	37.0
Total Split (%)	58.9%	58.9%	41.1%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	57.6	57.6	22.9
Actuated g/C Ratio	0.64	0.64	0.25
v/c Ratio	0.91dr	0.35	1.22dr
Control Delay	10.6	8.4	38.9
Queue Delay	0.0	0.0	0.0
Total Delay	10.6	8.4	38.9
LOS	B	A	D
Approach Delay	10.6	8.4	38.9
Approach LOS	B	A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1310	826	0	914	105	393
Future Volume (veh/h)	1310	826	0	914	105	393
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1578	995	0	1101	127	280
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2255	1053	0	3382	334	316
Arrive On Green	1.00	1.00	0.00	0.69	0.21	0.21
Sat Flow, veh/h	3438	1530	0	5238	1619	1530
Grp Volume(v), veh/h	1578	995	0	1101	127	280
Grp Sat Flow(s),veh/h/ln	1638	1530	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	8.1	6.1	16.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	8.1	6.1	16.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2255	1053	0	3382	334	316
V/C Ratio(X)	0.70	0.94	0.00	0.33	0.38	0.89
Avail Cap(c_a), veh/h	2255	1053	0	3382	576	544
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.6	30.8	34.7
Incr Delay (d2), s/veh	1.8	17.3	0.0	0.3	0.3	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.1	0.0	3.6	2.7	7.2
LnGrp Delay(d),s/veh	1.8	17.3	0.0	5.9	31.0	39.1
LnGrp LOS	A	B		A	C	D
Approach Vol, veh/h	2573			1101	407	
Approach Delay, s/veh	7.8			5.9	36.6	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		66.4				66.4		23.6
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		48.5				48.5		32.0
Max Q Clear Time (g_c+I1), s		2.0				10.1		18.0
Green Ext Time (p_c), s		33.4				29.0		0.6

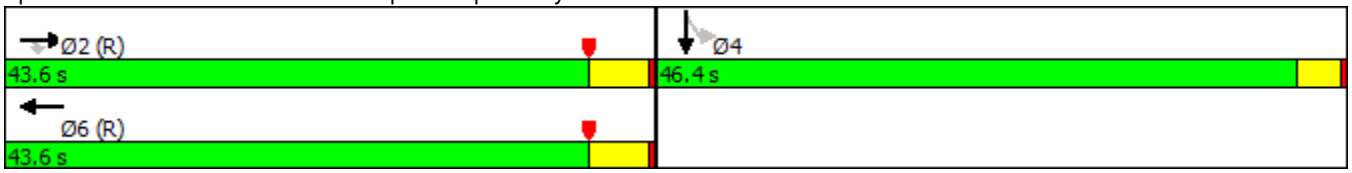
Intersection Summary	
HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1450	75	810	686	0
Future Volume (vph)	1450	75	810	686	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	43.6	43.6	43.6	46.4	46.4
Total Split (%)	48.4%	48.4%	48.4%	51.6%	51.6%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	39.8	39.8	39.8	42.2	42.2
Actuated g/C Ratio	0.44	0.44	0.44	0.47	0.47
v/c Ratio	0.84	0.13	0.60	0.97	0.89
Control Delay	27.2	3.9	14.0	51.0	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	3.9	14.0	51.0	36.3
LOS	C	A	B	D	D
Approach Delay	26.0		14.0		43.9
Approach LOS	C		B		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 68.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	✣	
Traffic Volume (veh/h)	0	1450	75	0	810	208	0	0	0	686	0	372
Future Volume (veh/h)	0	1450	75	0	810	208	0	0	0	686	0	372
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1835	0	0	1025	263				599	376	330
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2271	707	0	1802	462				727	398	349
Arrive On Green	0.00	0.46	0.00	0.00	0.92	0.92				0.45	0.45	0.45
Sat Flow, veh/h	0	5076	1530	0	4062	1000				1619	886	777
Grp Volume(v), veh/h	0	1835	0	0	861	427				599	0	706
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1624				1619	0	1663
Q Serve(g_s), s	0.0	28.9	0.0	0.0	3.8	3.8				29.1	0.0	36.6
Cycle Q Clear(g_c), s	0.0	28.9	0.0	0.0	3.8	3.8				29.1	0.0	36.6
Prop In Lane	0.00		1.00	0.00		0.62				1.00		0.47
Lane Grp Cap(c), veh/h	0	2271	707	0	1514	750				727	0	747
V/C Ratio(X)	0.00	0.81	0.00	0.00	0.57	0.57				0.82	0.00	0.95
Avail Cap(c_a), veh/h	0	2271	707	0	1514	750				772	0	793
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.8	0.0	0.0	2.0	2.0				21.7	0.0	23.7
Incr Delay (d2), s/veh	0.0	3.2	0.0	0.0	1.6	3.1				6.3	0.0	18.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.6	0.0	0.0	1.7	2.1				14.3	0.0	20.6
LnGrp Delay(d),s/veh	0.0	24.0	0.0	0.0	3.5	5.1				28.0	0.0	42.6
LnGrp LOS		C			A	A				C		D
Approach Vol, veh/h		1835			1288						1305	
Approach Delay, s/veh		24.0			4.1						35.9	
Approach LOS		C			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		46.1		43.9		46.1		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		30.9		38.6		5.8		
Green Ext Time (p_c), s		7.5		1.8		24.7		

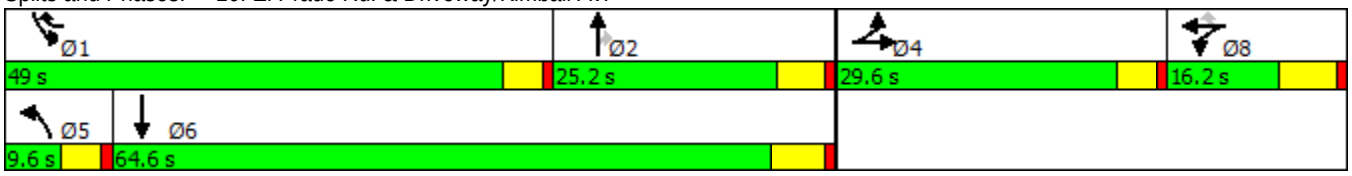
Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	1	27	1333	5	293	33	939	213
Future Volume (vph)	12	1	27	1333	5	293	33	939	213
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	49.0	9.6	25.2	25.2	49.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	40.8%	8.0%	21.0%	21.0%	40.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	58.0	5.1	20.5	20.5	45.6	60.4
Actuated g/C Ratio	0.13	0.13	0.11	0.60	0.05	0.21	0.21	0.48	0.63
v/c Ratio	0.06	0.01	0.31	1.16	0.06	0.78	0.08	1.25	0.12
Control Delay	40.2	30.3	50.1	97.7	52.6	54.0	0.3	150.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.3	50.1	97.7	52.6	54.0	0.3	150.0	9.4
LOS	D	C	D	F	D	D	A	F	A
Approach Delay		38.2	95.8			48.6			119.8
Approach LOS		D	F			D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.25	
Intersection Signal Delay: 100.0	Intersection LOS: F
Intersection Capacity Utilization 123.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	2	29	27	1333	5	293	33	939	213	44
Future Volume (veh/h)	12	1	2	29	27	1333	5	293	33	939	213	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	1	1	30	28	499	5	299	34	958	217	45
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	52	27	27	93	87	856	83	342	290	740	1685	343
Arrive On Green	0.03	0.03	0.03	0.10	0.10	0.10	0.05	0.19	0.19	0.46	0.60	0.60
Sat Flow, veh/h	1619	827	827	908	847	1530	1619	1800	1530	1619	2831	576
Grp Volume(v), veh/h	12	0	2	58	0	499	5	299	34	958	129	133
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1619	1710	1698
Q Serve(g_s), s	0.7	0.0	0.1	3.0	0.0	10.0	0.3	15.7	1.8	44.4	3.2	3.3
Cycle Q Clear(g_c), s	0.7	0.0	0.1	3.0	0.0	10.0	0.3	15.7	1.8	44.4	3.2	3.3
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	52	0	54	181	0	856	83	342	290	740	1018	1010
V/C Ratio(X)	0.23	0.00	0.04	0.32	0.00	0.58	0.06	0.88	0.12	1.30	0.13	0.13
Avail Cap(c_a), veh/h	416	0	425	181	0	856	83	370	315	740	1035	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	0.0	45.6	40.4	0.0	14.0	43.9	38.3	32.6	26.4	8.6	8.6
Incr Delay (d2), s/veh	2.2	0.0	0.3	1.0	0.0	1.0	0.1	19.2	0.2	142.8	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	1.5	0.0	8.9	0.1	9.6	0.8	49.1	1.5	1.6
LnGrp Delay(d),s/veh	48.0	0.0	45.8	41.5	0.0	15.0	44.0	57.5	32.8	169.2	8.7	8.7
LnGrp LOS	D		D	D		B	D	E	C	F	A	A
Approach Vol, veh/h		14			557			338			1220	
Approach Delay, s/veh		47.7			17.7			54.8			134.7	
Approach LOS		D			B			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	49.0	24.2		7.7	9.6	63.6		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	44.4	* 20		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	46.4	17.7		2.7	2.3	5.3		12.0
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	3.4		0.0

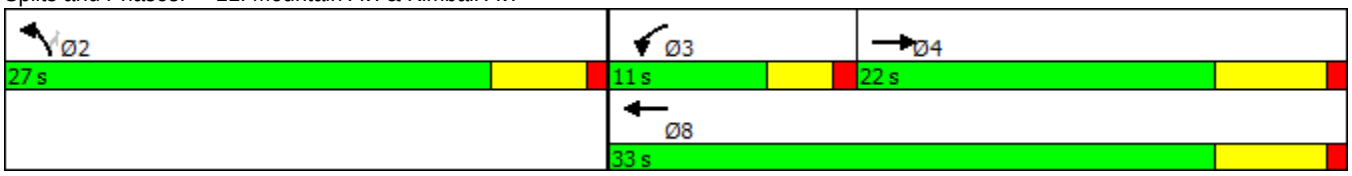
Intersection Summary	
HCM 2010 Ctrl Delay	90.9
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	859	135	1153	283	51
Future Volume (vph)	859	135	1153	283	51
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	11.0	33.0	27.0	27.0
Total Split (%)	36.7%	18.3%	55.0%	45.0%	45.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	16.5	7.2	24.8	13.1	13.1
Actuated g/C Ratio	0.33	0.15	0.50	0.26	0.26
v/c Ratio	0.91	0.60	0.70	0.69	0.12
Control Delay	33.2	37.5	13.0	25.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	37.5	13.0	25.9	5.4
LOS	C	D	B	C	A
Approach Delay	33.2		15.6	22.8	
Approach LOS	C		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 49.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	859	131	135	1153	283	51
Future Volume (veh/h)	859	131	135	1153	283	51
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	895	131	141	1201	295	48
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	999	146	201	1854	357	338
Arrive On Green	0.33	0.33	0.12	0.54	0.22	0.22
Sat Flow, veh/h	3084	438	1619	3510	1619	1530
Grp Volume(v), veh/h	511	515	141	1201	295	48
Grp Sat Flow(s),veh/h/ln	1710	1723	1619	1710	1619	1530
Q Serve(g_s), s	13.5	13.5	4.0	11.8	8.3	1.2
Cycle Q Clear(g_c), s	13.5	13.5	4.0	11.8	8.3	1.2
Prop In Lane		0.25	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	571	575	201	1854	357	338
V/C Ratio(X)	0.90	0.90	0.70	0.65	0.83	0.14
Avail Cap(c_a), veh/h	575	579	238	1939	738	697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	15.1	20.0	7.7	17.7	14.9
Incr Delay (d2), s/veh	16.0	16.0	5.1	0.5	1.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	8.8	2.0	5.6	3.9	0.5
LnGrp Delay(d),s/veh	31.1	31.0	25.1	8.2	19.5	15.0
LnGrp LOS	C	C	C	A	B	B
Approach Vol, veh/h	1026			1342	343	
Approach Delay, s/veh	31.1			10.0	18.9	
Approach LOS	C			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		15.8	9.9	21.9				31.8
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		21.7	7.0	16.0				27.0
Max Q Clear Time (g_c+I1), s		10.3	6.0	15.5				13.8
Green Ext Time (p_c), s		0.2	0.0	0.4				6.0

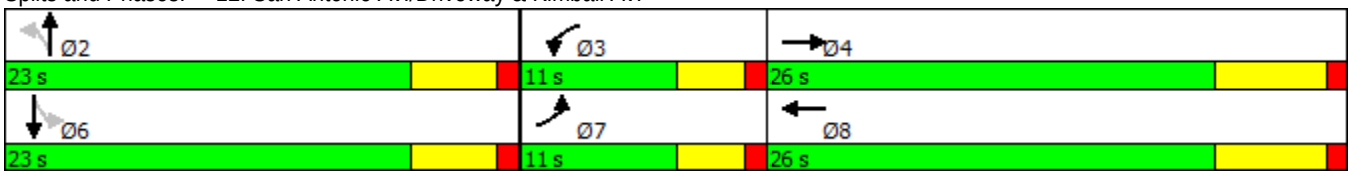
Intersection Summary	
HCM 2010 Ctrl Delay	19.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	789	38	1292	65	0	46	0
Future Volume (vph)	38	789	38	1292	65	0	46	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	26.0	11.0	26.0	23.0	23.0	23.0	23.0
Total Split (%)	18.3%	43.3%	18.3%	43.3%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.3	20.7	7.3	20.7	9.0	9.0	9.0	9.0
Actuated g/C Ratio	0.16	0.46	0.16	0.46	0.20	0.20	0.20	0.20
v/c Ratio	0.15	0.58	0.15	0.88	0.27	0.03	0.19	0.01
Control Delay	21.7	13.1	21.7	24.0	19.0	0.1	17.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	13.1	21.7	24.0	19.0	0.1	17.9	0.0
LOS	C	B	C	C	B	A	B	A
Approach Delay		13.5		24.0		15.4		16.2
Approach LOS		B		C		B		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 44.7
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 19.6 — Intersection LOS: B
Intersection Capacity Utilization 58.1% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	789	67	38	1292	18	65	0	15	46	0	5
Future Volume (veh/h)	38	789	67	38	1292	18	65	0	15	46	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	40	839	71	40	1374	19	69	0	13	49	0	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1409	119	100	1528	21	374	0	243	367	0	243
Arrive On Green	0.06	0.44	0.44	0.06	0.44	0.44	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	1619	3186	270	1619	3454	48	1354	0	1530	1344	0	1530
Grp Volume(v), veh/h	40	450	460	40	680	713	69	0	13	49	0	5
Grp Sat Flow(s),veh/h/ln	1619	1710	1746	1619	1710	1792	1354	0	1530	1344	0	1530
Q Serve(g_s), s	1.0	8.8	8.8	1.0	16.2	16.3	2.0	0.0	0.3	1.4	0.0	0.1
Cycle Q Clear(g_c), s	1.0	8.8	8.8	1.0	16.2	16.3	2.1	0.0	0.3	1.7	0.0	0.1
Prop In Lane	1.00		0.15	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	756	772	100	756	792	374	0	243	367	0	243
V/C Ratio(X)	0.40	0.60	0.60	0.40	0.90	0.90	0.18	0.00	0.05	0.13	0.00	0.02
Avail Cap(c_a), veh/h	257	775	791	257	775	812	715	0	628	705	0	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	9.3	9.3	19.9	11.4	11.4	16.6	0.0	15.8	16.5	0.0	15.7
Incr Delay (d2), s/veh	1.0	0.8	0.8	1.0	12.8	12.4	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.3	4.4	0.5	10.2	10.7	0.8	0.0	0.1	0.5	0.0	0.1
LnGrp Delay(d),s/veh	20.9	10.1	10.1	20.9	24.2	23.8	16.7	0.0	15.8	16.6	0.0	15.7
LnGrp LOS	C	B	B	C	C	C	B		B	B		B
Approach Vol, veh/h		950			1433			82			54	
Approach Delay, s/veh		10.6			23.9			16.5			16.5	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	6.7	25.5		11.9	6.7	25.5
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	20.0		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		4.1	3.0	10.8		3.7	3.0	18.3
Green Ext Time (p_c), s		0.1	0.0	4.7		0.1	0.0	1.2

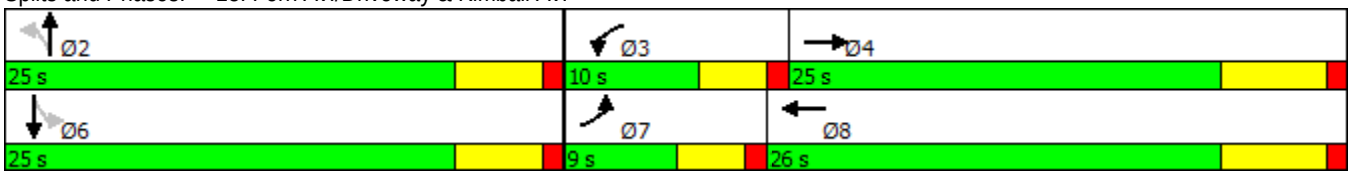
Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	37	734	40	1340	47	0	65	1
Future Volume (vph)	37	734	40	1340	47	0	65	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	10.0	26.0	25.0	25.0	25.0	25.0
Total Split (%)	15.0%	41.7%	16.7%	43.3%	41.7%	41.7%	41.7%	41.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	20.8	5.5	21.2	8.1	8.1	8.1	8.1
Actuated g/C Ratio	0.12	0.48	0.13	0.49	0.19	0.19	0.19	0.19
v/c Ratio	0.21	0.55	0.21	0.91	0.22	0.06	0.31	0.03
Control Delay	24.4	12.6	23.5	25.2	17.4	0.2	19.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	12.6	23.5	25.2	17.4	0.2	19.0	9.6
LOS	C	B	C	C	B	A	B	A
Approach Delay		13.1		25.1		11.1		17.8
Approach LOS		B		C		B		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 43.3
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 20.2 — Intersection LOS: C
Intersection Capacity Utilization 59.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	734	69	40	1340	20	47	0	27	65	1	8
Future Volume (veh/h)	37	734	69	40	1340	20	47	0	27	65	1	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	41	816	70	44	1489	22	52	0	20	72	1	8
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	74	1512	130	78	1649	24	332	0	186	322	21	168
Arrive On Green	0.05	0.48	0.48	0.05	0.48	0.48	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1619	3182	273	1619	3450	51	1349	0	1530	1336	173	1383
Grp Volume(v), veh/h	41	438	448	44	737	774	52	0	20	72	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1745	1619	1710	1791	1349	0	1530	1336	0	1556
Q Serve(g_s), s	1.0	7.4	7.4	1.1	16.3	16.3	1.5	0.0	0.5	2.1	0.0	0.2
Cycle Q Clear(g_c), s	1.0	7.4	7.4	1.1	16.3	16.3	1.7	0.0	0.5	2.6	0.0	0.2
Prop In Lane	1.00		0.16	1.00		0.03	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	74	813	829	78	817	856	332	0	186	322	0	189
V/C Ratio(X)	0.56	0.54	0.54	0.57	0.90	0.90	0.16	0.00	0.11	0.22	0.00	0.05
Avail Cap(c_a), veh/h	197	813	829	236	844	884	828	0	748	813	0	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.2	7.6	7.6	19.2	9.9	9.9	16.7	0.0	16.1	17.2	0.0	16.0
Incr Delay (d2), s/veh	2.4	0.4	0.4	2.4	12.2	11.9	0.1	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.5	3.6	0.5	10.4	10.8	0.5	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	21.6	8.0	8.0	21.5	22.1	21.8	16.8	0.0	16.2	17.3	0.0	16.0
LnGrp LOS	C	A	A	C	C	C	B		B	B		B
Approach Vol, veh/h		927			1555			72			81	
Approach Delay, s/veh		8.6			21.9			16.6			17.2	
Approach LOS		A			C			B			B	

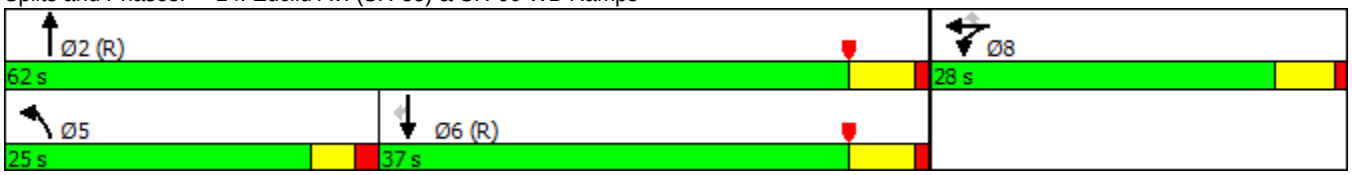
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.9	6.0	25.2		9.9	5.9	25.3
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.1	6.0	19.3		20.1	5.0	20.3
Max Q Clear Time (g_c+I1), s		3.7	3.1	9.4		4.6	3.0	18.3
Green Ext Time (p_c), s		0.2	0.0	5.1		0.1	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	17.0
HCM 2010 LOS	B

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	843	2	393	478	1004	1090	499
Future Volume (vph)	843	2	393	478	1004	1090	499
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.0	23.0	23.0	20.5	56.5	31.5	31.5
Actuated g/C Ratio	0.26	0.26	0.26	0.23	0.63	0.35	0.35
v/c Ratio	1.22	1.18	0.84	1.40	0.50	0.98	0.63
Control Delay	153.7	135.5	41.5	209.9	22.2	51.6	5.7
Queue Delay	0.0	0.0	0.0	0.0	3.3	7.1	0.0
Total Delay	153.7	135.5	41.5	209.9	25.5	58.7	5.7
LOS	F	F	D	F	C	E	A
Approach Delay		115.1			85.0	42.1	
Approach LOS		F			F	D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.40	
Intersection Signal Delay: 77.8	Intersection LOS: E
Intersection Capacity Utilization 144.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	843	2	393	478	1004	0	0	1090	499
Future Volume (veh/h)	0	0	0	843	2	393	478	1004	0	0	1090	499
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				990	0	179	514	1080	0	0	1172	537
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				828	0	391	369	2147	0	0	1197	515
Arrive On Green				0.26	0.00	0.26	0.46	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3238	0	1530	1619	3510	0	0	3510	1473
Grp Volume(v), veh/h				990	0	179	514	1080	0	0	1172	537
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1619	1710	0	0	1710	1473
Q Serve(g_s), s				23.0	0.0	8.9	20.5	0.0	0.0	0.0	30.5	31.5
Cycle Q Clear(g_c), s				23.0	0.0	8.9	20.5	0.0	0.0	0.0	30.5	31.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				828	0	391	369	2147	0	0	1197	515
V/C Ratio(X)				1.20	0.00	0.46	1.39	0.50	0.00	0.00	0.98	1.04
Avail Cap(c_a), veh/h				828	0	391	369	2147	0	0	1197	515
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.17	0.17	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.5	0.0	28.2	24.5	0.0	0.0	0.0	28.9	29.3
Incr Delay (d2), s/veh				100.1	0.0	0.3	180.0	0.1	0.0	0.0	21.5	51.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				21.7	0.0	3.8	27.5	0.0	0.0	0.0	17.9	20.0
LnGrp Delay(d),s/veh				133.6	0.0	28.6	204.5	0.1	0.0	0.0	50.4	80.2
LnGrp LOS				F		C	F	A			D	F
Approach Vol, veh/h					1169			1594			1709	
Approach Delay, s/veh					117.5			66.0			59.8	
Approach LOS					F			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			25.0	37.0		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			22.5	33.5		25.0
Green Ext Time (p_c), s		44.3			0.0	0.0		0.0

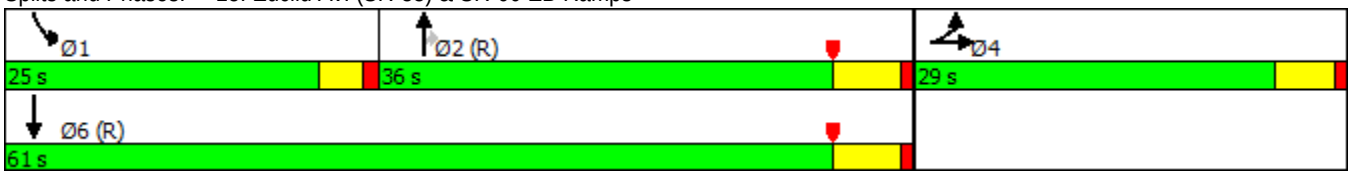
Intersection Summary	
HCM 2010 Ctrl Delay	77.1
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	351	0	1131	677	311	1623
Future Volume (vph)	351	0	1131	677	311	1623
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	31.4	31.4	20.1	55.5
Actuated g/C Ratio	0.27	0.27	0.35	0.35	0.22	0.62
v/c Ratio	0.82	1.72	1.01	0.76	0.92	0.82
Control Delay	49.3	357.5	59.4	9.3	44.3	7.1
Queue Delay	13.2	1.3	0.0	0.0	0.0	14.3
Total Delay	62.5	358.8	59.4	9.3	44.3	21.4
LOS	E	F	E	A	D	C
Approach Delay		268.9	40.6			25.1
Approach LOS		F	D			C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.72	
Intersection Signal Delay: 84.0	Intersection LOS: F
Intersection Capacity Utilization 144.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	351	0	690	0	0	0	0	1131	677	311	1623	0
Future Volume (veh/h)	351	0	690	0	0	0	0	1131	677	311	1623	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	373	0	651				0	1203	720	331	1727	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	432	0	408				0	1201	534	358	2109	0
Arrive On Green	0.27	0.00	0.27				0.00	0.35	0.35	0.29	0.82	0.00
Sat Flow, veh/h	1619	0	1530				0	3510	1521	1619	3510	0
Grp Volume(v), veh/h	373	0	651				0	1203	720	331	1727	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1521	1619	1710	0
Q Serve(g_s), s	19.8	0.0	24.0				0.0	31.6	31.6	17.8	24.9	0.0
Cycle Q Clear(g_c), s	19.8	0.0	24.0				0.0	31.6	31.6	17.8	24.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	408				0	1201	534	358	2109	0
V/C Ratio(X)	0.86	0.00	1.60				0.00	1.00	1.35	0.92	0.82	0.00
Avail Cap(c_a), veh/h	432	0	408				0	1201	534	378	2109	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.66	0.66	0.09	0.09	0.00
Uniform Delay (d), s/veh	31.4	0.0	33.0				0.0	29.2	29.2	31.0	5.3	0.0
Incr Delay (d2), s/veh	15.8	0.0	279.4				0.0	21.7	164.9	3.8	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	0.0	41.7				0.0	18.5	37.7	8.3	11.2	0.0
LnGrp Delay(d),s/veh	47.2	0.0	312.4				0.0	50.9	194.1	34.9	5.7	0.0
LnGrp LOS	D		F					F	F	C	A	
Approach Vol, veh/h		1024						1923			2058	
Approach Delay, s/veh		215.8						104.5			10.4	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.9	37.1		29.0		61.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	19.8	33.6		26.0		26.9		
Green Ext Time (p_c), s	0.1	0.0		0.0		27.8		

Intersection Summary	
HCM 2010 Ctrl Delay	88.6
HCM 2010 LOS	F

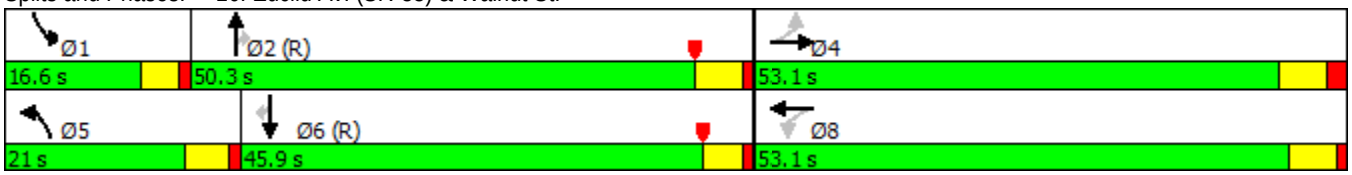
Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	159	352	103	326	120	1445	57	167	1854	61
Future Volume (vph)	159	352	103	326	120	1445	57	167	1854	61
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	36.5	36.5	37.5	37.5	13.8	56.5	56.5	10.9	54.0	54.0
Actuated g/C Ratio	0.30	0.30	0.31	0.31	0.12	0.47	0.47	0.09	0.45	0.45
v/c Ratio	0.98	0.48	0.55	0.50	0.68	0.66	0.08	0.66	0.88	0.09
Control Delay	105.1	31.1	42.5	26.9	54.2	26.1	6.6	64.7	37.9	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.1	31.1	42.5	26.9	54.2	26.1	6.6	64.7	37.9	5.6
LOS	F	C	D	C	D	C	A	E	D	A
Approach Delay		49.8		29.5		27.5			39.1	
Approach LOS		D		C		C			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 35.5 — Intersection LOS: D
Intersection Capacity Utilization 89.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	352	117	103	326	182	120	1445	57	167	1854	61
Future Volume (veh/h)	159	352	117	103	326	182	120	1445	57	167	1854	61
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	167	371	101	108	343	159	126	1521	41	176	1952	35
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	264	947	255	280	807	367	151	2138	666	224	2034	632
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.03	0.14	0.14	0.08	0.41	0.41
Sat Flow, veh/h	859	2666	717	884	2274	1033	1619	4914	1530	2956	4914	1528
Grp Volume(v), veh/h	167	236	236	108	256	246	126	1521	41	176	1952	35
Grp Sat Flow(s),veh/h/ln	859	1710	1673	884	1710	1597	1619	1638	1530	1478	1638	1528
Q Serve(g_s), s	22.1	12.4	12.7	12.5	13.6	14.1	9.3	35.4	2.8	7.0	46.4	1.6
Cycle Q Clear(g_c), s	36.1	12.4	12.7	25.2	13.6	14.1	9.3	35.4	2.8	7.0	46.4	1.6
Prop In Lane	1.00		0.43	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	607	594	280	607	567	151	2138	666	224	2034	632
V/C Ratio(X)	0.63	0.39	0.40	0.39	0.42	0.43	0.83	0.71	0.06	0.79	0.96	0.06
Avail Cap(c_a), veh/h	294	667	652	319	681	636	217	2138	666	298	2034	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.47	0.47	0.47
Uniform Delay (d), s/veh	43.3	29.0	29.0	38.5	29.4	29.5	57.2	44.2	30.2	54.5	34.2	21.1
Incr Delay (d2), s/veh	3.7	0.4	0.4	0.9	0.5	0.5	6.0	0.7	0.1	3.3	7.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	5.9	5.9	3.1	6.5	6.3	4.4	16.2	1.2	3.0	22.3	0.7
LnGrp Delay(d),s/veh	47.0	29.4	29.5	39.4	29.8	30.0	63.3	44.9	30.3	57.8	41.3	21.2
LnGrp LOS	D	C	C	D	C	C	E	D	C	E	D	C
Approach Vol, veh/h		639			610			1688			2163	
Approach Delay, s/veh		34.0			31.6			45.9			42.3	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.6	57.5		48.9	16.1	55.0		48.9
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	9.0	37.4		38.1	11.3	48.4		27.2
Green Ext Time (p_c), s	0.1	7.2		4.5	0.1	0.0		7.2

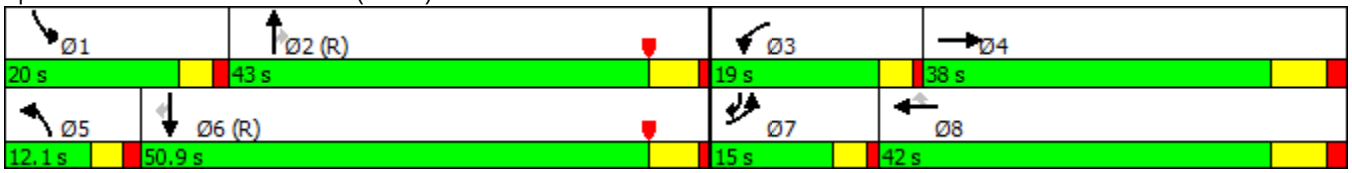
Intersection Summary	
HCM 2010 Ctrl Delay	41.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	150	344	193	404	53	67	1039	180	189	1273	156
Future Volume (vph)	150	344	193	404	53	67	1039	180	189	1273	156
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	15.0	38.0	19.0	42.0	42.0	12.1	43.0	43.0	20.0	50.9	15.0
Total Split (%)	12.5%	31.7%	15.8%	35.0%	35.0%	10.1%	35.8%	35.8%	16.7%	42.4%	12.5%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.0	21.7	15.0	25.7	25.7	9.9	42.0	42.0	20.3	54.6	71.1
Actuated g/C Ratio	0.09	0.18	0.12	0.21	0.21	0.08	0.35	0.35	0.17	0.46	0.59
v/c Ratio	1.07	0.69	1.01	0.58	0.13	0.53	0.91	0.30	0.73	0.86	0.17
Control Delay	144.8	49.8	118.5	45.1	0.6	86.9	34.3	4.0	80.2	15.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	144.8	49.8	118.5	45.1	0.6	86.9	34.3	4.0	80.2	15.1	0.2
LOS	F	D	F	D	A	F	C	A	F	B	A
Approach Delay		75.6		63.2			32.8			21.3	
Approach LOS		E		E			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 38.8	Intersection LOS: D
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	344	60	193	404	53	67	1039	180	189	1273	156
Future Volume (veh/h)	150	344	60	193	404	53	67	1039	180	189	1273	156
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	158	362	40	203	425	51	71	1094	108	199	1340	98
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	148	553	61	202	723	323	88	1343	601	209	1599	856
Arrive On Green	0.09	0.18	0.18	0.13	0.21	0.21	0.07	0.52	0.52	0.17	0.62	0.62
Sat Flow, veh/h	1619	3103	341	1619	3420	1528	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	158	198	204	203	425	51	71	1094	108	199	1340	98
Grp Sat Flow(s),veh/h/ln	1619	1710	1734	1619	1710	1528	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	11.0	12.9	13.1	15.0	13.4	3.3	5.2	31.9	4.5	14.6	37.1	2.6
Cycle Q Clear(g_c), s	11.0	12.9	13.1	15.0	13.4	3.3	5.2	31.9	4.5	14.6	37.1	2.6
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	305	309	202	723	323	88	1343	601	209	1599	856
V/C Ratio(X)	1.06	0.65	0.66	1.00	0.59	0.16	0.81	0.81	0.18	0.95	0.84	0.11
Avail Cap(c_a), veh/h	148	442	448	202	998	446	103	1343	601	209	1599	856
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.63	0.63	0.38	0.38	0.38
Uniform Delay (d), s/veh	54.5	45.8	45.9	52.5	42.6	38.6	55.1	25.0	18.5	49.3	19.1	8.7
Incr Delay (d2), s/veh	92.1	3.3	3.4	64.1	1.1	0.3	22.4	3.6	0.4	26.9	2.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	6.4	6.6	10.3	6.4	1.4	2.9	15.7	1.9	8.0	17.6	1.1
LnGrp Delay(d),s/veh	146.6	49.2	49.3	116.6	43.7	38.9	77.4	28.6	18.9	76.2	21.3	8.8
LnGrp LOS	F	D	D	F	D	D	E	C	B	E	C	A
Approach Vol, veh/h		560			679			1273			1637	
Approach Delay, s/veh		76.7			65.1			30.5			27.2	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	52.6	19.0	28.4	11.0	61.6	15.0	32.4
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	37.5	15.0	31.0	7.6	45.4	11.0	35.0
Max Q Clear Time (g_c+I1), s	16.6	33.9	17.0	15.1	7.2	39.1	13.0	15.4
Green Ext Time (p_c), s	0.0	3.3	0.0	6.0	0.0	5.7	0.0	6.7

Intersection Summary	
HCM 2010 Ctrl Delay	41.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	105	128	77	70	168	74	1414	144	30	1886	102
Future Volume (vph)	105	128	77	70	168	74	1414	144	30	1886	102
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	27.4	27.4	27.4		27.4	9.9	72.9	72.9	6.7	68.0	68.0
Actuated g/C Ratio	0.23	0.23	0.23		0.23	0.08	0.61	0.61	0.06	0.57	0.57
v/c Ratio	0.66	0.33	0.20		0.83	0.59	0.72	0.16	0.36	1.02	0.12
Control Delay	60.0	39.1	6.3		62.2	67.1	20.2	4.4	47.8	65.4	14.0
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	39.1	6.3		62.2	67.1	20.2	4.4	47.8	65.4	14.0
LOS	E	D	A		E	E	C	A	D	E	B
Approach Delay		38.1			62.2		20.9			62.5	
Approach LOS		D			E		C			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 44.7	Intersection LOS: D
Intersection Capacity Utilization 102.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	128	77	70	168	38	74	1414	144	30	1886	102
Future Volume (veh/h)	105	128	77	70	168	38	74	1414	144	30	1886	102
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	111	135	57	74	177	36	78	1488	116	32	1985	78
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	206	429	360	109	225	43	96	2042	913	44	1933	864
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.12	1.00	1.00	0.02	0.38	0.38
Sat Flow, veh/h	1121	1800	1510	299	946	179	1619	3420	1530	1619	3420	1529
Grp Volume(v), veh/h	111	135	57	287	0	0	78	1488	116	32	1985	78
Grp Sat Flow(s),veh/h/ln	1121	1800	1510	1424	0	0	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	0.7	7.4	3.6	16.3	0.0	0.0	5.6	0.0	0.0	2.4	67.8	3.9
Cycle Q Clear(g_c), s	24.4	7.4	3.6	23.7	0.0	0.0	5.6	0.0	0.0	2.4	67.8	3.9
Prop In Lane	1.00		1.00	0.26		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	206	429	360	377	0	0	96	2042	913	44	1933	864
V/C Ratio(X)	0.54	0.31	0.16	0.76	0.00	0.00	0.81	0.73	0.13	0.72	1.03	0.09
Avail Cap(c_a), veh/h	285	555	466	487	0	0	169	2042	913	101	1933	864
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.48	0.48	0.48	0.36	0.36	0.36
Uniform Delay (d), s/veh	44.5	37.7	36.2	44.5	0.0	0.0	52.3	0.0	0.0	58.5	37.3	17.4
Incr Delay (d2), s/veh	2.2	0.4	0.2	5.2	0.0	0.0	3.1	1.1	0.1	3.0	19.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.7	1.5	9.7	0.0	0.0	2.6	0.3	0.0	1.1	37.4	1.7
LnGrp Delay(d),s/veh	46.7	38.1	36.4	49.7	0.0	0.0	55.3	1.1	0.1	61.5	57.2	17.5
LnGrp LOS	D	D	D	D			E	A	A	E	F	B
Approach Vol, veh/h		303			287			1682			2095	
Approach Delay, s/veh		40.9			49.7			3.6			55.8	
Approach LOS		D			D			A			E	

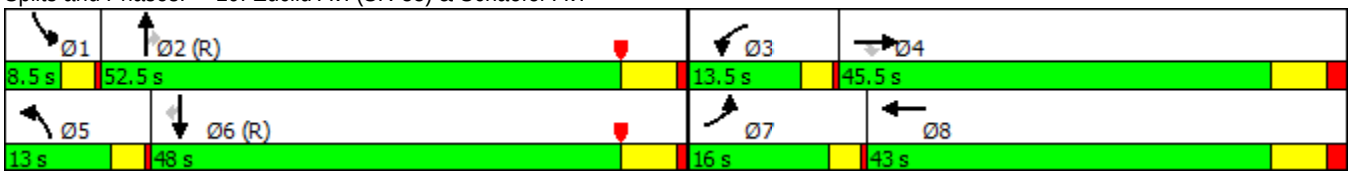
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	77.6		35.6	10.6	73.8		35.6
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	4.4	2.0		26.4	7.6	69.8		25.7
Green Ext Time (p_c), s	0.0	48.4		2.2	0.0	0.0		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	63	129	63	123	124	1495	22	15	1850	137
Future Volume (vph)	145	63	129	63	123	124	1495	22	15	1850	137
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.5	23.0	23.0	10.0	17.8	15.4	69.5	69.5	5.4	54.3	54.3
Actuated g/C Ratio	0.10	0.19	0.19	0.08	0.15	0.13	0.58	0.58	0.04	0.45	0.45
v/c Ratio	0.92	0.19	0.34	0.50	0.56	0.64	0.80	0.02	0.22	1.27	0.20
Control Delay	104.6	40.6	7.9	66.1	51.6	38.8	33.2	1.7	60.5	154.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.6	40.6	7.9	66.1	51.6	38.8	33.2	1.7	60.5	154.8	8.0
LOS	F	D	A	E	D	D	C	A	E	F	A
Approach Delay		55.6			56.1		33.2			144.0	
Approach LOS		E			E		C			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 89.2	Intersection LOS: F
Intersection Capacity Utilization 96.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	63	129	63	123	18	124	1495	22	15	1850	137
Future Volume (veh/h)	145	63	129	63	123	18	124	1495	22	15	1850	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	154	67	85	67	131	17	132	1590	18	16	1968	98
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	169	246	209	120	167	22	128	2069	926	28	1857	811
Arrive On Green	0.10	0.14	0.14	0.07	0.11	0.11	0.05	0.41	0.41	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1562	203	1619	3420	1530	1619	3420	1494
Grp Volume(v), veh/h	154	67	85	67	0	148	132	1590	18	16	1968	98
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1710	1530	1619	1710	1494
Q Serve(g_s), s	11.3	4.0	6.1	4.8	0.0	9.8	9.5	48.2	0.8	1.2	65.2	6.6
Cycle Q Clear(g_c), s	11.3	4.0	6.1	4.8	0.0	9.8	9.5	48.2	0.8	1.2	65.2	6.6
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	246	209	120	0	189	128	2069	926	28	1857	811
V/C Ratio(X)	0.91	0.27	0.41	0.56	0.00	0.78	1.03	0.77	0.02	0.57	1.06	0.12
Avail Cap(c_a), veh/h	169	578	491	135	0	529	128	2069	926	67	1857	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.11	0.11	0.11	0.11	0.11	0.11
Uniform Delay (d), s/veh	53.2	46.4	47.3	53.6	0.0	52.2	56.8	28.4	14.3	59.2	49.2	25.2
Incr Delay (d2), s/veh	44.2	0.4	0.9	1.5	0.0	5.3	33.8	0.3	0.0	0.8	28.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	2.0	2.6	2.2	0.0	5.0	5.5	22.9	0.4	0.5	38.3	2.7
LnGrp Delay(d),s/veh	97.4	46.9	48.3	55.1	0.0	57.5	91.0	28.7	14.3	60.0	77.8	25.2
LnGrp LOS	F	D	D	E		E	F	C	B	E	F	C
Approach Vol, veh/h		306			215			1740			2082	
Approach Delay, s/veh		72.7			56.8			33.3			75.2	
Approach LOS		E			E			C			E	

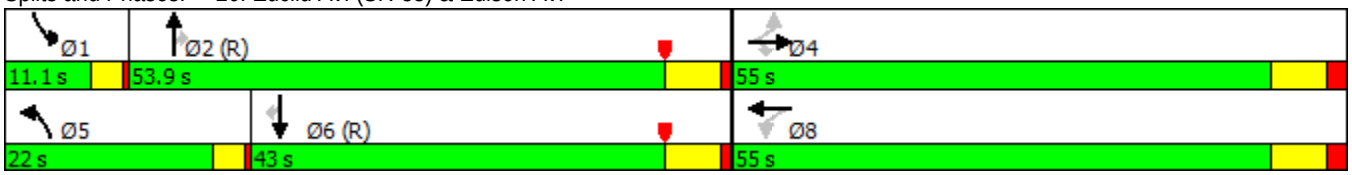
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	78.6	12.4	23.4	13.0	71.2	16.0	19.8
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	50.2	6.8	8.1	11.5	67.2	13.3	11.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	57.3
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	222	172	260	74	356	259	1342	39	42	1701	257
Future Volume (vph)	222	172	260	74	356	259	1342	39	42	1701	257
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	48.0	48.0	48.0	48.0	48.0	18.5	50.4	50.4	6.8	37.0	37.0
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.15	0.42	0.42	0.06	0.31	0.31
v/c Ratio	0.98	0.25	0.36	0.19	0.59	1.11	1.00	0.06	0.49	1.72	0.51
Control Delay	91.2	25.3	4.1	24.9	32.2	125.1	59.3	5.2	83.7	342.7	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.2	25.3	4.1	24.9	32.2	125.1	59.3	5.2	83.7	342.7	2.9
LOS	F	C	A	C	C	F	E	A	F	F	A
Approach Delay		39.2			31.0		68.4			293.6	
Approach LOS		D			C		E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.72	
Intersection Signal Delay: 155.2	Intersection LOS: F
Intersection Capacity Utilization 122.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	172	260	74	356	41	259	1342	39	42	1701	257
Future Volume (veh/h)	222	172	260	74	356	41	259	1342	39	42	1701	257
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	236	183	210	79	379	42	276	1428	26	45	1810	242
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	257	720	612	376	637	71	250	1464	655	56	1054	471
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.21	0.57	0.57	0.05	0.41	0.41
Sat Flow, veh/h	926	1800	1530	951	1592	176	1619	3420	1530	1619	3420	1528
Grp Volume(v), veh/h	236	183	210	79	0	421	276	1428	26	45	1810	242
Grp Sat Flow(s),veh/h/ln	926	1800	1530	951	0	1769	1619	1710	1530	1619	1710	1528
Q Serve(g_s), s	25.5	8.1	11.5	7.3	0.0	22.5	18.5	48.5	0.9	3.3	37.0	14.2
Cycle Q Clear(g_c), s	48.0	8.1	11.5	15.4	0.0	22.5	18.5	48.5	0.9	3.3	37.0	14.2
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	257	720	612	376	0	707	250	1464	655	56	1055	471
V/C Ratio(X)	0.92	0.25	0.34	0.21	0.00	0.60	1.11	0.98	0.04	0.81	1.72	0.51
Avail Cap(c_a), veh/h	257	720	612	376	0	707	250	1464	655	103	1055	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.72	0.72	0.72	0.09	0.09	0.09
Uniform Delay (d), s/veh	49.4	24.0	25.0	29.2	0.0	28.3	47.7	25.2	15.0	56.9	35.4	28.7
Incr Delay (d2), s/veh	35.2	0.2	0.3	0.3	0.0	1.4	80.0	14.9	0.1	1.0	322.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.3	4.1	4.9	1.9	0.0	11.3	13.8	25.8	0.4	1.5	64.7	6.0
LnGrp Delay(d),s/veh	84.5	24.2	25.4	29.5	0.0	29.7	127.6	40.2	15.1	57.8	358.2	29.0
LnGrp LOS	F	C	C	C		C	F	D	B	E	F	C
Approach Vol, veh/h		629			500			1730			2097	
Approach Delay, s/veh		47.2			29.7			53.7			313.7	
Approach LOS		D			C			D			F	

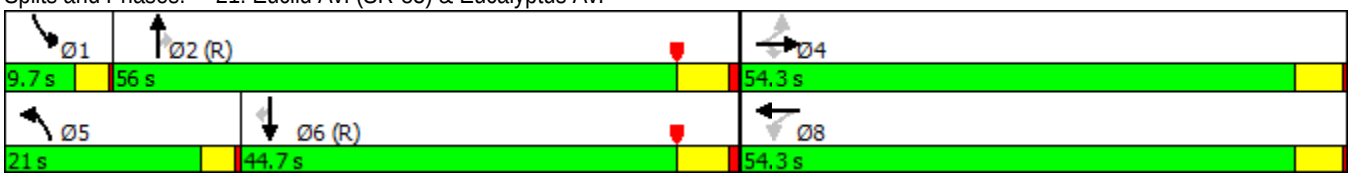
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	57.4		55.0	22.0	43.0		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	5.3	50.5		50.0	20.5	39.0		24.5
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		6.1

Intersection Summary		
HCM 2010 Ctrl Delay		160.5
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	56	8	230	25	46	184	1561	8	22	1977	28
Future Volume (vph)	56	8	230	25	46	184	1561	8	22	1977	28
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	54.3	54.3	54.3	54.3	54.3	21.0	56.0	56.0	9.7	44.7	44.7
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	17.5%	46.7%	46.7%	8.1%	37.3%	37.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	15.9	15.9	15.9	15.9	15.9	19.6	86.8	86.8	6.8	70.4	70.4
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.16	0.72	0.72	0.06	0.59	0.59
v/c Ratio	0.37	0.03	0.58	0.15	0.32	0.73	0.66	0.01	0.25	1.03	0.03
Control Delay	49.4	36.6	10.3	41.7	28.8	58.6	10.0	0.0	73.2	34.5	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	36.6	10.3	41.7	28.8	58.6	10.0	0.0	73.2	34.5	2.3
LOS	D	D	B	D	C	E	A	A	E	C	A
Approach Delay		18.4			32.0		15.1			34.4	
Approach LOS		B			C		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	8	230	25	46	32	184	1561	8	22	1977	28
Future Volume (veh/h)	56	8	230	25	46	32	184	1561	8	22	1977	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	58	8	154	26	48	26	192	1626	8	23	2059	25
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	165	220	187	199	135	73	216	2526	1130	36	2146	939
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.74	0.74	0.01	0.21	0.21
Sat Flow, veh/h	1272	1800	1530	1174	1099	596	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	58	8	154	26	0	74	192	1626	8	23	2059	25
Grp Sat Flow(s),veh/h/ln	1272	1800	1530	1174	0	1695	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	5.3	0.5	11.8	2.4	0.0	4.8	14.0	28.4	0.2	1.7	71.5	1.6
Cycle Q Clear(g_c), s	10.1	0.5	11.8	2.9	0.0	4.8	14.0	28.4	0.2	1.7	71.5	1.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	165	220	187	199	0	208	216	2526	1130	36	2146	939
V/C Ratio(X)	0.35	0.04	0.82	0.13	0.00	0.36	0.89	0.64	0.01	0.64	0.96	0.03
Avail Cap(c_a), veh/h	534	743	631	540	0	699	236	2526	1130	84	2146	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	52.9	46.4	51.4	47.7	0.0	48.3	51.1	7.8	4.1	59.1	46.1	18.4
Incr Delay (d2), s/veh	0.9	0.0	6.6	0.2	0.0	0.8	28.9	1.3	0.0	1.3	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	5.3	0.8	0.0	2.3	8.0	13.5	0.1	0.8	34.5	0.7
LnGrp Delay(d),s/veh	53.9	46.5	58.0	47.9	0.0	49.1	80.0	9.1	4.1	60.3	47.7	18.4
LnGrp LOS	D	D	E	D		D	E	A	A	E	D	B
Approach Vol, veh/h		220			100			1826			2107	
Approach Delay, s/veh		56.5			48.8			16.5			47.5	
Approach LOS		E			D			B			D	

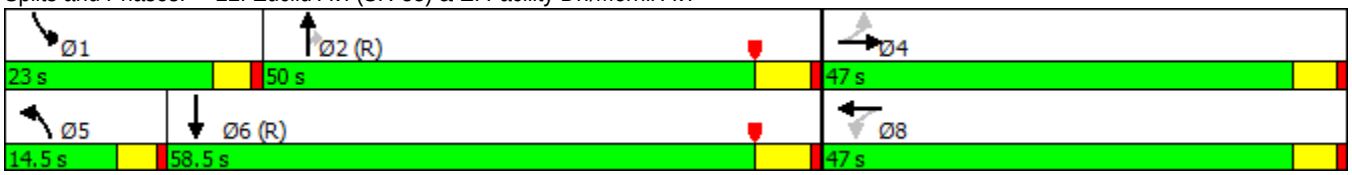
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	94.3		19.5	19.5	81.0		19.5
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	50.3		49.5	17.5	39.0		49.5
Max Q Clear Time (g_c+I1), s	3.7	30.4		13.8	16.0	73.5		6.8
Green Ext Time (p_c), s	0.0	18.9		0.9	0.1	0.0		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	394	49	20	1122	186	484	1750
Future Volume (vph)	8	6	394	49	20	1122	186	484	1750
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		42.0		42.0	10.0	44.0	44.0	18.5	61.2
Actuated g/C Ratio		0.35		0.35	0.08	0.37	0.37	0.15	0.51
v/c Ratio		0.04		2.04	0.16	0.93	0.31	2.03	1.08
Control Delay		22.0		498.7	59.9	32.2	10.0	497.1	63.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.0		498.7	59.9	32.2	10.0	497.1	63.3
LOS		C		F	E	C	B	F	E
Approach Delay		22.0		498.7		29.5			155.4
Approach LOS		C		F		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.04	
Intersection Signal Delay: 197.2	Intersection LOS: F
Intersection Capacity Utilization 148.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	394	49	622	20	1122	186	484	1750	45
Future Volume (veh/h)	8	6	4	394	49	622	20	1122	186	484	1750	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	8	6	3	410	51	602	21	1169	168	504	1823	44
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	205	148	66	243	25	296	68	1254	561	250	1635	39
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.04	0.37	0.37	0.15	0.48	0.48
Sat Flow, veh/h	460	422	189	576	72	846	1619	3420	1530	1619	3413	82
Grp Volume(v), veh/h	17	0	0	1063	0	0	21	1169	168	504	910	957
Grp Sat Flow(s),veh/h/ln	1070	0	0	1493	0	0	1619	1710	1530	1619	1710	1786
Q Serve(g_s), s	0.0	0.0	0.0	41.2	0.0	0.0	1.5	39.5	9.4	18.5	57.5	57.5
Cycle Q Clear(g_c), s	0.8	0.0	0.0	42.0	0.0	0.0	1.5	39.5	9.4	18.5	57.5	57.5
Prop In Lane	0.47		0.18	0.39		0.57	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	419	0	0	564	0	0	68	1254	561	250	819	855
V/C Ratio(X)	0.04	0.00	0.00	1.88	0.00	0.00	0.31	0.93	0.30	2.02	1.11	1.12
Avail Cap(c_a), veh/h	419	0	0	564	0	0	135	1254	561	250	819	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	0.0	40.5	0.0	0.0	55.8	36.6	27.0	50.8	31.3	31.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	404.4	0.0	0.0	0.1	1.7	0.1	472.5	66.6	68.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	82.0	0.0	0.0	0.7	18.8	4.0	41.0	42.2	44.6
LnGrp Delay(d),s/veh	25.6	0.0	0.0	444.9	0.0	0.0	55.9	38.2	27.2	523.3	97.9	100.2
LnGrp LOS	C			F			E	D	C	F	F	F
Approach Vol, veh/h		17			1063			1358			2371	
Approach Delay, s/veh		25.6			444.9			37.1			189.3	
Approach LOS		C			F			D			F	

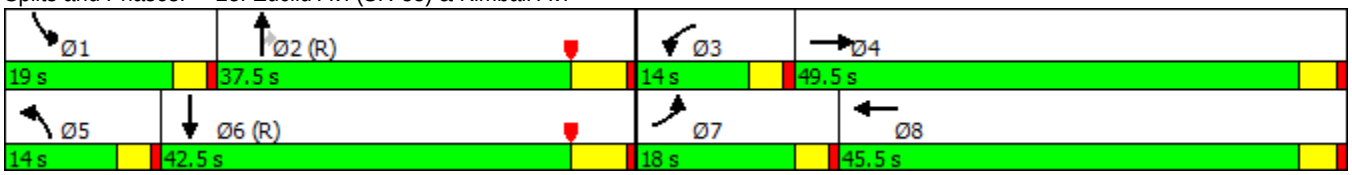
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	50.0		47.0	9.5	63.5		47.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	20.5	41.5		2.8	3.5	59.5		44.0
Green Ext Time (p_c), s	0.0	2.4		6.5	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		202.2
HCM 2010 LOS		F

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	282	511	137	631	176	800	228	636	751
Future Volume (vph)	282	511	137	631	176	800	228	636	751
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	14.0	38.4	10.0	34.4	16.6	31.5	31.5	21.6	36.5
Actuated g/C Ratio	0.12	0.32	0.08	0.29	0.14	0.26	0.26	0.18	0.30
v/c Ratio	1.53	0.52	1.04	0.86	0.81	0.91	0.41	2.25	1.30
Control Delay	300.5	34.0	143.4	48.1	45.4	38.8	10.1	587.0	157.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	300.5	34.0	143.4	48.1	45.4	38.8	10.1	587.0	157.7
LOS	F	C	F	D	D	D	B	F	F
Approach Delay		123.6		61.8		34.3			292.7
Approach LOS		F		E		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.25	
Intersection Signal Delay: 158.5	Intersection LOS: F
Intersection Capacity Utilization 120.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	282	511	46	137	631	188	176	800	228	636	751	635
Future Volume (veh/h)	282	511	46	137	631	188	176	800	228	636	751	635
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	288	521	45	140	644	170	180	816	225	649	766	610
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	189	1010	87	135	760	200	135	1096	490	202	660	513
Arrive On Green	0.12	0.32	0.32	0.08	0.28	0.28	0.03	0.11	0.11	0.13	0.36	0.36
Sat Flow, veh/h	1619	3187	275	1619	2679	706	1619	3420	1530	1619	1823	1416
Grp Volume(v), veh/h	288	279	287	140	411	403	180	816	225	649	718	658
Grp Sat Flow(s),veh/h/ln	1619	1710	1752	1619	1710	1675	1619	1710	1530	1619	1710	1529
Q Serve(g_s), s	14.0	16.0	16.1	10.0	27.2	27.2	10.0	27.8	16.6	15.0	43.5	43.5
Cycle Q Clear(g_c), s	14.0	16.0	16.1	10.0	27.2	27.2	10.0	27.8	16.6	15.0	43.5	43.5
Prop In Lane	1.00		0.16	1.00		0.42	1.00		1.00	1.00		0.93
Lane Grp Cap(c), veh/h	189	542	555	135	485	475	135	1096	490	202	619	554
V/C Ratio(X)	1.52	0.51	0.52	1.04	0.85	0.85	1.33	0.74	0.46	3.21	1.16	1.19
Avail Cap(c_a), veh/h	189	641	657	135	584	572	135	1096	490	202	619	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.0	33.4	33.5	55.0	40.5	40.6	58.4	48.9	43.9	52.5	38.3	38.3
Incr Delay (d2), s/veh	257.3	0.6	0.6	87.9	8.3	8.6	155.0	0.4	0.3	994.2	73.2	86.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.7	7.6	7.8	7.8	13.9	13.7	10.3	13.3	7.1	62.6	33.1	31.7
LnGrp Delay(d),s/veh	310.3	34.1	34.1	143.3	48.8	49.2	213.4	49.3	44.2	1046.7	111.4	125.2
LnGrp LOS	F	C	C	F	D	D	F	D	D	F	F	F
Approach Vol, veh/h		854			954			1221			2025	
Approach Delay, s/veh		127.2			62.8			72.5			415.7	
Approach LOS		F			E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	44.5	14.0	42.5	14.0	49.5	18.0	38.5
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	29.8	12.0	18.1	12.0	45.5	16.0	29.2
Green Ext Time (p_c), s	0.0	1.6	0.0	6.5	0.0	0.0	0.0	4.8

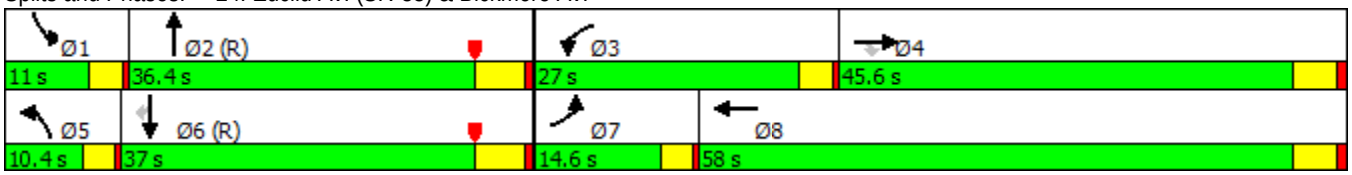
Intersection Summary	
HCM 2010 Ctrl Delay	217.4
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	87	28	52	309	419	80	823	85	703	113
Future Volume (vph)	87	28	52	309	419	80	823	85	703	113
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	14.6	45.6	45.6	27.0	58.0	10.4	36.4	11.0	37.0	37.0
Total Split (%)	12.2%	38.0%	38.0%	22.5%	48.3%	8.7%	30.3%	9.2%	30.8%	30.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.8	33.2	33.2	30.4	51.8	7.6	32.9	8.0	33.3	33.3
Actuated g/C Ratio	0.08	0.28	0.28	0.25	0.43	0.06	0.27	0.07	0.28	0.28
v/c Ratio	0.70	0.06	0.11	0.80	0.97	0.84	1.15	0.84	0.79	0.23
Control Delay	80.7	27.3	0.4	61.2	57.9	36.4	101.0	62.8	23.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.7	27.3	0.4	61.2	57.9	36.4	101.0	62.8	23.1	4.9
LOS	F	C	A	E	E	D	F	E	C	A
Approach Delay		46.9			58.9		96.2		24.5	
Approach LOS		D			E		F		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 61.3 — Intersection LOS: E
Intersection Capacity Utilization 96.4% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	28	52	309	419	263	80	823	181	85	703	113
Future Volume (veh/h)	87	28	52	309	419	263	80	823	181	85	703	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	93	30	53	329	446	267	85	876	192	90	748	111
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	114	556	472	317	459	275	93	801	175	101	998	447
Arrive On Green	0.07	0.31	0.31	0.20	0.43	0.43	0.04	0.19	0.19	0.04	0.20	0.20
Sat Flow, veh/h	1619	1800	1529	1619	1056	632	1619	2791	611	1619	3420	1530
Grp Volume(v), veh/h	93	30	53	329	0	713	85	537	531	90	748	111
Grp Sat Flow(s),veh/h/ln	1619	1800	1529	1619	0	1688	1619	1710	1692	1619	1710	1530
Q Serve(g_s), s	6.8	1.4	3.0	23.5	0.0	49.6	6.3	34.4	34.4	6.6	24.7	7.4
Cycle Q Clear(g_c), s	6.8	1.4	3.0	23.5	0.0	49.6	6.3	34.4	34.4	6.6	24.7	7.4
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	114	556	472	317	0	734	93	491	485	101	998	447
V/C Ratio(X)	0.82	0.05	0.11	1.04	0.00	0.97	0.91	1.09	1.09	0.89	0.75	0.25
Avail Cap(c_a), veh/h	150	609	517	317	0	746	93	491	485	101	998	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.0	29.1	29.7	48.3	0.0	33.2	57.4	48.5	48.5	57.1	44.1	37.1
Incr Delay (d2), s/veh	17.8	0.0	0.0	60.6	0.0	25.7	11.8	45.8	46.1	8.7	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.7	1.3	15.8	0.0	28.2	3.1	22.5	22.3	3.2	11.8	3.1
LnGrp Delay(d),s/veh	72.8	29.2	29.7	108.9	0.0	58.9	69.2	94.3	94.6	65.8	44.6	37.3
LnGrp LOS	E	C	C	F		E	E	F	F	E	D	D
Approach Vol, veh/h		176			1042			1153			949	
Approach Delay, s/veh		52.4			74.7			92.6			45.8	
Approach LOS		D			E			F			D	

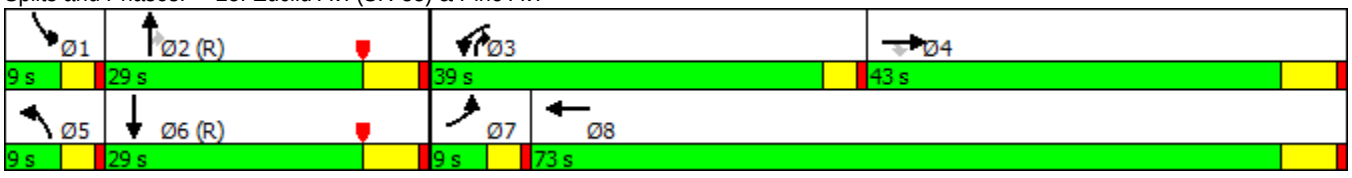
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	39.9	27.0	42.1	10.4	40.5	11.9	57.2
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	7.5	30.9	23.5	40.6	6.9	31.5	11.1	53.0
Max Q Clear Time (g_c+I1), s	8.6	36.4	25.5	5.0	8.3	26.7	8.8	51.6
Green Ext Time (p_c), s	0.0	0.0	0.0	3.5	0.0	3.0	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	71.4
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	227	34	915	173	60	1027	516	92	950
Future Volume (vph)	5	227	34	915	173	60	1027	516	92	950
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	23.2	23.2	35.0	60.4	8.7	27.8	64.8	13.9	33.0
Actuated g/C Ratio	0.04	0.19	0.19	0.29	0.50	0.07	0.23	0.54	0.12	0.28
v/c Ratio	0.07	0.66	0.08	1.07	0.36	0.52	1.31	0.53	0.50	1.04
Control Delay	57.8	52.6	0.4	93.5	15.3	57.7	183.0	4.5	62.4	64.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	52.6	0.4	93.5	15.3	57.7	183.0	4.5	62.4	64.5
LOS	E	D	A	F	B	E	F	A	E	E
Approach Delay		46.1			73.8		120.8			64.4
Approach LOS		D			E		F			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 87.8	Intersection LOS: F
Intersection Capacity Utilization 95.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	227	34	915	173	135	60	1027	516	92	950	15
Future Volume (veh/h)	5	227	34	915	173	135	60	1027	516	92	950	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	229	0	924	175	121	61	1037	343	93	960	10
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	308	262	862	450	311	67	1125	938	67	1141	12
Arrive On Green	0.01	0.17	0.00	0.29	0.46	0.46	0.04	0.33	0.33	0.01	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	987	682	1619	3420	1496	1619	3467	36
Grp Volume(v), veh/h	5	229	0	924	0	296	61	1037	343	93	474	496
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1669	1619	1710	1496	1619	1710	1793
Q Serve(g_s), s	0.4	14.5	0.0	35.0	0.0	14.1	4.5	35.0	13.5	5.0	32.6	32.6
Cycle Q Clear(g_c), s	0.4	14.5	0.0	35.0	0.0	14.1	4.5	35.0	13.5	5.0	32.6	32.6
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	10	308	262	862	0	762	67	1125	938	67	563	590
V/C Ratio(X)	0.48	0.74	0.00	1.07	0.00	0.39	0.90	0.92	0.37	1.38	0.84	0.84
Avail Cap(c_a), veh/h	67	555	472	862	0	932	67	1125	938	67	563	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.56	0.56	0.56
Uniform Delay (d), s/veh	59.4	47.3	0.0	42.5	0.0	21.6	57.3	38.8	11.2	59.2	50.4	50.4
Incr Delay (d2), s/veh	12.4	5.0	0.0	51.7	0.0	0.5	14.1	1.6	0.1	214.0	8.6	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.6	0.0	20.4	0.0	6.6	2.3	16.8	5.6	6.3	16.8	17.6
LnGrp Delay(d),s/veh	71.8	52.3	0.0	94.2	0.0	22.0	71.3	40.4	11.3	273.2	59.0	58.6
LnGrp LOS	E	D		F		C	E	D	B	F	E	E
Approach Vol, veh/h		234			1220			1441			1063	
Approach Delay, s/veh		52.7			76.7			34.8			77.5	
Approach LOS		D			E			C			E	

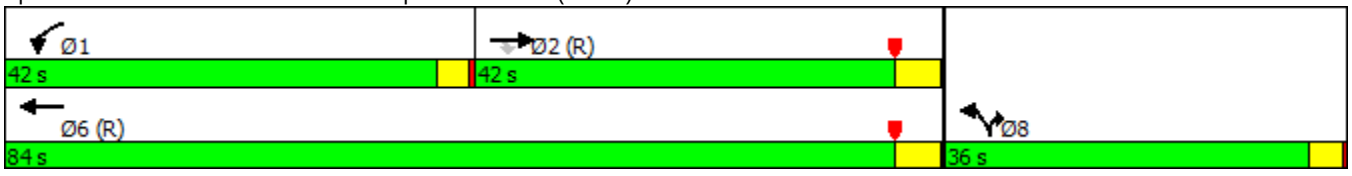
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	45.5	39.0	26.5	9.0	45.5	4.8	60.7
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	7.0	37.0	37.0	16.5	6.5	34.6	2.4	16.1
Green Ext Time (p_c), s	0.0	0.0	0.0	4.0	0.0	0.0	0.0	4.8

Intersection Summary	
HCM 2010 Ctrl Delay	60.2
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	569	312	614	1277	75	1070
Future Volume (vph)	569	312	614	1277	75	1070
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	42.0	42.0	42.0	84.0	36.0	36.0
Total Split (%)	35.0%	35.0%	35.0%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	37.5	37.5	38.5	79.5	32.5	32.5
Actuated g/C Ratio	0.31	0.31	0.32	0.66	0.27	0.27
v/c Ratio	0.56	0.46	1.17	0.59	0.09	1.31
Control Delay	59.2	24.6	112.9	0.8	33.1	168.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	24.6	112.9	0.8	33.1	168.5
LOS	E	C	F	A	C	F
Approach Delay	46.9			37.2	159.6	
Approach LOS	D			D	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 75.2	Intersection LOS: E
Intersection Capacity Utilization 93.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	569	312	614	1277	75	1070
Future Volume (veh/h)	569	312	614	1277	75	1070
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	593	0	640	1330	78	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1852	829	550	3050	139	64
Arrive On Green	1.00	0.00	0.32	0.89	0.04	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	593	0	640	1330	78	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	0.0	0.0	38.5	8.3	2.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	38.5	8.3	2.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1853	829	550	3050	139	64
V/C Ratio(X)	0.32	0.00	1.16	0.44	0.56	0.00
Avail Cap(c_a), veh/h	1853	829	550	3050	901	414
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	40.7	1.2	56.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	75.7	0.0	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	29.7	3.7	1.3	0.0
LnGrp Delay(d),s/veh	0.5	0.0	116.4	1.2	60.0	0.0
LnGrp LOS	A		F	A	E	
Approach Vol, veh/h	593			1970	78	
Approach Delay, s/veh	0.5			38.6	60.0	
Approach LOS	A			D	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	42.0	69.5				111.5		8.5
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	38.5	37.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	40.5	2.0				10.3		4.8
Green Ext Time (p_c), s	0.0	14.4				16.8		0.2

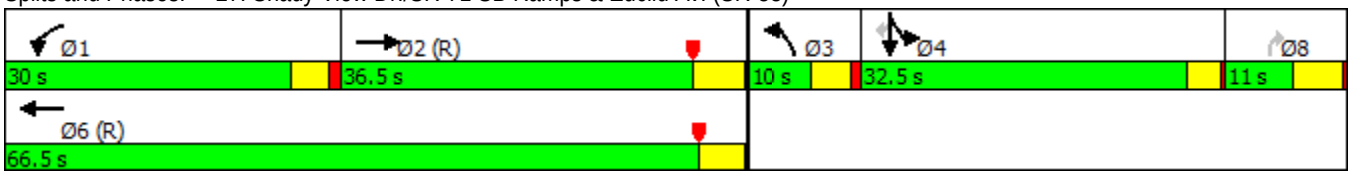
Intersection Summary	
HCM 2010 Ctrl Delay	30.7
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	845	412	253	64	312	282	22	37
Future Volume (vph)	845	412	253	64	312	282	22	37
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	36.5	30.0	66.5	10.0	11.0	32.5	32.5	32.5
Total Split (%)	30.4%	25.0%	55.4%	8.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	31.5	34.0	70.5	5.5	7.4	19.1	19.1	19.1
Actuated g/C Ratio	0.26	0.28	0.59	0.05	0.06	0.16	0.16	0.16
v/c Ratio	1.06	0.99	0.14	0.95	0.82	0.68	0.64	0.11
Control Delay	89.3	81.1	3.6	147.9	22.8	61.0	57.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	81.1	3.6	147.9	22.8	61.0	57.5	0.6
LOS	F	F	A	F	C	E	E	A
Approach Delay	89.3		51.6				52.8	
Approach LOS	F		D				D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 65.0 — Intersection LOS: E
Intersection Capacity Utilization 77.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	845	17	412	253	0	64	0	312	282	22	37
Future Volume (veh/h)	0	845	17	412	253	0	64	0	312	282	22	37
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	929	19	453	278	0	70	0	343	327	0	41
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1903	39	344	2754	0	0	0	0	402	0	190
Arrive On Green	0.00	0.56	0.56	0.35	1.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Sat Flow, veh/h	0	3518	70	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	463	485	453	278	0		0.0		327	0	41
Grp Sat Flow(s),veh/h/ln	0	1710	1788	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	19.8	19.8	25.5	0.0	0.0				11.8	0.0	2.9
Cycle Q Clear(g_c), s	0.0	19.8	19.8	25.5	0.0	0.0				11.8	0.0	2.9
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	949	992	344	2754	0				402	0	190
V/C Ratio(X)	0.00	0.49	0.49	1.32	0.10	0.00				0.81	0.00	0.22
Avail Cap(c_a), veh/h	0	949	992	344	2754	0				783	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.3	16.3	38.7	0.0	0.0				51.2	0.0	47.3
Incr Delay (d2), s/veh	0.0	1.8	1.7	161.7	0.1	0.0				4.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.7	10.2	26.8	0.0	0.0				5.5	0.0	1.3
LnGrp Delay(d),s/veh	0.0	18.1	18.0	200.4	0.1	0.0				55.3	0.0	47.9
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		948			731						368	
Approach Delay, s/veh		18.0			124.2						54.4	
Approach LOS		B			F						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	30.0	71.6		18.4		101.6		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	25.5	31.5		29.0		* 62		
Max Q Clear Time (g_c+I1), s	27.5	21.8		13.8		2.0		
Green Ext Time (p_c), s	0.0	3.6		1.1		5.3		

Intersection Summary	
HCM 2010 Ctrl Delay	62.5
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	297	847	6	0	5
Future Vol, veh/h	0	297	847	6	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	323	921	7	0	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	924
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	329
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	329
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	329
HCM Lane V/C Ratio	-	-	-	0.017
HCM Control Delay (s)	-	-	-	16.1
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	297	849	5	0	4
Future Vol, veh/h	0	297	849	5	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	323	923	5	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	926
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	329
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	329
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	329
HCM Lane V/C Ratio	-	-	-	0.013
HCM Control Delay (s)	-	-	-	16.1
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1169	215	16	1038	41	3
Future Volume (vph)	1169	215	16	1038	41	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.2	24.2	9.6	24.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	72.8	72.8	5.0	76.3	12.9	12.9
Actuated g/C Ratio	0.72	0.72	0.05	0.76	0.13	0.13
v/c Ratio	0.98	0.20	0.21	0.83	0.22	0.02
Control Delay	36.2	2.5	56.6	16.1	42.2	25.0
Queue Delay	0.0	0.0	0.0	0.8	0.0	0.0
Total Delay	36.2	2.5	56.6	16.9	42.2	25.0
LOS	D	A	E	B	D	C
Approach Delay	30.9			17.5	41.1	
Approach LOS	C			B	D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 100.6			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 25.4		Intersection LOS: C	
Intersection Capacity Utilization 82.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1169	215	16	1038	41	3
Future Volume (veh/h)	1169	215	16	1038	41	3
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1271	234	17	1128	45	3
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1299	1104	30	1416	162	153
Arrive On Green	0.72	0.72	0.02	0.79	0.10	0.10
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1271	234	17	1128	45	3
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	66.7	5.0	1.0	35.8	2.6	0.2
Cycle Q Clear(g_c), s	66.7	5.0	1.0	35.8	2.6	0.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1299	1104	30	1416	162	153
V/C Ratio(X)	0.98	0.21	0.56	0.80	0.28	0.02
Avail Cap(c_a), veh/h	1301	1106	81	1475	438	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	4.6	48.5	6.1	41.5	40.4
Incr Delay (d2), s/veh	19.9	0.1	5.8	3.0	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	39.7	2.1	0.5	18.4	1.2	0.1
LnGrp Delay(d),s/veh	33.1	4.7	54.3	9.1	42.4	40.5
LnGrp LOS	C	A	D	A	D	D
Approach Vol, veh/h	1505			1145	48	
Approach Delay, s/veh	28.7			9.8	42.3	
Approach LOS	C			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.5	78.2				84.6		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	3.0	68.7				37.8		4.6
Green Ext Time (p_c), s	0.0	3.2				33.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	20.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	44	220	11
Future Vol, veh/h	0	4	0	44	220	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	4	0	48	239	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	245	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	799	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	799	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	799	-	-
HCM Lane V/C Ratio	-	0.005	-	-
HCM Control Delay (s)	-	9.5	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	12	33	5	61	164
Future Vol, veh/h	1	12	33	5	61	164
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	13	36	5	66	178

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	350	39	0	0	41	0
Stage 1	39	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	651	1038	-	-	1581	-
Stage 1	989	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	621	1038	-	-	1581	-
Mov Cap-2 Maneuver	635	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	714	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	990	1581	-
HCM Lane V/C Ratio	-	-	0.014	0.042	-
HCM Control Delay (s)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	4	35	5	18	146
Future Vol, veh/h	1	4	35	5	18	146
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	4	38	5	20	159

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	239	41	0	0	43	0
Stage 1	41	-	-	-	-	-
Stage 2	198	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	754	1036	-	-	1579	-
Stage 1	987	-	-	-	-	-
Stage 2	840	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	743	1036	-	-	1579	-
Mov Cap-2 Maneuver	736	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	828	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	958	1579	-
HCM Lane V/C Ratio	-	-	0.006	0.012	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	2	11	39	142	5
Future Vol, veh/h	1	2	11	39	142	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	2	12	42	154	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	223	157	160	0	-	0
Stage 1	157	-	-	-	-	-
Stage 2	66	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	770	894	1432	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	763	894	1432	-	-	-
Mov Cap-2 Maneuver	761	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	953	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1432	-	845	-	-
HCM Lane V/C Ratio	0.008	-	0.004	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	49	6	5	139
Future Vol, veh/h	1	1	49	6	5	139
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	1	53	7	5	151

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	219	57	0	0	60	0
Stage 1	57	-	-	-	-	-
Stage 2	162	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	774	1015	-	-	1556	-
Stage 1	971	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	771	1015	-	-	1556	-
Mov Cap-2 Maneuver	764	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	869	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	872	1556	-
HCM Lane V/C Ratio	-	-	0.002	0.003	-
HCM Control Delay (s)	-	-	9.1	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	2	32	48	108	31
Future Vol, veh/h	6	2	32	48	108	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	2	35	52	117	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	256	134	151	0	-	0
Stage 1	134	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	737	920	1442	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	719	920	1442	-	-	-
Mov Cap-2 Maneuver	735	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	885	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1442	-	774	-	-
HCM Lane V/C Ratio	0.024	-	0.011	-	-
HCM Control Delay (s)	7.6	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	2	11	73	84	26
Future Vol, veh/h	7	2	11	73	84	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	2	12	79	91	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	208	105	120	0	-	0
Stage 1	105	-	-	-	-	-
Stage 2	103	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	785	955	1480	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	779	955	1480	-	-	-
Mov Cap-2 Maneuver	776	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1480	-	810	-	-
HCM Lane V/C Ratio	0.008	-	0.012	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	2	11	78	54	33
Future Vol, veh/h	6	2	11	78	54	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	2	12	85	59	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	186	77	95	0	-	0
Stage 1	77	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	808	990	1512	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	802	990	1512	-	-	-
Mov Cap-2 Maneuver	790	-	-	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1512	-	832	-	-
HCM Lane V/C Ratio	0.008	-	0.01	-	-
HCM Control Delay (s)	7.4	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	8	87	45	11
Future Vol, veh/h	2	2	8	87	45	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	2	9	95	49	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	167	55	61	0	-	0
Stage 1	55	-	-	-	-	-
Stage 2	112	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	828	1018	1555	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	918	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	823	1018	1555	-	-	-
Mov Cap-2 Maneuver	802	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1555	-	897	-	-
HCM Lane V/C Ratio	0.006	-	0.005	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	7	54	91	28	18
Future Vol, veh/h	4	7	54	91	28	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	8	59	99	30	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	256	40	50	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	737	1037	1570	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	708	1037	1570	-	-	-
Mov Cap-2 Maneuver	705	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	792	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1570	-	885	-	-
HCM Lane V/C Ratio	0.037	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	33	142	24	11
Future Vol, veh/h	2	2	33	142	24	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	2	36	154	26	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	258	32	38	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	735	1048	1585	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	816	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	717	1048	1585	-	-	-
Mov Cap-2 Maneuver	711	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	796	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1585	-	847	-	-
HCM Lane V/C Ratio	0.023	-	0.005	-	-
HCM Control Delay (s)	7.3	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	154	143	834	22	6	20
Future Vol, veh/h	154	143	834	22	6	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	167	155	907	24	7	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	907	0	-	0	1397	907
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	490	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	759	-	-	-	157	337
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	620	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	759	-	-	-	122	337
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	484	-

Approach	EB	WB	SB
HCM Control Delay, s	5.7	0	16.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	759	-	-	-	312	337
HCM Lane V/C Ratio	0.221	-	-	-	0.021	0.065
HCM Control Delay (s)	11.1	-	-	-	16.8	16.4
HCM Lane LOS	B	-	-	-	C	C
HCM 95th %tile Q(veh)	0.8	-	-	-	0.1	0.2

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1145	27	0	1055	0	5
Future Vol, veh/h	1145	27	0	1055	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1245	29	0	1147	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	622
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	434
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	434
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

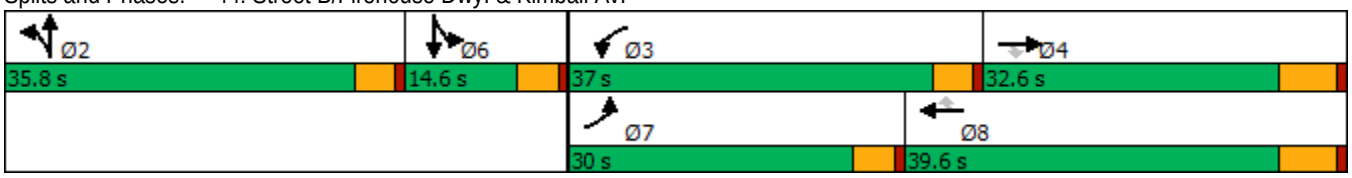
Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	434	-	-	-
HCM Lane V/C Ratio	0.013	-	-	-
HCM Control Delay (s)	13.4	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	3	995	266	79	1412	0	0
Future Volume (vph)	3	995	266	79	1412	0	0
Turn Type	Prot	NA	Perm	Prot	NA	NA	NA
Protected Phases	7	4		3	8	2	6
Permitted Phases			4				
Detector Phase	7	4	4	3	8	2	6
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	23.2	9.6	16.2	31.6	14.6
Total Split (s)	30.0	32.6	32.6	37.0	39.6	35.8	14.6
Total Split (%)	25.0%	27.2%	27.2%	30.8%	33.0%	29.8%	12.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	Max	None	None
Act Effct Green (s)	5.3	34.3	34.3	7.9	43.3	12.8	10.4
Actuated g/C Ratio	0.08	0.52	0.52	0.12	0.66	0.19	0.16
v/c Ratio	0.02	0.58	0.29	0.43	1.31	0.15	0.00
Control Delay	36.0	19.8	10.0	36.4	164.3	0.7	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	19.8	10.0	36.4	164.3	0.7	32.0
LOS	D	B	B	D	F	A	C
Approach Delay		17.8			157.5	0.7	32.0
Approach LOS		B			F	A	C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 65.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 91.3	Intersection LOS: F
Intersection Capacity Utilization 95.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	995	266	79	1412	0	59	0	6	1	0	0
Future Volume (veh/h)	3	995	266	79	1412	0	59	0	6	1	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	3	1093	182	87	1552	0	65	0	7	1	0	0
Adj No. of Lanes	1	2	1	1	1	1	0	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	1748	743	109	988	840	177	0	19	5	0	0
Arrive On Green	0.00	0.49	0.49	0.07	0.55	0.00	0.12	0.00	0.12	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	1800	1530	1530	0	165	1714	0	0
Grp Volume(v), veh/h	3	1093	182	87	1552	0	72	0	0	1	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1694	0	0	1714	0	0
Q Serve(g_s), s	0.1	13.6	4.2	3.2	33.4	0.0	2.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	13.6	4.2	3.2	33.4	0.0	2.4	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.90		0.10	1.00		0.00
Lane Grp Cap(c), veh/h	7	1748	743	109	988	840	196	0	0	5	0	0
V/C Ratio(X)	0.46	0.63	0.24	0.80	1.57	0.00	0.37	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	676	1748	743	862	988	840	869	0	0	282	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	30.2	11.6	9.1	28.0	13.7	0.0	24.9	0.0	0.0	30.3	0.0	0.0
Incr Delay (d2), s/veh	17.2	1.7	0.8	5.0	261.8	0.0	1.1	0.0	0.0	20.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	7.1	1.9	1.6	88.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	47.4	13.3	9.9	33.0	275.6	0.0	26.0	0.0	0.0	51.2	0.0	0.0
LnGrp LOS	D	B	A	C	F		C			D		
Approach Vol, veh/h		1278			1639			72			1	
Approach Delay, s/veh		12.9			262.7			26.0			51.2	
Approach LOS		B			F			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.6	8.7	35.8		4.8	4.8	39.6
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		31.2	32.4	26.4		10.0	25.4	33.4
Max Q Clear Time (g_c+I1), s		4.4	5.2	15.6		2.0	2.1	35.4
Green Ext Time (p_c), s		0.4	0.1	5.4		0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	150.1
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	0	0	0	0	7	0	48	0	44	251	49
Future Vol, veh/h	9	0	0	0	0	7	0	48	0	44	251	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	0	0	0	0	8	0	52	0	48	273	53

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	451	447	299	447	474	52	326	0	0	52	0	0
Stage 1	395	395	-	52	52	-	-	-	-	-	-	-
Stage 2	56	52	-	395	422	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	522	509	745	525	492	1021	1245	-	-	1567	-	-
Stage 1	634	608	-	966	856	-	-	-	-	-	-	-
Stage 2	961	856	-	634	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	503	490	745	510	473	1021	1245	-	-	1567	-	-
Mov Cap-2 Maneuver	503	490	-	510	473	-	-	-	-	-	-	-
Stage 1	634	585	-	966	856	-	-	-	-	-	-	-
Stage 2	954	856	-	610	570	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	8.6	0	0.9
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1245	-	-	503	1021	1567	-	-
HCM Lane V/C Ratio	-	-	-	0.019	0.007	0.031	-	-
HCM Control Delay (s)	0	-	-	12.3	8.6	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	47	246	5
Future Vol, veh/h	1	0	0	47	246	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	0	0	51	267	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	321	270	273	0	-	0
Stage 1	270	-	-	-	-	-
Stage 2	51	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	636	774	1302	-	-	-
Stage 1	740	-	-	-	-	-
Stage 2	967	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	636	774	1302	-	-	-
Mov Cap-2 Maneuver	636	-	-	-	-	-
Stage 1	740	-	-	-	-	-
Stage 2	967	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1302	-	636	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	10.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	17	0	155	91
Future Vol, veh/h	0	30	17	0	155	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	33	18	0	168	99

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	454	18	0	0	18	0
Stage 1	18	-	-	-	-	-
Stage 2	436	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	568	1066	-	-	1612	-
Stage 1	1010	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	506	1066	-	-	1612	-
Mov Cap-2 Maneuver	506	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	584	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	4.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1066	1612	-
HCM Lane V/C Ratio	-	-	0.031	0.105	-
HCM Control Delay (s)	-	-	8.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.3	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	872	16	0	1074	0	4
Future Vol, veh/h	872	16	0	1074	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	948	17	0	1167	0	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	474
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	542
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	542
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	542	-	-	-
HCM Lane V/C Ratio	0.008	-	-	-
HCM Control Delay (s)	11.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	851	36	21	1045	64	48
Future Vol, veh/h	851	36	21	1045	64	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	886	38	22	1089	67	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	924	0	2037	462
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	1132	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	748	-	~ 56	552
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	311	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	748	-	~ 54	552
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	302	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	21.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	224	552	-	-	748	-
HCM Lane V/C Ratio	0.298	0.091	-	-	0.029	-
HCM Control Delay (s)	27.7	12.2	-	-	10	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.2	0.3	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	832	33	893	172	39
Future Volume (vph)	832	33	893	172	39
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	30.0	5.1	33.6	10.2	10.2
Actuated g/C Ratio	0.54	0.09	0.61	0.18	0.18
v/c Ratio	0.54	0.24	0.90	0.64	0.14
Control Delay	10.0	30.0	22.0	35.5	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	30.0	22.0	35.5	9.4
LOS	A	C	C	D	A
Approach Delay	10.0		22.3	30.6	
Approach LOS	A		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 55.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 69.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	832	67	33	893	172	39
Future Volume (veh/h)	832	67	33	893	172	39
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	914	74	36	981	189	40
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1624	131	62	1128	284	268
Arrive On Green	0.51	0.51	0.04	0.63	0.18	0.18
Sat Flow, veh/h	3289	259	1619	1800	1619	1530
Grp Volume(v), veh/h	489	499	36	981	189	40
Grp Sat Flow(s),veh/h/ln	1710	1748	1619	1800	1619	1530
Q Serve(g_s), s	11.2	11.2	1.2	25.5	6.2	1.3
Cycle Q Clear(g_c), s	11.2	11.2	1.2	25.5	6.2	1.3
Prop In Lane		0.15	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	868	887	62	1128	284	268
V/C Ratio(X)	0.56	0.56	0.58	0.87	0.67	0.15
Avail Cap(c_a), veh/h	873	892	142	1222	284	268
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.7	9.7	27.0	8.7	22.0	19.9
Incr Delay (d2), s/veh	0.8	0.8	3.2	6.6	11.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	5.5	0.6	14.3	3.7	0.6
LnGrp Delay(d),s/veh	10.5	10.5	30.2	15.4	33.7	21.1
LnGrp LOS	B	B	C	B	C	C
Approach Vol, veh/h	988			1017	229	
Approach Delay, s/veh	10.5			15.9	31.5	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.8	35.2				41.9		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	3.2	13.2				27.5		8.2
Green Ext Time (p_c), s	0.0	10.7				8.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	755	72	684	243	83
Future Volume (vph)	755	72	684	243	83
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	22.3	5.4	29.8	13.7	13.7
Actuated g/C Ratio	0.41	0.10	0.55	0.25	0.25
v/c Ratio	0.74	0.51	0.78	0.67	0.23
Control Delay	18.0	39.3	16.0	31.9	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	39.3	16.0	31.9	18.1
LOS	B	D	B	C	B
Approach Delay	18.0		18.2	28.4	
Approach LOS	B		B	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 54.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	755	143	72	684	243	83
Future Volume (veh/h)	755	143	72	684	243	83
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	848	161	81	769	273	75
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1174	223	105	1007	395	373
Arrive On Green	0.41	0.41	0.06	0.56	0.24	0.24
Sat Flow, veh/h	2945	542	1619	1800	1619	1530
Grp Volume(v), veh/h	508	501	81	769	273	75
Grp Sat Flow(s),veh/h/ln	1710	1687	1619	1800	1619	1530
Q Serve(g_s), s	13.7	13.7	2.7	18.1	8.4	2.1
Cycle Q Clear(g_c), s	13.7	13.7	2.7	18.1	8.4	2.1
Prop In Lane		0.32	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	703	694	105	1007	395	373
V/C Ratio(X)	0.72	0.72	0.77	0.76	0.69	0.20
Avail Cap(c_a), veh/h	803	792	159	1173	395	373
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	13.5	25.3	9.3	18.9	16.5
Incr Delay (d2), s/veh	2.8	2.8	5.4	2.6	9.5	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	6.8	1.4	9.5	4.8	1.0
LnGrp Delay(d),s/veh	16.3	16.3	30.7	11.9	28.4	17.7
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	1009			850	348	
Approach Delay, s/veh	16.3			13.7	26.1	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.1	28.8				36.9		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	4.7	15.7				20.1		10.4
Green Ext Time (p_c), s	0.0	6.9				9.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	118.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	408	419	12	5	504	126	20	20	18	97	13	233
Future Vol, veh/h	408	419	12	5	504	126	20	20	18	97	13	233
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	429	441	13	5	531	133	21	21	19	102	14	245

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	664	0	0	456	0	0	2045	1983	230	1699	1923	598
Stage 1	-	-	-	-	-	-	1308	1308	-	608	608	-
Stage 2	-	-	-	-	-	-	737	675	-	1091	1315	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	935	-	-	1115	-	-	37	62	779	~ 67	68	506
Stage 1	-	-	-	-	-	-	171	231	-	486	489	-
Stage 2	-	-	-	-	-	-	413	456	-	233	230	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	935	-	-	1114	-	-	~ 11	33	777	~ 6	37	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	123	22	-	~ 67	97	-
Stage 1	-	-	-	-	-	-	92	125	-	263	486	-
Stage 2	-	-	-	-	-	-	206	454	-	~ 102	124	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.9	0.1	297.8	$ 580.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	53	935	-	-	1114	-	-	168
HCM Lane V/C Ratio	1.152	0.459	-	-	0.005	-	-	2.149
HCM Control Delay (s)	297.8	12.1	-	-	8.2	-	-	$ 580.9
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	5.3	2.5	-	-	0	-	-	28.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	408	17	26	553	8	64	0	22	2	0	16
Future Vol, veh/h	109	408	17	26	553	8	64	0	22	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	448	19	29	608	9	70	0	24	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	616	0	0	468	0	0	1374	1370	235	1130	1374	612
Stage 1	-	-	-	-	-	-	696	696	-	669	669	-
Stage 2	-	-	-	-	-	-	678	674	-	461	705	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	974	-	-	1104	-	-	115	148	773	171	147	497
Stage 1	-	-	-	-	-	-	403	446	-	450	459	-
Stage 2	-	-	-	-	-	-	445	457	-	555	442	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	974	-	-	1104	-	-	99	127	772	147	126	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	236	264	-	147	126	-
Stage 1	-	-	-	-	-	-	354	392	-	395	447	-
Stage 2	-	-	-	-	-	-	418	445	-	472	388	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.4	23.6	14.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	287	974	-	-	1104	-	-	393
HCM Lane V/C Ratio	0.329	0.122	-	-	0.026	-	-	0.05
HCM Control Delay (s)	23.6	9.2	-	-	8.3	-	-	14.6
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.4	0.4	-	-	0.1	-	-	0.2

Intersection	
Intersection Delay, s/veh	31.2
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	232	0	201	0	0	0	0	0	325	473	0
Future Vol, veh/h	0	232	0	201	0	0	0	0	0	325	473	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	249	0	216	0	0	0	0	0	349	509	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	18.1	45.6
HCM LOS	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	325	473	232	201	123	260
LT Vol	325	0	232	0	0	0
Through Vol	0	473	0	0	123	0
RT Vol	0	0	0	201	0	260
Lane Flow Rate	349	509	249	216	132	280
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.717	0.972	0.567	0.417	0.278	0.531
Departure Headway (Hd)	7.389	6.877	8.18	6.953	7.554	6.834
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	493	529	444	519	476	528
Service Time	5.11	4.598	5.897	4.67	5.294	4.573
HCM Lane V/C Ratio	0.708	0.962	0.561	0.416	0.277	0.53
HCM Control Delay	26.7	58.6	21.1	14.6	13.2	17.1
HCM Lane LOS	D	F	C	B	B	C
HCM 95th-tile Q	5.7	12.9	3.4	2	1.1	3.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

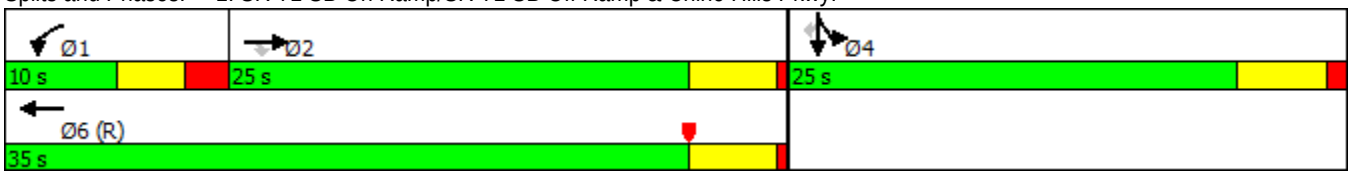
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↑	↱
Traffic Vol, veh/h	0	0	123	260
Future Vol, veh/h	0	0	123	260
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	132	280
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	15.8
HCM LOS	C

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1208	715	18	1003	447	245	721
Future Volume (vph)	1208	715	18	1003	447	245	721
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	28.5	28.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.48	0.48	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.43	0.78	0.14	0.61	0.70	0.66	1.29
Control Delay	11.7	13.2	37.1	9.5	26.6	23.9	164.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	13.2	37.1	9.5	26.6	23.9	164.0
LOS	B	B	D	A	C	C	F
Approach Delay	12.2			10.0		96.0	
Approach LOS	B			A		F	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.29	
Intersection Signal Delay: 38.9	Intersection LOS: D
Intersection Capacity Utilization 84.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1208	715	18	1003	0	0	0	0	447	245	721
Future Volume (veh/h)	0	1208	715	18	1003	0	0	0	0	447	245	721
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	1272	627	19	1056	0				364	407	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2492	607	37	1738	0				540	600	510
Arrive On Green	0.00	0.40	0.40	0.05	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6444	1508	1619	3510	0				1619	1800	1530
Grp Volume(v), veh/h	0	1272	627	19	1056	0				364	407	0
Grp Sat Flow(s),veh/h/ln	0	1548	1508	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	9.3	24.1	0.7	0.0	0.0				11.6	11.7	0.0
Cycle Q Clear(g_c), s	0.0	9.3	24.1	0.7	0.0	0.0				11.6	11.7	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2492	607	37	1739	0				540	600	510
V/C Ratio(X)	0.00	0.51	1.03	0.52	0.61	0.00				0.67	0.68	0.00
Avail Cap(c_a), veh/h	0	2492	607	135	1739	0				540	600	510
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.74	0.74	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.5	17.9	28.3	0.0	0.0				17.2	17.2	0.0
Incr Delay (d2), s/veh	0.0	0.2	45.4	3.1	1.2	0.0				6.6	6.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	17.6	0.3	0.3	0.0				6.1	6.8	0.0
LnGrp Delay(d),s/veh	0.0	13.7	63.4	31.4	1.2	0.0				23.8	23.3	0.0
LnGrp LOS		B	F	C	A					C	C	
Approach Vol, veh/h		1899			1075						771	
Approach Delay, s/veh		30.1			1.7						23.5	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.4	28.6		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	2.7	26.1		13.7		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.5		22.5		

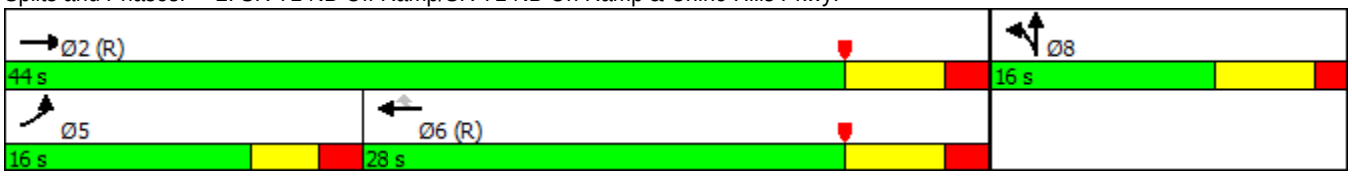
Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	427	1228	656	651	366	110
Future Volume (vph)	427	1228	656	651	366	110
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	37.5	21.5	21.5	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	0.85	0.62	0.58	1.02	0.80	0.60
Control Delay	40.2	9.8	17.9	56.6	51.6	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	9.8	17.9	56.6	51.6	28.4
LOS	D	A	B	E	D	C
Approach Delay		17.6	37.1			37.3
Approach LOS		B	D			D

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 27.8	Intersection LOS: C
Intersection Capacity Utilization 84.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	427	1228	0	0	656	651	366	110	5	0	0	0
Future Volume (veh/h)	427	1228	0	0	656	651	366	110	5	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1600	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	459	1320	0	0	705	697	394	118	1			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	542	2138	0	0	1226	540	540	297	3			
Arrive On Green	0.18	0.63	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	2956	3510	0	0	3510	1508	3238	1782	15			
Grp Volume(v), veh/h	459	1320	0	0	705	697	394	0	119			
Grp Sat Flow(s),veh/h/ln	1478	1710	0	0	1710	1508	1619	0	1797			
Q Serve(g_s), s	9.0	14.1	0.0	0.0	10.0	21.5	6.9	0.0	3.5			
Cycle Q Clear(g_c), s	9.0	14.1	0.0	0.0	10.0	21.5	6.9	0.0	3.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.01			
Lane Grp Cap(c), veh/h	542	2138	0	0	1226	540	540	0	300			
V/C Ratio(X)	0.85	0.62	0.00	0.00	0.58	1.29	0.73	0.00	0.40			
Avail Cap(c_a), veh/h	542	2138	0	0	1226	540	540	0	300			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.86	0.86	0.00	0.00	0.38	0.38	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.7	6.9	0.0	0.0	15.6	19.3	23.7	0.0	22.3			
Incr Delay (d2), s/veh	10.5	1.2	0.0	0.0	0.8	135.8	8.4	0.0	3.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.4	6.9	0.0	0.0	4.8	29.2	3.7	0.0	2.1			
LnGrp Delay(d),s/veh	34.2	8.0	0.0	0.0	16.3	155.1	32.2	0.0	26.2			
LnGrp LOS	C	A			B	F	C		C			
Approach Vol, veh/h		1779			1402			513				
Approach Delay, s/veh		14.8			85.3			30.8				
Approach LOS		B			F			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			16.0	28.0		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		16.1			11.0	23.5		8.9
Green Ext Time (p_c), s		16.8			0.0	0.0		0.3

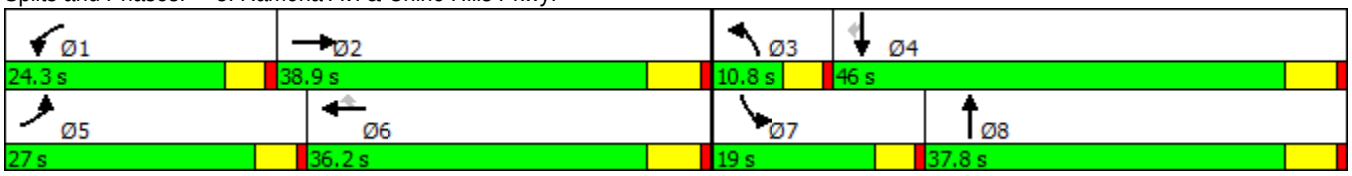
Intersection Summary	
HCM 2010 Ctrl Delay	43.8
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	266	965	148	851	149	23	307	169	482	433
Future Volume (vph)	266	965	148	851	149	23	307	169	482	433
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	22.0	37.1	15.4	30.4	30.4	5.8	32.0	14.3	44.5	44.5
Actuated g/C Ratio	0.18	0.31	0.13	0.25	0.25	0.05	0.27	0.12	0.37	0.37
v/c Ratio	0.95	0.68	0.76	1.04	0.32	0.31	0.53	0.93	0.40	0.55
Control Delay	90.3	39.4	72.3	85.3	7.2	65.7	34.6	102.0	30.0	5.7
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.3	39.8	72.3	85.3	7.2	65.7	34.6	102.0	30.0	5.7
LOS	F	D	E	F	A	E	C	F	C	A
Approach Delay		50.7		73.5			36.1		31.5	
Approach LOS		D		E			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.6	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 50.3	Intersection LOS: D
Intersection Capacity Utilization 95.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	965	2	148	851	149	23	307	145	169	482	433
Future Volume (veh/h)	266	965	2	148	851	149	23	307	145	169	482	433
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	283	1027	2	157	905	114	24	327	99	180	513	351
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	302	1660	3	182	866	382	37	690	205	194	1244	548
Arrive On Green	0.19	0.33	0.33	0.11	0.25	0.25	0.02	0.27	0.27	0.12	0.36	0.36
Sat Flow, veh/h	1619	5064	10	1619	3420	1509	1619	2589	770	1619	3420	1507
Grp Volume(v), veh/h	283	664	365	157	905	114	24	214	212	180	513	351
Grp Sat Flow(s),veh/h/ln	1619	1638	1798	1619	1710	1509	1619	1710	1649	1619	1710	1507
Q Serve(g_s), s	20.7	20.5	20.5	11.4	30.4	7.3	1.8	12.6	13.0	13.2	13.5	23.2
Cycle Q Clear(g_c), s	20.7	20.5	20.5	11.4	30.4	7.3	1.8	12.6	13.0	13.2	13.5	23.2
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	302	1074	589	182	866	382	37	456	440	194	1244	548
V/C Ratio(X)	0.94	0.62	0.62	0.86	1.04	0.30	0.65	0.47	0.48	0.93	0.41	0.64
Avail Cap(c_a), veh/h	302	1074	589	266	866	382	84	456	440	194	1244	548
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.1	34.0	34.0	52.4	44.8	36.2	58.1	36.9	37.0	52.3	28.6	31.7
Incr Delay (d2), s/veh	34.9	1.3	2.3	12.9	42.8	0.6	6.8	3.4	3.7	43.6	1.0	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	9.4	10.5	5.8	19.5	3.1	0.9	6.4	6.3	8.3	6.5	10.4
LnGrp Delay(d),s/veh	83.0	35.3	36.3	65.2	87.6	36.8	64.9	40.3	40.8	95.8	29.6	37.3
LnGrp LOS	F	D	D	E	F	D	E	D	D	F	C	D
Approach Vol, veh/h		1312			1176			450			1044	
Approach Delay, s/veh		45.9			79.7			41.8			43.6	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.1	45.1	7.4	49.4	27.0	36.2	19.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	13.4	22.5	3.8	25.2	22.7	32.4	15.2	15.0
Green Ext Time (p_c), s	0.1	9.0	0.0	6.0	0.0	0.0	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	54.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	958	129	48	970	94	29
Future Vol, veh/h	958	129	48	970	94	29
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1064	143	53	1078	104	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1067	0	1713	535
Stage 1	-	-	-	-	1067	-
Stage 2	-	-	-	-	646	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	661	-	~ 83	495
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	661	-	~ 76	494
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	295	-
Stage 2	-	-	-	-	450	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	30.2
HCM LOS			D

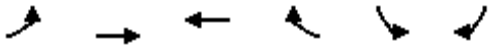
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	276	-	-	661	-
HCM Lane V/C Ratio	0.495	-	-	0.081	-
HCM Control Delay (s)	30.2	-	-	10.9	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.6	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	129	858	767	63	251
Future Volume (vph)	129	858	767	63	251
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	12.0	47.4	30.7	23.6	36.8
Actuated g/C Ratio	0.14	0.57	0.37	0.29	0.44
v/c Ratio	0.60	0.48	0.72	0.08	0.38
Control Delay	45.9	10.8	25.8	26.2	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	10.8	25.8	26.2	11.2
LOS	D	B	C	C	B
Approach Delay		15.4	25.8	14.2	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 82.8	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 62.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	129	858	767	65	63	251
Future Volume (veh/h)	129	858	767	65	63	251
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1600	1800
Adj Flow Rate, veh/h	140	933	834	69	68	87
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	171	2077	1437	119	774	562
Arrive On Green	0.11	0.61	0.45	0.45	0.26	0.26
Sat Flow, veh/h	1619	3510	3282	264	2956	1530
Grp Volume(v), veh/h	140	933	447	456	68	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1746	1478	1530
Q Serve(g_s), s	7.5	13.1	17.2	17.2	1.5	3.4
Cycle Q Clear(g_c), s	7.5	13.1	17.2	17.2	1.5	3.4
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	171	2077	770	786	774	562
V/C Ratio(X)	0.82	0.45	0.58	0.58	0.09	0.15
Avail Cap(c_a), veh/h	519	3287	1007	1028	774	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.8	9.4	18.1	18.1	24.7	18.8
Incr Delay (d2), s/veh	3.7	0.2	1.0	1.0	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	6.2	8.3	8.5	0.7	3.6
LnGrp Delay(d),s/veh	42.5	9.6	19.1	19.1	25.0	19.4
LnGrp LOS	D	A	B	B	C	B
Approach Vol, veh/h		1073	903		155	
Approach Delay, s/veh		13.9	19.1		21.8	
Approach LOS		B	B		C	

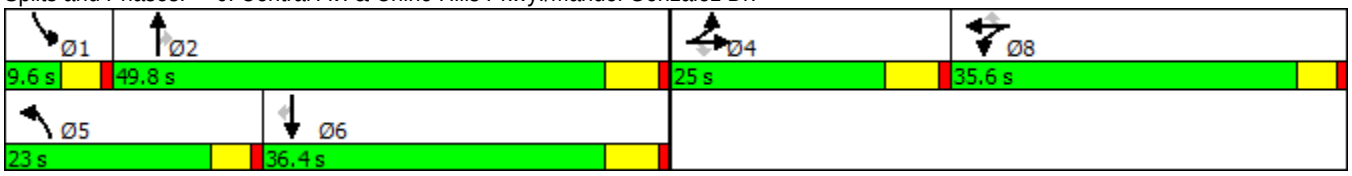
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		59.6		29.0	13.9	45.7		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		15.1		5.4	9.5	19.2		
Green Ext Time (p_c), s		30.2		0.4	0.1	20.7		

Intersection Summary	
HCM 2010 Ctrl Delay	16.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	2	447	12	43	35	396	792	1	11	881	240
Future Volume (vph)	514	2	447	12	43	35	396	792	1	11	881	240
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	0.94	0.89	0.71	0.06	0.19	0.11	1.43	0.48	0.00	0.15	0.91	0.46
Control Delay	81.7	71.9	10.2	37.7	40.4	0.7	246.4	19.1	0.0	54.5	47.9	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.7	71.9	10.2	37.7	40.4	0.7	246.4	19.1	0.0	54.5	47.9	16.3
LOS	F	E	B	D	D	A	F	B	A	D	D	B
Approach Delay		45.9			24.6			94.7			41.2	
Approach LOS		D			C			F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.43	
Intersection Signal Delay: 61.0	Intersection LOS: E
Intersection Capacity Utilization 86.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	514	2	447	12	43	35	396	792	1	11	881	240
Future Volume (veh/h)	514	2	447	12	43	35	396	792	1	11	881	240
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	560	0	358	13	47	21	430	861	1	12	958	191
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	631	0	298	156	174	147	302	1652	738	23	1062	469
Arrive On Green	0.19	0.00	0.19	0.10	0.10	0.10	0.19	0.48	0.48	0.01	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	560	0	358	13	47	21	430	861	1	12	958	191
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	16.6	0.0	19.2	0.7	2.4	1.2	18.4	17.1	0.0	0.7	26.4	9.8
Cycle Q Clear(g_c), s	16.6	0.0	19.2	0.7	2.4	1.2	18.4	17.1	0.0	0.7	26.4	9.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	631	0	298	156	174	147	302	1652	738	23	1062	469
V/C Ratio(X)	0.89	0.00	1.20	0.08	0.27	0.14	1.42	0.52	0.00	0.52	0.90	0.41
Avail Cap(c_a), veh/h	631	0	298	509	566	479	302	1652	738	82	1062	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	0.0	39.7	40.5	41.3	40.8	40.1	17.6	13.2	48.2	32.5	26.8
Incr Delay (d2), s/veh	14.4	0.0	117.9	0.2	0.8	0.4	208.2	1.2	0.0	6.6	12.2	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	0.0	17.8	0.3	1.2	0.5	25.6	8.3	0.0	0.4	14.3	4.4
LnGrp Delay(d),s/veh	53.0	0.0	157.6	40.8	42.1	41.2	248.3	18.8	13.2	54.9	44.7	29.4
LnGrp LOS	D		F	D	D	D	F	B	B	D	D	C
Approach Vol, veh/h		918			81			1292			1161	
Approach Delay, s/veh		93.8			41.7			95.1			42.3	
Approach LOS		F			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	53.4		25.0	23.0	36.4		14.1
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	19.1		21.2	20.4	28.4		4.4
Green Ext Time (p_c), s	0.0	18.3		0.0	0.0	2.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	75.8
HCM 2010 LOS	E

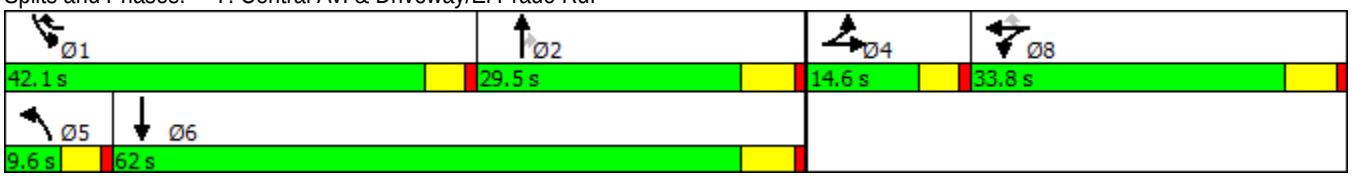
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	27	5	838	4	557	9	595	873	613	738
Future Volume (vph)	27	5	838	4	557	9	595	873	613	738
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	42.1	9.6	29.5	29.5	42.1	62.0
Total Split (%)	12.2%	12.2%	28.2%	28.2%	35.1%	8.0%	24.6%	24.6%	35.1%	51.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.0	10.0	28.1	28.1	71.5	5.0	23.8	23.8	37.6	64.1
Actuated g/C Ratio	0.09	0.09	0.24	0.24	0.61	0.04	0.20	0.20	0.32	0.55
v/c Ratio	0.20	0.17	1.19	1.13	0.57	0.13	0.89	1.15	1.23	0.29
Control Delay	55.2	26.0	148.7	127.1	10.9	59.8	62.7	98.1	156.6	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	26.0	148.7	127.1	10.9	59.8	62.7	98.1	156.6	15.5
LOS	E	C	F	F	B	E	E	F	F	B
Approach Delay		40.9		87.3			83.6			78.7
Approach LOS		D		F			F			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 117.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 82.7 — Intersection LOS: F
Intersection Capacity Utilization 116.0% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	5	21	838	4	557	9	595	873	613	738	18
Future Volume (veh/h)	27	5	21	838	4	557	9	595	873	613	738	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	28	5	13	876	0	429	9	620	733	639	769	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	107	29	76	770	0	851	18	688	303	515	2524	49
Arrive On Green	0.07	0.07	0.07	0.24	0.00	0.24	0.01	0.20	0.20	0.32	0.51	0.51
Sat Flow, veh/h	1619	443	1153	3238	0	1530	1619	3420	1508	1619	4960	97
Grp Volume(v), veh/h	28	0	18	876	0	429	9	620	733	639	508	276
Grp Sat Flow(s),veh/h/ln	1619	0	1597	1619	0	1530	1619	1710	1508	1619	1638	1781
Q Serve(g_s), s	1.9	0.0	1.3	28.0	0.0	20.4	0.7	20.8	23.7	37.5	10.6	10.6
Cycle Q Clear(g_c), s	1.9	0.0	1.3	28.0	0.0	20.4	0.7	20.8	23.7	37.5	10.6	10.6
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	107	0	105	770	0	851	18	688	303	515	1667	906
V/C Ratio(X)	0.26	0.00	0.17	1.14	0.00	0.50	0.51	0.90	2.42	1.24	0.30	0.31
Avail Cap(c_a), veh/h	137	0	136	770	0	851	69	688	303	515	1667	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	0.0	52.0	44.9	0.0	16.1	57.9	45.9	47.0	40.1	16.8	16.8
Incr Delay (d2), s/veh	0.5	0.0	0.3	77.5	0.0	0.5	8.4	17.2	647.2	123.6	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.6	20.7	0.0	8.6	0.3	11.5	64.3	34.3	4.9	5.4
LnGrp Delay(d),s/veh	52.7	0.0	52.2	122.4	0.0	16.6	66.3	63.1	694.2	163.7	17.3	17.7
LnGrp LOS	D		D	F		B	E	E	F	F	B	B
Approach Vol, veh/h		46			1305			1362			1423	
Approach Delay, s/veh		52.5			87.6			402.8			83.1	
Approach LOS		D			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	42.1	29.5		12.4	5.9	65.7		33.8
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	37.5	23.7		10.0	5.0	56.2		28.0
Max Q Clear Time (g_c+I1), s	39.5	25.7		3.9	2.7	12.6		30.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	26.4		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		189.5
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1358	938	164
Future Volume (vph)	1358	938	164
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	84.6	84.6	25.9
Actuated g/C Ratio	0.70	0.70	0.22
v/c Ratio	0.55	0.28	1.07dr
Control Delay	6.0	7.2	52.5
Queue Delay	0.0	0.0	0.0
Total Delay	6.0	7.2	52.5
LOS	A	A	D
Approach Delay	6.0	7.2	52.5
Approach LOS	A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1358	397	0	938	164	355
Future Volume (veh/h)	1358	397	0	938	164	355
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	0	1800	1700	1800
Adj Flow Rate, veh/h	1429	418	0	987	173	213
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2888	839	0	3751	255	241
Arrive On Green	1.00	1.00	0.00	0.76	0.16	0.16
Sat Flow, veh/h	3945	1099	0	5238	1619	1530
Grp Volume(v), veh/h	1236	611	0	987	173	213
Grp Sat Flow(s),veh/h/ln	1638	1606	0	1638	1619	1530
Q Serve(g_s), s	0.0	0.0	0.0	7.1	12.1	16.4
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.1	12.1	16.4
Prop In Lane		0.68	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2501	1226	0	3751	255	241
V/C Ratio(X)	0.49	0.50	0.00	0.26	0.68	0.88
Avail Cap(c_a), veh/h	2501	1226	0	3751	540	510
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.2	47.7	49.5
Incr Delay (d2), s/veh	0.7	1.4	0.0	0.2	1.2	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.0	3.3	5.5	7.2
LnGrp Delay(d),s/veh	0.7	1.4	0.0	4.4	48.9	53.7
LnGrp LOS	A	A		A	D	D
Approach Vol, veh/h	1847			987	386	
Approach Delay, s/veh	0.9			4.4	51.5	
Approach LOS	A			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		96.1				96.1		23.9
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				9.1		18.4
Green Ext Time (p_c), s		24.0				23.4		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.1
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	747	91	740	1007	0
Future Volume (vph)	747	91	740	1007	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	31.1	31.1	31.1	80.9	80.9
Actuated g/C Ratio	0.26	0.26	0.26	0.67	0.67
v/c Ratio	0.59	0.20	0.87	0.88	0.92
Control Delay	41.4	8.2	46.1	27.9	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	8.2	46.1	27.9	32.5
LOS	D	A	D	C	C
Approach Delay	37.8		46.1		30.2
Approach LOS	D		D		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 36.6	Intersection LOS: D
Intersection Capacity Utilization 86.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	747	91	0	740	363	0	0	0	1007	0	813
Future Volume (veh/h)	0	747	91	0	740	363	0	0	0	1007	0	813
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	755	0	0	747	367				856	226	695
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1608	501	0	1072	501				981	236	727
Arrive On Green	0.00	0.33	0.00	0.00	0.11	0.11				0.61	0.61	0.61
Sat Flow, veh/h	0	5076	1530	0	3438	1530				1619	390	1199
Grp Volume(v), veh/h	0	755	0	0	747	367				856	0	921
Grp Sat Flow(s),veh/h/ln	0	1638	1530	0	1638	1530				1619	0	1588
Q Serve(g_s), s	0.0	14.7	0.0	0.0	26.4	27.9				53.0	0.0	65.2
Cycle Q Clear(g_c), s	0.0	14.7	0.0	0.0	26.4	27.9				53.0	0.0	65.2
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.75
Lane Grp Cap(c), veh/h	0	1608	501	0	1072	501				981	0	963
V/C Ratio(X)	0.00	0.47	0.00	0.00	0.70	0.73				0.87	0.00	0.96
Avail Cap(c_a), veh/h	0	1608	501	0	1072	501				1100	0	1079
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	32.1	0.0	0.0	47.8	48.4				19.8	0.0	22.2
Incr Delay (d2), s/veh	0.0	1.0	0.0	0.0	3.8	9.2				6.7	0.0	16.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.8	0.0	0.0	12.6	13.1				25.4	0.0	32.8
LnGrp Delay(d),s/veh	0.0	33.1	0.0	0.0	51.5	57.6				26.4	0.0	38.5
LnGrp LOS		C			D	E				C		D
Approach Vol, veh/h		755			1114						1777	
Approach Delay, s/veh		33.1			53.5						32.7	
Approach LOS		C			D						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		43.8		76.2		43.8		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		16.7		67.2		29.9		
Green Ext Time (p_c), s		8.2		5.5		0.5		

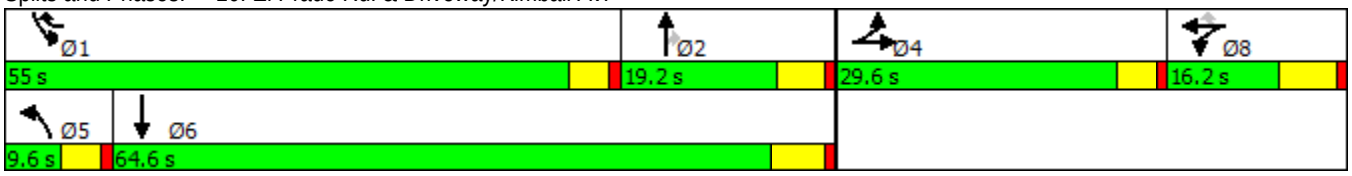
Intersection Summary	
HCM 2010 Ctrl Delay	39.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	37	9	3	1029	4	210	25	1061	366
Future Volume (vph)	37	9	3	1029	4	210	25	1061	366
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	55.0	9.6	19.2	19.2	55.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	45.8%	8.0%	16.0%	16.0%	45.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.8	12.8	10.4	60.9	5.2	14.6	14.6	52.4	61.2
Actuated g/C Ratio	0.13	0.13	0.11	0.64	0.05	0.15	0.15	0.55	0.64
v/c Ratio	0.18	0.08	0.15	0.91	0.05	0.81	0.07	1.26	0.18
Control Delay	42.9	29.4	48.4	21.0	53.2	66.3	0.4	152.1	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	29.4	48.4	21.0	53.2	66.3	0.4	152.1	10.8
LOS	D	C	D	C	D	E	A	F	B
Approach Delay		38.6	21.7			59.2			114.8
Approach LOS		D	C			E			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 73.3	Intersection LOS: E
Intersection Capacity Utilization 99.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	9	9	24	3	1029	4	210	25	1061	366	14
Future Volume (veh/h)	37	9	9	24	3	1029	4	210	25	1061	366	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	39	9	7	25	3	632	4	221	25	1117	385	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	124	72	56	149	18	892	78	243	207	788	1931	70
Arrive On Green	0.08	0.08	0.08	0.10	0.10	0.10	0.05	0.14	0.14	0.49	0.57	0.57
Sat Flow, veh/h	1619	940	731	1538	185	1530	1619	1800	1530	1619	3366	122
Grp Volume(v), veh/h	39	0	16	28	0	632	4	221	25	1117	195	204
Grp Sat Flow(s),veh/h/ln	1619	0	1671	1723	0	1530	1619	1800	1530	1619	1710	1778
Q Serve(g_s), s	2.4	0.0	0.9	1.5	0.0	10.0	0.2	12.5	1.5	50.4	5.7	5.7
Cycle Q Clear(g_c), s	2.4	0.0	0.9	1.5	0.0	10.0	0.2	12.5	1.5	50.4	5.7	5.7
Prop In Lane	1.00		0.44	0.89		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	124	0	128	166	0	892	78	243	207	788	981	1020
V/C Ratio(X)	0.31	0.00	0.12	0.17	0.00	0.71	0.05	0.91	0.12	1.42	0.20	0.20
Avail Cap(c_a), veh/h	391	0	403	166	0	892	78	243	207	788	981	1020
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	44.6	43.0	0.0	15.3	47.0	44.1	39.4	26.6	10.6	10.6
Incr Delay (d2), s/veh	1.4	0.0	0.4	0.5	0.0	2.6	0.1	34.2	0.3	195.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.4	0.8	0.0	13.3	0.1	8.6	0.6	65.1	2.7	2.8
LnGrp Delay(d),s/veh	46.6	0.0	45.0	43.4	0.0	17.9	47.1	78.4	39.6	221.9	10.7	10.7
LnGrp LOS	D		D	D		B	D	E	D	F	B	B
Approach Vol, veh/h		55			660			250			1516	
Approach Delay, s/veh		46.2			19.0			74.0			166.3	
Approach LOS		D			B			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	55.0	19.8		12.5	9.6	65.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	50.4	* 14		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	52.4	14.5		4.4	2.2	7.7		12.0
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	3.7		0.0

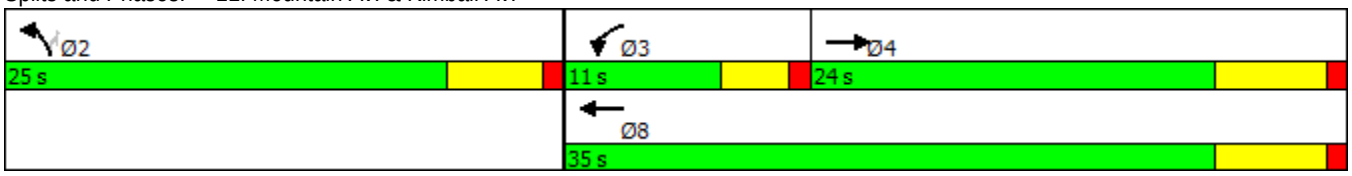
Intersection Summary		
HCM 2010 Ctrl Delay		115.1
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1097	50	903	150	145
Future Volume (vph)	1097	50	903	150	145
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	24.0	11.0	35.0	25.0	25.0
Total Split (%)	40.0%	18.3%	58.3%	41.7%	41.7%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	18.7	7.3	22.3	10.0	10.0
Actuated g/C Ratio	0.42	0.17	0.51	0.23	0.23
v/c Ratio	0.91	0.21	0.57	0.45	0.34
Control Delay	27.9	22.0	9.5	19.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	22.0	9.5	19.8	5.7
LOS	C	C	A	B	A
Approach Delay	27.9		10.1	12.9	
Approach LOS	C		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 44	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1097	94	50	903	150	145
Future Volume (veh/h)	1097	94	50	903	150	145
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1205	101	55	992	165	136
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1312	110	126	1985	260	246
Arrive On Green	0.41	0.41	0.08	0.58	0.16	0.16
Sat Flow, veh/h	3285	267	1619	3510	1619	1530
Grp Volume(v), veh/h	644	662	55	992	165	136
Grp Sat Flow(s),veh/h/ln	1710	1753	1619	1710	1619	1530
Q Serve(g_s), s	15.5	15.6	1.4	7.5	4.2	3.6
Cycle Q Clear(g_c), s	15.5	15.6	1.4	7.5	4.2	3.6
Prop In Lane		0.15	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	702	720	126	1985	260	246
V/C Ratio(X)	0.92	0.92	0.44	0.50	0.64	0.55
Avail Cap(c_a), veh/h	706	723	260	2274	731	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.1	12.2	19.2	5.4	17.1	16.9
Incr Delay (d2), s/veh	16.5	16.6	0.9	0.1	1.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	10.7	0.7	3.5	1.9	1.5
LnGrp Delay(d),s/veh	28.6	28.7	20.1	5.5	18.1	17.6
LnGrp LOS	C	C	C	A	B	B
Approach Vol, veh/h	1306			1047	301	
Approach Delay, s/veh	28.7			6.2	17.9	
Approach LOS	C			A	B	

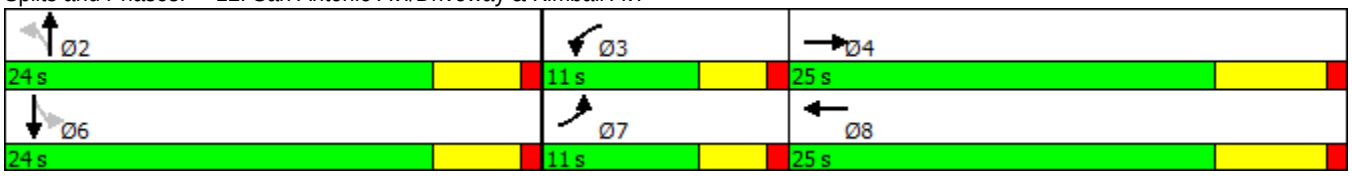
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		12.3	7.4	23.9				31.3
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		19.7	7.0	18.0				29.0
Max Q Clear Time (g_c+I1), s		6.2	3.4	17.6				9.5
Green Ext Time (p_c), s		0.2	0.0	0.3				7.3

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	25	1197	15	886	66	0	76	0
Future Volume (vph)	25	1197	15	886	66	0	76	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	23.0	11.0	23.0	22.9	22.9	22.9	22.9
Total Split (s)	11.0	25.0	11.0	25.0	24.0	24.0	24.0	24.0
Total Split (%)	18.3%	41.7%	18.3%	41.7%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	19.7	7.2	19.7	9.1	9.1	9.1	9.1
Actuated g/C Ratio	0.17	0.47	0.17	0.47	0.22	0.22	0.22	0.22
v/c Ratio	0.09	0.81	0.06	0.59	0.25	0.03	0.29	0.02
Control Delay	19.0	18.4	18.8	12.7	16.3	0.1	17.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	18.4	18.8	12.7	16.3	0.1	17.0	0.0
LOS	B	B	B	B	B	A	B	A
Approach Delay		18.4		12.8		12.8		15.2
Approach LOS		B		B		B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 41.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1197	43	15	886	12	66	0	18	76	0	9
Future Volume (veh/h)	25	1197	43	15	886	12	66	0	18	76	0	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	26	1260	45	16	933	13	69	0	17	80	0	9
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	1472	53	46	1456	20	400	0	261	392	0	261
Arrive On Green	0.04	0.44	0.44	0.03	0.42	0.42	0.17	0.00	0.17	0.17	0.00	0.17
Sat Flow, veh/h	1619	3369	120	1619	3452	48	1349	0	1530	1339	0	1530
Grp Volume(v), veh/h	26	639	666	16	462	484	69	0	17	80	0	9
Grp Sat Flow(s),veh/h/ln	1619	1710	1779	1619	1710	1790	1349	0	1530	1339	0	1530
Q Serve(g_s), s	0.6	13.8	13.8	0.4	8.8	8.8	1.8	0.0	0.4	2.2	0.0	0.2
Cycle Q Clear(g_c), s	0.6	13.8	13.8	0.4	8.8	8.8	2.0	0.0	0.4	2.6	0.0	0.2
Prop In Lane	1.00		0.07	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	747	777	46	721	755	400	0	261	392	0	261
V/C Ratio(X)	0.37	0.86	0.86	0.35	0.64	0.64	0.17	0.00	0.07	0.20	0.00	0.03
Avail Cap(c_a), veh/h	277	793	825	277	793	830	798	0	713	788	0	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.0	10.4	10.4	19.5	9.4	9.4	15.0	0.0	14.2	15.3	0.0	14.2
Incr Delay (d2), s/veh	1.2	8.1	7.9	1.7	1.0	1.0	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	8.1	8.4	0.2	4.3	4.5	0.7	0.0	0.2	0.8	0.0	0.1
LnGrp Delay(d),s/veh	20.2	18.5	18.3	21.2	10.4	10.4	15.1	0.0	14.3	15.4	0.0	14.2
LnGrp LOS	C	B	B	C	B	B	B		B	B		B
Approach Vol, veh/h		1331			962			86			89	
Approach Delay, s/veh		18.5			10.6			14.9			15.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	5.2	23.9		11.9	5.8	23.3
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		4.0	2.4	15.8		4.6	2.6	10.8
Green Ext Time (p_c), s		0.2	0.0	2.1		0.2	0.0	4.3

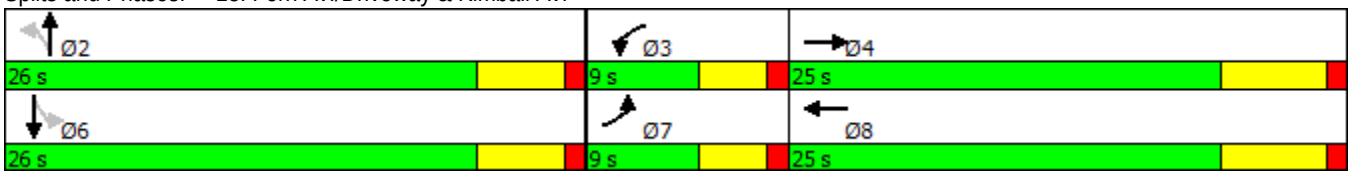
Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1263	12	826	49	1	191	8
Future Volume (vph)	20	1263	12	826	49	1	191	8
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	19.9	5.2	19.9	11.5	11.5	11.5	11.5
Actuated g/C Ratio	0.12	0.46	0.12	0.46	0.26	0.26	0.26	0.26
v/c Ratio	0.12	0.94	0.07	0.61	0.17	0.11	0.67	0.11
Control Delay	22.9	29.0	22.3	14.1	13.7	5.5	25.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	29.0	22.3	14.1	13.7	5.5	25.3	6.6
LOS	C	C	C	B	B	A	C	A
Approach Delay		28.9		14.2		10.0		21.9
Approach LOS		C		B		B		C

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 43.7
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 22.5 — Intersection LOS: C
Intersection Capacity Utilization 64.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1263	22	12	826	11	49	1	40	191	8	35
Future Volume (veh/h)	20	1263	22	12	826	11	49	1	40	191	8	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	23	1435	19	14	939	12	56	1	25	217	9	22
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	45	1497	20	29	1464	19	433	13	327	437	103	251
Arrive On Green	0.03	0.43	0.43	0.02	0.42	0.42	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1619	3455	46	1619	3457	44	1322	59	1480	1328	464	1135
Grp Volume(v), veh/h	23	710	744	14	464	487	56	0	26	217	0	31
Grp Sat Flow(s),veh/h/ln	1619	1710	1791	1619	1710	1791	1322	0	1539	1328	0	1600
Q Serve(g_s), s	0.6	17.9	17.9	0.4	9.6	9.6	1.6	0.0	0.6	6.9	0.0	0.7
Cycle Q Clear(g_c), s	0.6	17.9	17.9	0.4	9.6	9.6	2.3	0.0	0.6	7.5	0.0	0.7
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.96	1.00		0.71
Lane Grp Cap(c), veh/h	45	741	776	29	724	758	433	0	340	437	0	353
V/C Ratio(X)	0.51	0.96	0.96	0.48	0.64	0.64	0.13	0.00	0.08	0.50	0.00	0.09
Avail Cap(c_a), veh/h	182	741	776	182	741	776	768	0	729	773	0	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	12.2	12.2	21.7	10.2	10.2	14.7	0.0	13.7	16.7	0.0	13.8
Incr Delay (d2), s/veh	3.3	23.0	22.6	4.6	1.4	1.3	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	13.0	13.5	0.2	4.7	4.9	0.6	0.0	0.3	2.5	0.0	0.3
LnGrp Delay(d),s/veh	24.6	35.2	34.8	26.3	11.5	11.5	14.7	0.0	13.8	17.0	0.0	13.8
LnGrp LOS	C	D	C	C	B	B	B		B	B		B
Approach Vol, veh/h		1477			965			82			248	
Approach Delay, s/veh		34.8			11.7			14.4			16.6	
Approach LOS		C			B			B			B	

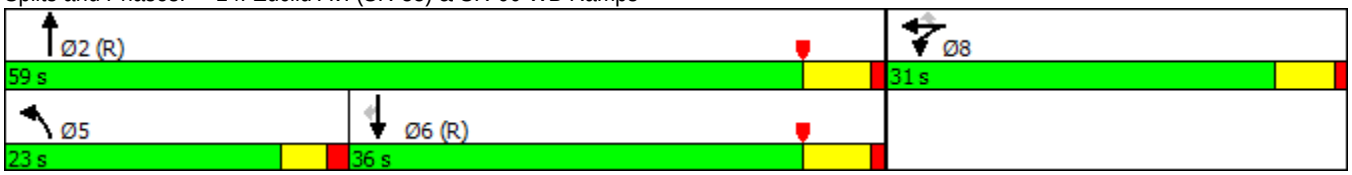
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.7	4.8	25.0		14.7	5.2	24.6
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		4.3	2.4	19.9		9.5	2.6	11.6
Green Ext Time (p_c), s		0.4	0.0	0.0		0.4	0.0	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	674	6	431	598	1109	968	560
Future Volume (vph)	674	6	431	598	1109	968	560
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	25.1	25.1	25.1	19.4	54.4	30.5	30.5
Actuated g/C Ratio	0.28	0.28	0.28	0.22	0.60	0.34	0.34
v/c Ratio	0.94	0.91	0.80	1.81	0.56	0.88	0.66
Control Delay	64.6	56.8	37.1	390.2	23.6	38.4	6.2
Queue Delay	0.0	0.0	0.0	0.0	5.2	0.0	0.0
Total Delay	64.6	56.8	37.1	390.2	28.8	38.4	6.2
LOS	E	E	D	F	C	D	A
Approach Delay		53.3			155.3	26.6	
Approach LOS		D			F	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.81	
Intersection Signal Delay: 84.0	Intersection LOS: F
Intersection Capacity Utilization 118.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	674	6	431	598	1109	0	0	968	560
Future Volume (veh/h)	0	0	0	674	6	431	598	1109	0	0	968	560
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				805	0	202	629	1167	0	0	1019	589
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				877	0	409	333	2095	0	0	1221	528
Arrive On Green				0.27	0.00	0.27	0.41	1.00	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3238	0	1510	1619	3510	0	0	3510	1480
Grp Volume(v), veh/h				805	0	202	629	1167	0	0	1019	589
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1619	1710	0	0	1710	1480
Q Serve(g_s), s				21.7	0.0	10.1	18.5	0.0	0.0	0.0	24.6	32.1
Cycle Q Clear(g_c), s				21.7	0.0	10.1	18.5	0.0	0.0	0.0	24.6	32.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				877	0	409	333	2095	0	0	1221	528
V/C Ratio(X)				0.92	0.00	0.49	1.89	0.56	0.00	0.00	0.83	1.12
Avail Cap(c_a), veh/h				935	0	436	333	2095	0	0	1221	528
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.8	0.0	27.6	26.5	0.0	0.0	0.0	26.5	28.9
Incr Delay (d2), s/veh				12.7	0.0	0.3	401.5	0.1	0.0	0.0	6.8	74.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.3	0.0	4.2	45.3	0.0	0.0	0.0	12.8	24.0
LnGrp Delay(d),s/veh				44.5	0.0	28.0	428.0	0.1	0.0	0.0	33.3	103.6
LnGrp LOS				D		C	F	A			C	F
Approach Vol, veh/h					1007			1796			1608	
Approach Delay, s/veh					41.2			150.0			59.1	
Approach LOS					D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		60.6			23.0	37.6		29.4
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		2.0			20.5	34.1		23.7
Green Ext Time (p_c), s		41.9			0.0	0.0		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	92.0
HCM 2010 LOS	F

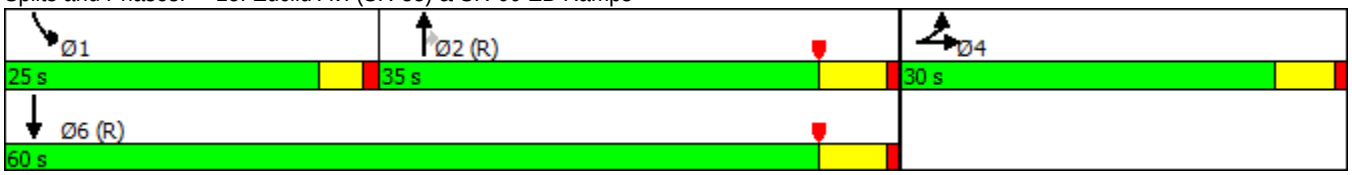
Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	400	2	1309	853	319	1324
Future Volume (vph)	400	2	1309	853	319	1324
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	25.0	25.0	30.5	30.5	20.0	54.5
Actuated g/C Ratio	0.28	0.28	0.34	0.34	0.22	0.61
v/c Ratio	0.86	1.42	1.15	0.93	0.91	0.65
Control Delay	52.4	228.6	109.6	24.6	52.4	5.6
Queue Delay	51.8	2.3	0.0	0.0	0.0	1.2
Total Delay	104.2	231.0	109.6	24.6	52.4	6.8
LOS	F	F	F	C	D	A
Approach Delay		184.4	76.1			15.7
Approach LOS		F	E			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 77.5 — Intersection LOS: E
Intersection Capacity Utilization 118.6% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	2	577	0	0	0	0	1309	853	319	1324	0
Future Volume (veh/h)	400	2	577	0	0	0	0	1309	853	319	1324	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	408	2	512				0	1336	870	326	1351	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	450	2	424				0	1172	509	353	2071	0
Arrive On Green	0.28	0.28	0.28				0.00	0.34	0.34	0.29	0.81	0.00
Sat Flow, veh/h	1619	6	1525				0	3510	1484	1619	3510	0
Grp Volume(v), veh/h	408	0	514				0	1336	870	326	1351	0
Grp Sat Flow(s),veh/h/ln	1619	0	1531				0	1710	1484	1619	1710	0
Q Serve(g_s), s	21.9	0.0	25.0				0.0	30.9	30.9	17.6	14.6	0.0
Cycle Q Clear(g_c), s	21.9	0.0	25.0				0.0	30.9	30.9	17.6	14.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	450	0	425				0	1172	509	353	2071	0
V/C Ratio(X)	0.91	0.00	1.21				0.00	1.14	1.71	0.92	0.65	0.00
Avail Cap(c_a), veh/h	450	0	425				0	1172	509	378	2071	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.45	0.45	0.32	0.32	0.00
Uniform Delay (d), s/veh	31.4	0.0	32.5				0.0	29.6	29.6	31.2	4.9	0.0
Incr Delay (d2), s/veh	21.4	0.0	114.1				0.0	68.0	323.6	11.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	0.0	24.0				0.0	25.6	58.3	8.9	6.6	0.0
LnGrp Delay(d),s/veh	52.8	0.0	146.6				0.0	97.6	353.2	42.2	5.4	0.0
LnGrp LOS	D		F					F	F	D	A	
Approach Vol, veh/h		922						2206			1677	
Approach Delay, s/veh		105.1						198.4			12.5	
Approach LOS		F						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.6	36.4		30.0		60.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	19.6	32.9		27.0		16.6		
Green Ext Time (p_c), s	0.1	0.0		0.0		36.2		

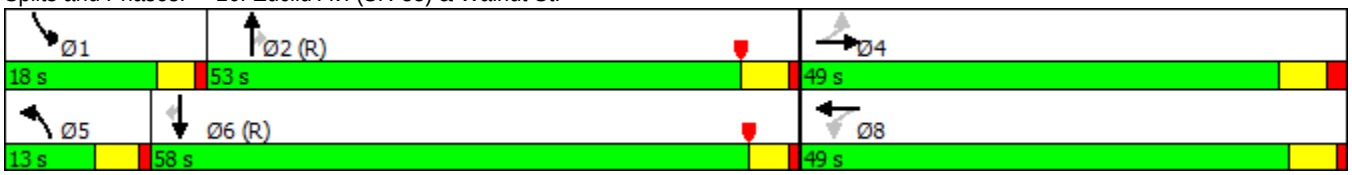
Intersection Summary		
HCM 2010 Ctrl Delay		115.6
HCM 2010 LOS		F

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	128	333	104	290	140	1820	77	338	1412	143
Future Volume (vph)	128	333	104	290	140	1820	77	338	1412	143
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	49.0	49.0	49.0	49.0	13.0	53.0	53.0	18.0	58.0	58.0
Total Split (%)	40.8%	40.8%	40.8%	40.8%	10.8%	44.2%	44.2%	15.0%	48.3%	48.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	28.2	28.2	29.2	29.2	19.3	55.4	55.4	20.3	56.8	56.8
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.16	0.46	0.46	0.17	0.47	0.47
v/c Ratio	0.93	0.62	0.83	0.52	0.56	0.84	0.11	0.71	0.63	0.19
Control Delay	102.0	37.6	85.1	34.1	73.2	9.0	0.1	56.0	25.8	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.0	37.6	85.1	34.1	73.2	9.0	0.1	56.0	25.8	3.7
LOS	F	D	F	C	E	A	A	E	C	A
Approach Delay		51.1		44.2		13.1			29.5	
Approach LOS		D		D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 27.0	Intersection LOS: C
Intersection Capacity Utilization 89.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	333	150	104	290	127	140	1820	77	338	1412	143
Future Volume (veh/h)	128	333	150	104	290	127	140	1820	77	338	1412	143
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	133	347	125	108	302	111	146	1896	57	352	1471	90
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	240	726	257	216	724	260	109	2256	692	333	2460	764
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.14	0.92	0.92	0.11	0.50	0.50
Sat Flow, veh/h	930	2467	873	884	2459	884	1619	4914	1508	2956	4914	1526
Grp Volume(v), veh/h	133	239	233	108	208	205	146	1896	57	352	1471	90
Grp Sat Flow(s),veh/h/ln	930	1710	1630	884	1710	1633	1619	1638	1508	1478	1638	1526
Q Serve(g_s), s	16.2	13.7	14.1	13.8	11.7	12.2	8.1	16.6	0.4	13.5	25.6	3.8
Cycle Q Clear(g_c), s	28.3	13.7	14.1	27.9	11.7	12.2	8.1	16.6	0.4	13.5	25.6	3.8
Prop In Lane	1.00		0.54	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	503	480	216	503	481	109	2256	692	333	2460	764
V/C Ratio(X)	0.56	0.47	0.49	0.50	0.41	0.43	1.34	0.84	0.08	1.06	0.60	0.12
Avail Cap(c_a), veh/h	297	608	580	278	623	595	109	2256	692	333	2460	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.71	0.71	0.71
Uniform Delay (d), s/veh	45.6	34.7	34.9	46.4	34.0	34.2	51.9	3.3	2.7	53.2	21.4	15.9
Incr Delay (d2), s/veh	2.0	0.7	0.8	1.8	0.5	0.6	156.9	0.4	0.0	57.9	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	6.6	6.5	3.5	5.6	5.5	8.3	6.4	0.2	8.2	11.8	1.6
LnGrp Delay(d),s/veh	47.6	35.4	35.6	48.2	34.6	34.8	208.8	3.7	2.7	111.2	22.1	16.1
LnGrp LOS	D	D	D	D	C	C	F	A	A	F	C	B
Approach Vol, veh/h		605			521			2099			1913	
Approach Delay, s/veh		38.2			37.5			18.0			38.2	
Approach LOS		D			D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	60.4		41.6	13.0	65.4		41.6
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	13.5	47.7		42.7	8.1	* 54		* 44
Max Q Clear Time (g_c+I1), s	15.5	18.6		30.3	10.1	27.6		29.9
Green Ext Time (p_c), s	0.0	24.7		5.0	0.0	22.4		5.3

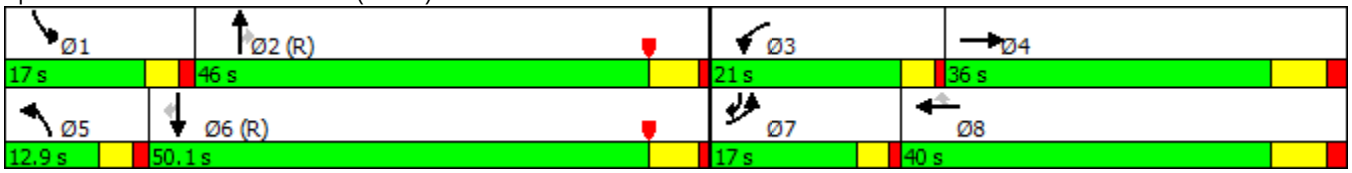
Intersection Summary			
HCM 2010 Ctrl Delay		29.9	
HCM 2010 LOS		C	

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	155	399	184	358	57	115	1712	294	135	1260	172
Future Volume (vph)	155	399	184	358	57	115	1712	294	135	1260	172
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.0	24.7	16.3	28.0	28.0	12.5	44.0	44.0	14.0	45.4	59.9
Actuated g/C Ratio	0.11	0.21	0.14	0.23	0.23	0.10	0.37	0.37	0.12	0.38	0.50
v/c Ratio	0.96	0.76	0.90	0.48	0.14	0.74	1.47	0.48	0.78	1.05	0.22
Control Delay	112.1	50.0	91.4	41.2	2.4	54.3	248.7	28.4	59.4	73.9	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.1	50.0	91.4	41.2	2.4	54.3	248.7	28.4	59.4	73.9	14.7
LOS	F	D	F	D	A	D	F	C	E	E	B
Approach Delay		64.9		52.9			207.6			66.1	
Approach LOS		E		D			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.47	
Intersection Signal Delay: 125.2	Intersection LOS: F
Intersection Capacity Utilization 102.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	399	93	184	358	57	115	1712	294	135	1260	172
Future Volume (veh/h)	155	399	93	184	358	57	115	1712	294	135	1260	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	167	429	66	198	385	61	124	1841	185	145	1355	87
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	175	581	89	222	765	337	113	1329	595	169	1446	803
Arrive On Green	0.11	0.20	0.20	0.14	0.22	0.22	0.02	0.13	0.13	0.03	0.14	0.14
Sat Flow, veh/h	1619	2975	455	1619	3420	1507	1619	3420	1530	1619	3420	1508
Grp Volume(v), veh/h	167	245	250	198	385	61	124	1841	185	145	1355	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	1507	1619	1710	1530	1619	1710	1508
Q Serve(g_s), s	12.3	16.2	16.4	14.4	11.8	3.9	8.4	46.6	13.2	10.7	47.1	4.9
Cycle Q Clear(g_c), s	12.3	16.2	16.4	14.4	11.8	3.9	8.4	46.6	13.2	10.7	47.1	4.9
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	175	334	336	222	765	337	113	1329	595	169	1446	803
V/C Ratio(X)	0.95	0.74	0.74	0.89	0.50	0.18	1.09	1.38	0.31	0.86	0.94	0.11
Avail Cap(c_a), veh/h	175	413	416	229	941	414	113	1329	595	169	1446	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.26	0.26	0.26	0.74	0.74	0.74
Uniform Delay (d), s/veh	53.2	45.4	45.5	50.9	40.7	37.7	58.6	52.3	37.7	57.1	50.0	21.4
Incr Delay (d2), s/veh	53.5	6.2	6.6	31.0	0.7	0.4	71.4	174.5	0.4	26.5	10.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	8.2	8.4	8.3	5.6	1.7	6.0	54.3	5.7	6.0	24.4	2.1
LnGrp Delay(d),s/veh	106.7	51.6	52.0	81.9	41.5	38.0	130.0	226.8	38.1	83.6	60.1	21.6
LnGrp LOS	F	D	D	F	D	D	F	F	D	F	E	C
Approach Vol, veh/h		662			644			2150			1587	
Approach Delay, s/veh		65.6			53.6			205.0			60.2	
Approach LOS		E			D			F			E	

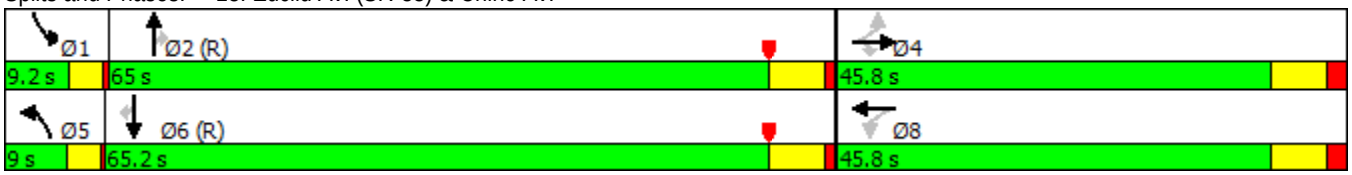
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	52.1	20.4	30.4	12.9	56.2	17.0	33.9
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	12.7	48.6	16.4	18.4	10.4	49.1	14.3	13.8
Green Ext Time (p_c), s	0.0	0.0	0.0	5.0	0.0	0.0	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	121.8
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	72	180	53	76	100	73	2068	222	16	1408	65
Future Volume (vph)	72	180	53	76	100	73	2068	222	16	1408	65
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	45.8	45.8	45.8	45.8	45.8	9.0	65.0	65.0	9.2	65.2	65.2
Total Split (%)	38.2%	38.2%	38.2%	38.2%	38.2%	7.5%	54.2%	54.2%	7.7%	54.3%	54.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	23.2	23.2	23.2		23.2	11.6	79.5	79.5	6.0	68.7	68.7
Actuated g/C Ratio	0.19	0.19	0.19		0.19	0.10	0.66	0.66	0.05	0.57	0.57
v/c Ratio	0.42	0.53	0.16		0.90	0.48	0.94	0.22	0.20	0.74	0.08
Control Delay	47.7	47.9	8.9		83.3	51.2	28.8	7.4	77.8	6.5	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	47.9	8.9		83.3	51.2	28.8	7.4	77.8	6.5	0.1
LOS	D	D	A		F	D	C	A	E	A	A
Approach Delay		41.0			83.3		27.5			7.0	
Approach LOS		D			F		C			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 106.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	180	53	76	100	24	73	2068	222	16	1408	65
Future Volume (veh/h)	72	180	53	76	100	24	73	2068	222	16	1408	65
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	74	186	55	78	103	21	75	2132	173	16	1452	38
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	233	406	345	118	143	26	74	2120	948	28	2022	885
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.09	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1216	1800	1530	341	636	113	1619	3420	1530	1619	3420	1497
Grp Volume(v), veh/h	74	186	55	202	0	0	75	2132	173	16	1452	38
Grp Sat Flow(s),veh/h/ln	1216	1800	1530	1089	0	0	1619	1710	1530	1619	1710	1497
Q Serve(g_s), s	0.0	10.7	3.5	12.2	0.0	0.0	5.5	0.0	0.0	1.2	0.0	0.0
Cycle Q Clear(g_c), s	11.2	10.7	3.5	22.9	0.0	0.0	5.5	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	0.39		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	233	406	345	287	0	0	74	2120	948	28	2022	885
V/C Ratio(X)	0.32	0.46	0.16	0.70	0.00	0.00	1.01	1.01	0.18	0.57	0.72	0.04
Avail Cap(c_a), veh/h	352	582	495	430	0	0	74	2120	948	77	2022	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	40.3	40.1	37.3	46.5	0.0	0.0	54.5	0.0	0.0	57.5	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.2	3.1	0.0	0.0	34.0	7.3	0.0	0.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.4	1.5	6.7	0.0	0.0	3.1	2.1	0.0	0.5	0.1	0.0
LnGrp Delay(d),s/veh	41.1	41.0	37.6	49.7	0.0	0.0	88.6	7.3	0.0	58.1	0.2	0.0
LnGrp LOS	D	D	D	D			F	F	A	E	A	A
Approach Vol, veh/h		315			202			2380			1506	
Approach Delay, s/veh		40.4			49.7			9.3			0.8	
Approach LOS		D			D			A			A	

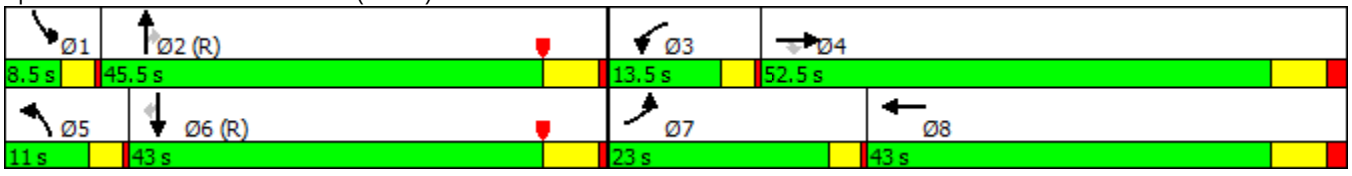
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	80.4		34.0	9.0	77.0		34.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	59.0		38.8	5.5	59.2		38.8
Max Q Clear Time (g_c+I1), s	3.2	2.0		13.2	7.5	2.0		24.9
Green Ext Time (p_c), s	0.0	49.8		2.6	0.0	50.0		2.2

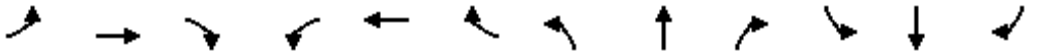
Intersection Summary	
HCM 2010 Ctrl Delay	10.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	312	234	195	29	51	131	2053	46	23	1401	137
Future Volume (vph)	312	234	195	29	51	131	2053	46	23	1401	137
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	27.4	27.4	10.0	14.9	18.0	65.7	65.7	5.7	50.0	50.0
Actuated g/C Ratio	0.16	0.23	0.23	0.08	0.12	0.15	0.55	0.55	0.05	0.42	0.42
v/c Ratio	1.23	0.59	0.40	0.22	0.30	0.56	1.13	0.05	0.32	1.01	0.20
Control Delay	174.3	45.9	6.4	55.8	38.7	39.3	88.4	3.4	75.9	49.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	174.3	45.9	6.4	55.8	38.7	39.3	88.4	3.4	75.9	49.8	4.5
LOS	F	D	A	E	D	D	F	A	E	D	A
Approach Delay		89.6			43.9		83.8			46.2	
Approach LOS		F			D		F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 71.2	Intersection LOS: E
Intersection Capacity Utilization 105.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	312	234	195	29	51	15	131	2053	46	23	1401	137
Future Volume (veh/h)	312	234	195	29	51	15	131	2053	46	23	1401	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	322	241	125	30	53	10	135	2116	38	24	1444	88
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	263	314	267	85	95	18	101	1995	893	37	1860	814
Arrive On Green	0.16	0.17	0.17	0.05	0.06	0.06	0.02	0.19	0.19	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1473	278	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	322	241	125	30	0	63	135	2116	38	24	1444	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1751	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	19.5	15.3	8.8	2.1	0.0	4.2	7.5	70.0	2.4	1.8	48.3	5.9
Cycle Q Clear(g_c), s	19.5	15.3	8.8	2.1	0.0	4.2	7.5	70.0	2.4	1.8	48.3	5.9
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	314	267	85	0	113	101	1995	893	37	1860	814
V/C Ratio(X)	1.22	0.77	0.47	0.35	0.00	0.56	1.33	1.06	0.04	0.65	0.78	0.11
Avail Cap(c_a), veh/h	263	683	580	135	0	525	101	1995	893	67	1860	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.62	0.62	0.62
Uniform Delay (d), s/veh	50.3	47.2	44.5	54.9	0.0	54.5	58.8	48.4	21.2	59.1	42.3	24.9
Incr Delay (d2), s/veh	129.8	3.0	1.0	0.9	0.0	3.2	156.5	28.6	0.0	4.3	2.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.2	7.9	3.8	1.0	0.0	2.1	7.8	41.1	1.0	0.8	23.4	2.5
LnGrp Delay(d),s/veh	180.0	50.2	45.5	55.8	0.0	57.6	215.3	77.1	21.2	63.4	44.3	25.0
LnGrp LOS	F	D	D	E		E	F	F	C	E	D	C
Approach Vol, veh/h		688			93			2289			1556	
Approach Delay, s/veh		110.1			57.0			84.3			43.5	
Approach LOS		F			E			F			D	

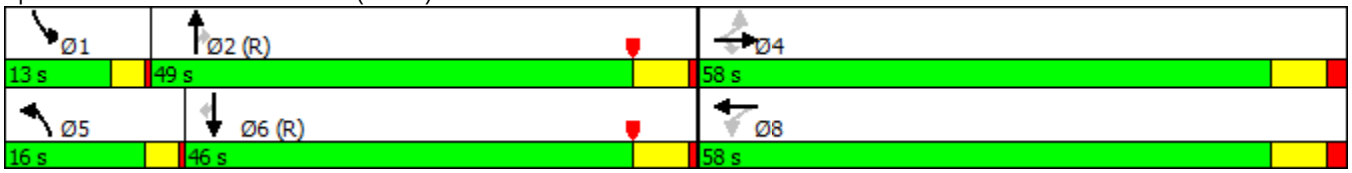
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	76.0	9.8	27.9	11.0	71.3	23.0	14.7
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	3.8	72.0	4.1	17.3	9.5	50.3	21.5	6.2
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	73.9
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	357	490	296	30	145	199	1807	84	71	1372	176
Future Volume (vph)	357	490	296	30	145	199	1807	84	71	1372	176
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	45.8	45.8	45.8	45.8	45.8	17.7	51.0	51.0	8.5	40.0	40.0
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.15	0.42	0.42	0.07	0.33	0.33
v/c Ratio	0.90	0.73	0.43	0.19	0.27	0.86	1.27	0.12	0.64	1.23	0.31
Control Delay	59.6	37.9	9.3	25.7	23.8	59.2	155.8	15.6	84.5	130.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.6	37.9	9.3	25.7	23.8	59.2	155.8	15.6	84.5	130.2	4.8
LOS	E	D	A	C	C	E	F	B	F	F	A
Approach Delay		37.3			24.1		141.0			114.5	
Approach LOS		D			C		F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 104.3	Intersection LOS: F
Intersection Capacity Utilization 109.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	357	490	296	30	145	31	199	1807	84	71	1372	176
Future Volume (veh/h)	357	490	296	30	145	31	199	1807	84	71	1372	176
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	364	500	210	31	148	27	203	1844	66	72	1400	153
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	455	732	613	186	603	110	169	1372	614	89	1203	538
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.03	0.13	0.13	0.11	0.70	0.70
Sat Flow, veh/h	1161	1800	1509	709	1482	270	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	364	500	210	31	0	175	203	1844	66	72	1400	153
Grp Sat Flow(s),veh/h/ln	1161	1800	1509	709	0	1752	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	36.2	27.4	11.5	4.5	0.0	7.9	12.5	48.1	4.6	5.2	42.2	4.4
Cycle Q Clear(g_c), s	44.1	27.4	11.5	31.9	0.0	7.9	12.5	48.1	4.6	5.2	42.2	4.4
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	455	732	613	186	0	712	169	1372	614	89	1203	538
V/C Ratio(X)	0.80	0.68	0.34	0.17	0.00	0.25	1.20	1.34	0.11	0.81	1.16	0.28
Avail Cap(c_a), veh/h	477	765	641	200	0	745	169	1372	614	128	1203	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.46	0.46	0.46	0.26	0.26	0.26
Uniform Delay (d), s/veh	38.0	29.3	24.5	42.4	0.0	23.5	57.9	52.1	33.2	52.8	17.8	12.2
Incr Delay (d2), s/veh	9.0	2.4	0.3	0.4	0.0	0.2	114.7	157.1	0.2	4.2	76.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	14.1	4.9	0.9	0.0	3.9	11.0	52.8	2.0	2.4	31.8	1.8
LnGrp Delay(d),s/veh	47.0	31.6	24.9	42.8	0.0	23.7	172.7	209.2	33.3	57.0	94.1	12.5
LnGrp LOS	D	C	C	D		C	F	F	C	E	F	B
Approach Vol, veh/h		1074			206			2113			1625	
Approach Delay, s/veh		35.5			26.5			200.2			84.8	
Approach LOS		D			C			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.1	54.1		55.8	16.0	48.2		55.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	7.2	50.1		46.1	14.5	44.2		33.9
Green Ext Time (p_c), s	0.0	0.0		2.7	0.0	0.0		6.0

Intersection Summary		
HCM 2010 Ctrl Delay		120.5
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	51	29	218	8	13	162	1969	18	11	1670	52
Future Volume (vph)	51	29	218	8	13	162	1969	18	11	1670	52
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	16.0	16.0	16.0	16.0	16.0	18.9	89.7	89.7	5.5	71.0	71.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.16	0.75	0.75	0.05	0.59	0.59
v/c Ratio	0.33	0.13	0.67	0.05	0.11	0.69	0.84	0.02	0.16	0.90	0.06
Control Delay	47.2	40.8	22.0	37.1	25.4	59.1	17.6	0.0	70.0	15.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	40.8	22.0	37.1	25.4	59.1	17.6	0.0	70.0	15.3	0.1
LOS	D	D	C	D	C	E	B	A	E	B	A
Approach Delay		28.1			28.5		20.6			15.1	
Approach LOS		C			C		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	29	218	8	13	10	162	1969	18	11	1670	52
Future Volume (veh/h)	51	29	218	8	13	10	162	1969	18	11	1670	52
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	55	32	132	9	14	9	176	2140	19	12	1815	57
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	185	192	163	166	109	70	175	2610	1168	22	2286	1000
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.76	0.76	0.03	1.00	1.00
Sat Flow, veh/h	1332	1800	1530	1172	1025	659	1619	3420	1530	1619	3420	1496
Grp Volume(v), veh/h	55	32	132	9	0	23	176	2140	19	12	1815	57
Grp Sat Flow(s),veh/h/ln	1332	1800	1530	1172	0	1684	1619	1710	1530	1619	1710	1496
Q Serve(g_s), s	4.7	1.9	10.1	0.8	0.0	1.5	13.0	47.5	0.4	0.9	0.0	0.0
Cycle Q Clear(g_c), s	6.2	1.9	10.1	2.8	0.0	1.5	13.0	47.5	0.4	0.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	185	192	163	166	0	179	175	2610	1168	22	2286	1000
V/C Ratio(X)	0.30	0.17	0.81	0.05	0.00	0.13	1.00	0.82	0.02	0.54	0.79	0.06
Avail Cap(c_a), veh/h	510	630	535	451	0	589	175	2610	1168	67	2286	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	51.4	48.8	52.4	50.0	0.0	48.6	53.5	9.0	3.4	58.0	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.3	7.0	0.1	0.0	0.2	68.9	3.0	0.0	1.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.0	4.6	0.3	0.0	0.7	9.2	23.1	0.2	0.4	0.1	0.0
LnGrp Delay(d),s/veh	52.0	49.1	59.4	50.1	0.0	48.8	122.4	12.0	3.4	59.3	0.3	0.0
LnGrp LOS	D	D	E	D		D	F	B	A	E	A	A
Approach Vol, veh/h		219			32			2335			1884	
Approach Delay, s/veh		56.0			49.2			20.3			0.6	
Approach LOS		E			D			C			A	

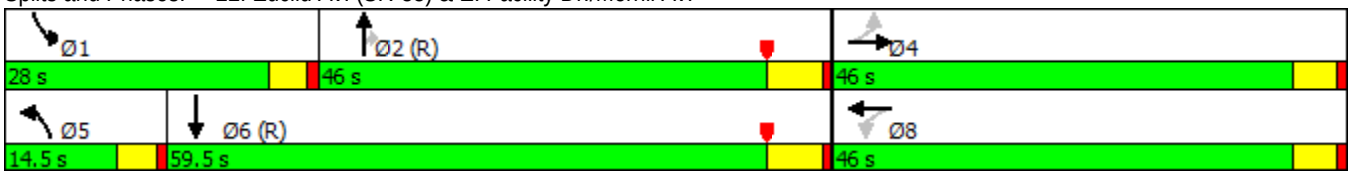
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	97.3		17.6	16.5	85.9		17.6
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	2.9	49.5		12.1	15.0	2.0		4.8
Green Ext Time (p_c), s	0.0	9.3		0.7	0.0	45.4		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	22	185	0	2	1737	356	698	1182
Future Volume (vph)	5	22	185	0	2	1737	356	698	1182
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	10.0	40.0	40.0	23.5	65.1
Actuated g/C Ratio		0.34		0.34	0.08	0.33	0.33	0.20	0.54
v/c Ratio		0.07		1.22	0.01	1.64	0.68	2.38	0.69
Control Delay		20.9		145.1	71.0	311.5	13.6	644.4	26.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.9		145.1	71.0	311.5	13.6	644.4	26.5
LOS		C		F	E	F	B	F	C
Approach Delay		20.9		145.1		260.6			255.9
Approach LOS		C		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.38	
Intersection Signal Delay: 240.8	Intersection LOS: F
Intersection Capacity Utilization 154.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	11	185	0	460	2	1737	356	698	1182	1
Future Volume (veh/h)	5	22	11	185	0	460	2	1737	356	698	1182	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	24	4	199	0	467	2	1868	354	751	1271	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	86	387	61	190	2	359	9	1140	499	317	1837	1
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.33	0.33	0.20	0.52	0.52
Sat Flow, veh/h	151	1133	177	443	5	1051	1619	3420	1496	1619	3507	3
Grp Volume(v), veh/h	33	0	0	666	0	0	2	1868	354	751	620	652
Grp Sat Flow(s),veh/h/ln	1461	0	0	1499	0	0	1619	1710	1496	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	39.5	0.0	0.0	0.1	40.0	24.8	23.5	32.5	32.5
Cycle Q Clear(g_c), s	1.5	0.0	0.0	41.0	0.0	0.0	0.1	40.0	24.8	23.5	32.5	32.5
Prop In Lane	0.15		0.12	0.30		0.70	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	534	0	0	551	0	0	9	1140	499	317	896	943
V/C Ratio(X)	0.06	0.00	0.00	1.21	0.00	0.00	0.23	1.64	0.71	2.37	0.69	0.69
Avail Cap(c_a), veh/h	534	0	0	551	0	0	135	1140	499	317	896	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	40.8	0.0	0.0	59.4	40.0	34.9	48.3	21.3	21.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	110.0	0.0	0.0	0.4	287.7	0.8	625.5	4.4	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	35.1	0.0	0.0	0.1	64.4	10.3	65.6	16.4	17.2
LnGrp Delay(d),s/veh	26.5	0.0	0.0	150.9	0.0	0.0	59.9	327.7	35.7	673.8	25.7	25.5
LnGrp LOS	C			F			E	F	D	F	C	C
Approach Vol, veh/h		33			666			2224			2023	
Approach Delay, s/veh		26.5			150.9			281.0			266.2	
Approach LOS		C			F			F			F	

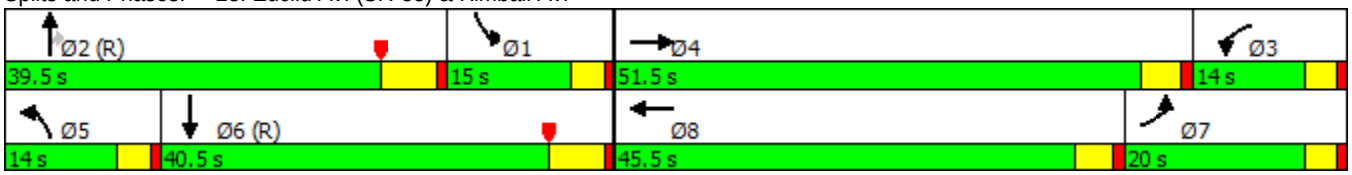
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.0	46.0		46.0	5.1	68.9		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	25.5	42.0		3.5	2.1	34.5		43.0
Green Ext Time (p_c), s	0.0	0.0		3.1	0.0	17.3		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		255.7	
HCM 2010 LOS		F	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	638	862	245	516	126	842	165	329	899
Future Volume (vph)	638	862	245	516	126	842	165	329	899
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	20.0	51.5	14.0	45.5	14.0	39.5	39.5	15.0	40.5
Total Split (%)	16.7%	42.9%	11.7%	37.9%	11.7%	32.9%	32.9%	12.5%	33.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	17.2	41.7	15.3	39.8	10.0	33.0	33.0	11.5	34.5
Actuated g/C Ratio	0.14	0.35	0.13	0.33	0.08	0.28	0.28	0.10	0.29
v/c Ratio	2.88	0.84	1.24	0.95	0.98	0.93	0.32	2.21	1.19
Control Delay	878.1	42.4	185.1	48.5	95.0	46.8	12.3	583.7	121.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	878.1	42.4	185.1	48.5	95.0	46.8	12.3	583.7	121.9
LOS	F	D	F	D	F	D	B	F	F
Approach Delay		379.4		73.8		47.1			228.1
Approach LOS		F		E		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.88	
Intersection Signal Delay: 197.1	Intersection LOS: F
Intersection Capacity Utilization 134.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	638	862	83	245	516	562	126	842	165	329	899	204
Future Volume (veh/h)	638	862	83	245	516	562	126	842	165	329	899	204
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	665	898	82	255	538	551	131	877	157	343	936	194
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	216	1025	94	246	584	523	135	944	422	868	2099	435
Arrive On Green	0.13	0.32	0.32	0.15	0.34	0.34	0.03	0.09	0.09	0.54	0.75	0.75
Sat Flow, veh/h	1619	3170	289	1619	1710	1530	1619	3420	1530	1619	2816	583
Grp Volume(v), veh/h	665	484	496	255	538	551	131	877	157	343	568	562
Grp Sat Flow(s),veh/h/ln	1619	1710	1749	1619	1710	1530	1619	1710	1530	1619	1710	1689
Q Serve(g_s), s	16.0	32.1	32.1	18.2	36.3	41.0	9.7	30.6	11.6	15.0	15.2	15.2
Cycle Q Clear(g_c), s	16.0	32.1	32.1	18.2	36.3	41.0	9.7	30.6	11.6	15.0	15.2	15.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	216	553	566	246	584	523	135	944	422	868	1275	1259
V/C Ratio(X)	3.08	0.88	0.88	1.04	0.92	1.05	0.97	0.93	0.37	0.40	0.45	0.45
Avail Cap(c_a), veh/h	216	670	685	246	584	523	135	955	427	868	1275	1259
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.31	0.31	0.31	1.00	1.00	1.00	0.32	0.32	0.32	0.67	0.67	0.67
Uniform Delay (d), s/veh	52.0	38.3	38.3	50.9	37.9	39.5	58.2	53.4	44.7	16.4	5.8	5.8
Incr Delay (d2), s/veh	940.0	3.8	3.7	67.9	19.7	54.4	36.2	6.7	0.8	0.1	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	63.5	15.7	16.0	12.7	20.2	25.2	5.7	15.4	5.0	6.7	7.4	7.3
LnGrp Delay(d),s/veh	992.0	42.1	42.0	118.8	57.7	93.9	94.4	60.0	45.6	16.4	6.6	6.6
LnGrp LOS	F	D	D	F	E	F	F	E	D	B	A	A
Approach Vol, veh/h		1645			1344			1165			1473	
Approach Delay, s/veh		426.1			84.1			62.0			8.9	
Approach LOS		F			F			E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	72.0	39.1	22.2	43.3	14.0	97.1	20.0	45.5
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	* 34	10.0	47.0	10.0	34.5	16.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	32.6	20.2	34.1	11.7	17.2	18.0	43.0
Green Ext Time (p_c), s	0.0	0.6	0.0	4.7	0.0	6.5	0.0	0.0

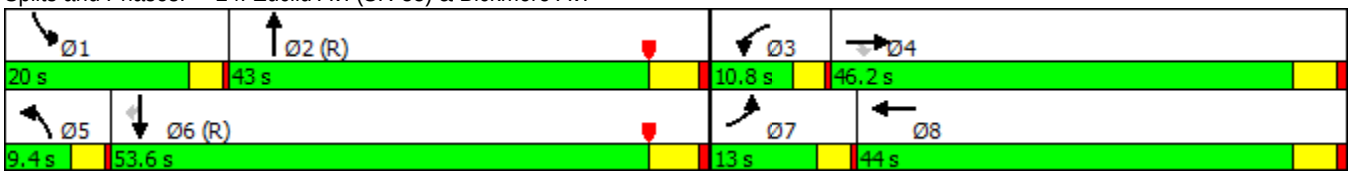
Intersection Summary	
HCM 2010 Ctrl Delay	159.8
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	117	122	120	223	43	48	890	222	887	79
Future Volume (vph)	117	122	120	223	43	48	890	222	887	79
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	46.2	46.2	10.8	44.0	9.4	43.0	20.0	53.6	53.6
Total Split (%)	10.8%	38.5%	38.5%	9.0%	36.7%	7.8%	35.8%	16.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.5	18.0	18.0	7.3	15.8	7.5	51.4	25.8	71.4	71.4
Actuated g/C Ratio	0.08	0.15	0.15	0.06	0.13	0.06	0.43	0.22	0.60	0.60
v/c Ratio	1.02	0.50	0.39	2.53	0.59	0.53	0.88	0.71	0.48	0.09
Control Delay	140.7	50.8	8.9	741.0	22.0	80.5	16.2	56.8	5.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	140.7	50.8	8.9	741.0	22.0	80.5	16.2	56.8	5.4	0.9
LOS	F	D	A	F	C	F	B	E	A	A
Approach Delay		66.1			427.3		18.8		14.7	
Approach LOS		E			F		B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.53	
Intersection Signal Delay: 74.4	Intersection LOS: E
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	122	120	223	43	130	48	890	245	222	887	79
Future Volume (veh/h)	117	122	120	223	43	130	48	890	245	222	887	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	130	136	114	248	48	132	53	989	262	247	986	88
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	128	280	238	98	58	160	66	1334	352	223	2043	895
Arrive On Green	0.08	0.16	0.16	0.06	0.14	0.14	0.05	0.67	0.67	0.28	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	425	1169	1619	2665	703	1619	3420	1498
Grp Volume(v), veh/h	130	136	114	248	0	180	53	633	618	247	986	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1594	1619	1710	1658	1619	1710	1498
Q Serve(g_s), s	9.5	8.3	8.2	7.3	0.0	13.2	3.9	29.3	29.6	16.5	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.3	8.2	7.3	0.0	13.2	3.9	29.3	29.6	16.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.73	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	128	280	238	98	0	218	66	856	830	223	2043	895
V/C Ratio(X)	1.01	0.49	0.48	2.52	0.00	0.82	0.81	0.74	0.74	1.11	0.48	0.10
Avail Cap(c_a), veh/h	128	618	525	98	0	518	80	856	830	223	2043	895
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.3	46.3	46.2	56.3	0.0	50.4	56.3	14.9	15.0	43.5	0.0	0.0
Incr Delay (d2), s/veh	83.3	0.5	0.6	712.2	0.0	3.0	3.8	0.5	0.6	55.8	0.1	0.0
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	4.2	3.5	22.7	0.0	6.0	1.8	13.7	13.4	10.7	0.0	0.0
LnGrp Delay(d),s/veh	138.7	46.8	46.8	768.5	0.0	53.3	60.0	15.5	15.5	99.3	0.1	0.0
LnGrp LOS	F	D	D	F		D	E	B	B	F	A	A
Approach Vol, veh/h		380			428			1304			1321	
Approach Delay, s/veh		78.2			467.7			17.3			18.6	
Approach LOS		E			F			B			B	

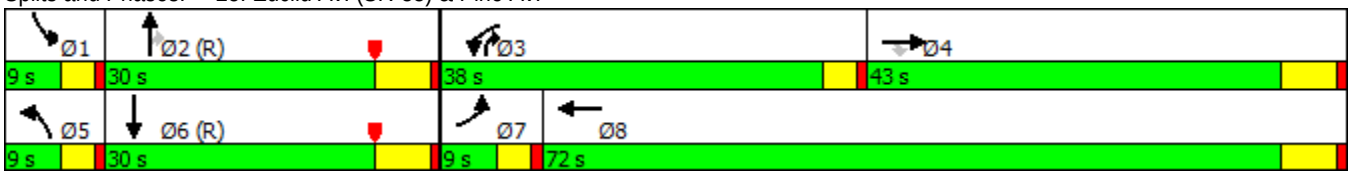
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	65.6	10.8	23.6	8.4	77.2	13.0	21.4
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	16.5	37.5	7.3	41.2	5.9	48.1	9.5	39.0
Max Q Clear Time (g_c+I1), s	18.5	31.6	9.3	10.3	5.9	2.0	11.5	15.2
Green Ext Time (p_c), s	0.0	4.1	0.0	1.3	0.0	12.2	0.0	1.3

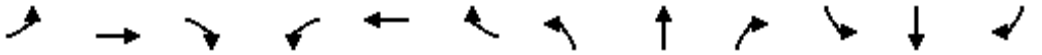
Intersection Summary	
HCM 2010 Ctrl Delay	80.7
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	353	30	494	80	35	1043	1117	144	1032
Future Volume (vph)	15	353	30	494	80	35	1043	1117	144	1032
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	30.1	30.1	34.0	64.5	6.2	24.0	64.0	11.9	31.6
Actuated g/C Ratio	0.04	0.25	0.25	0.28	0.54	0.05	0.20	0.53	0.10	0.26
v/c Ratio	0.22	0.81	0.06	0.61	0.17	0.44	1.57	1.26	0.93	1.20
Control Delay	63.7	56.0	0.3	41.0	8.7	67.5	290.5	140.6	82.4	129.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	56.0	0.3	41.0	8.7	67.5	290.5	140.6	82.4	129.2
LOS	E	E	A	D	A	E	F	F	F	F
Approach Delay		52.1			33.4		210.7			123.5
Approach LOS		D			C		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.57	
Intersection Signal Delay: 147.2	Intersection LOS: F
Intersection Capacity Utilization 113.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	353	30	494	80	71	35	1043	1117	144	1032	15
Future Volume (veh/h)	15	353	30	494	80	71	35	1043	1117	144	1032	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	364	0	509	82	67	36	1075	719	148	1064	11
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	424	360	566	377	308	47	1248	851	67	1308	14
Arrive On Green	0.02	0.24	0.00	0.19	0.41	0.41	0.03	0.36	0.36	0.01	0.12	0.12
Sat Flow, veh/h	1619	1800	1530	2956	918	750	1619	3420	1530	1619	3467	36
Grp Volume(v), veh/h	15	364	0	509	0	149	36	1075	719	148	525	550
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1668	1619	1710	1530	1619	1710	1793
Q Serve(g_s), s	1.1	23.3	0.0	20.2	0.0	6.9	2.6	34.9	43.8	5.0	35.9	35.9
Cycle Q Clear(g_c), s	1.1	23.3	0.0	20.2	0.0	6.9	2.6	34.9	43.8	5.0	35.9	35.9
Prop In Lane	1.00		1.00	1.00		0.45	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	27	424	360	566	0	685	47	1248	851	67	645	676
V/C Ratio(X)	0.57	0.86	0.00	0.90	0.00	0.22	0.76	0.86	0.84	2.19	0.81	0.81
Avail Cap(c_a), veh/h	67	555	472	838	0	917	67	1248	851	67	645	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.42	0.42	0.42
Uniform Delay (d), s/veh	58.6	44.0	0.0	47.4	0.0	22.9	57.8	35.3	22.3	59.2	48.4	48.4
Incr Delay (d2), s/veh	6.8	11.5	0.0	6.9	0.0	0.2	1.6	0.8	1.0	557.0	4.8	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.9	0.0	8.8	0.0	3.2	1.2	16.6	20.1	12.7	17.9	18.7
LnGrp Delay(d),s/veh	65.4	55.4	0.0	54.2	0.0	23.1	59.4	36.1	23.3	616.2	53.2	53.0
LnGrp LOS	E	E		D		C	E	D	C	F	D	D
Approach Vol, veh/h		379			658			1830			1223	
Approach Delay, s/veh		55.8			47.2			31.5			121.2	
Approach LOS		E			D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	49.8	27.0	34.2	7.5	51.3	6.0	55.3
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	45.8	22.2	25.3	4.6	37.9	3.1	8.9
Green Ext Time (p_c), s	0.0	0.0	0.8	3.0	0.0	0.0	0.0	4.7

Intersection Summary	
HCM 2010 Ctrl Delay	63.1
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	861	185	322	1284	159	1429
Future Volume (vph)	861	185	322	1284	159	1429
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	48.0	48.0	36.0	84.0	36.0	36.0
Total Split (%)	40.0%	40.0%	30.0%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	47.6	47.6	28.4	79.5	32.5	32.5
Actuated g/C Ratio	0.40	0.40	0.24	0.66	0.27	0.27
v/c Ratio	0.71	0.28	0.89	0.63	0.20	2.07
Control Delay	36.2	8.8	69.1	4.4	34.4	504.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	8.8	69.1	4.4	34.4	504.9
LOS	D	A	E	A	C	F
Approach Delay	31.4			17.4	457.7	
Approach LOS	C			B	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.07	
Intersection Signal Delay: 185.7	Intersection LOS: F
Intersection Capacity Utilization 125.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	861	185	322	1284	159	1429
Future Volume (veh/h)	861	185	322	1284	159	1429
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	957	0	358	1427	177	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2076	929	384	2942	243	112
Arrive On Green	0.81	0.00	0.22	0.86	0.07	0.00
Sat Flow, veh/h	3510	1530	1714	3510	3326	1530
Grp Volume(v), veh/h	957	0	358	1427	177	0
Grp Sat Flow(s),veh/h/ln	1710	1530	1714	1710	1663	1530
Q Serve(g_s), s	10.3	0.0	24.6	12.0	6.3	0.0
Cycle Q Clear(g_c), s	10.3	0.0	24.6	12.0	6.3	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2076	929	384	2942	243	112
V/C Ratio(X)	0.46	0.00	0.93	0.49	0.73	0.00
Avail Cap(c_a), veh/h	2076	929	464	2942	901	414
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.11	0.11	1.00	0.00
Uniform Delay (d), s/veh	5.5	0.0	45.7	2.0	54.4	0.0
Incr Delay (d2), s/veh	0.7	0.0	3.5	0.1	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	12.0	5.6	3.0	0.0
LnGrp Delay(d),s/veh	6.3	0.0	49.2	2.1	58.5	0.0
LnGrp LOS	A		D	A	E	
Approach Vol, veh/h	957			1785	177	
Approach Delay, s/veh	6.3			11.5	58.5	
Approach LOS	A			B	E	

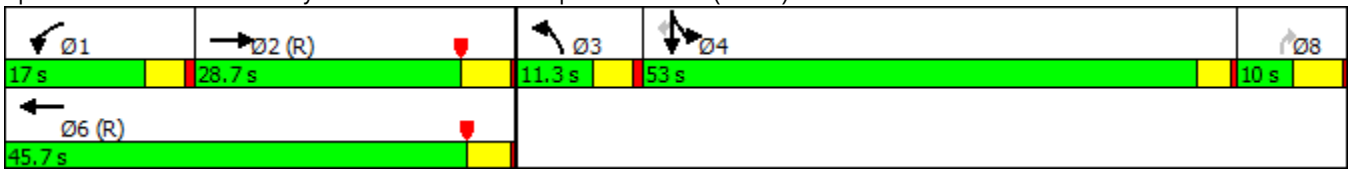
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	30.4	77.3				107.7		12.3
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	32.5	43.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	26.6	12.3				14.0		8.3
Green Ext Time (p_c), s	0.3	18.1				25.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	12.7
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	331	105	253	31	16	770	149	162
Future Volume (vph)	331	105	253	31	16	770	149	162
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.7	17.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.9%	14.2%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	35.5	11.7	52.1	6.5	5.0	43.1	43.1	43.1
Actuated g/C Ratio	0.30	0.10	0.43	0.05	0.04	0.36	0.36	0.36
v/c Ratio	0.39	0.69	0.18	0.37	0.08	0.85	0.81	0.25
Control Delay	37.4	73.4	10.9	66.7	0.9	50.2	45.5	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	73.4	10.9	66.7	0.9	50.2	45.5	4.3
LOS	D	E	B	E	A	D	D	A
Approach Delay	37.4		29.2				41.3	
Approach LOS	D		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 38.3	Intersection LOS: D
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	331	45	105	253	0	31	0	16	770	149	162
Future Volume (veh/h)	0	331	45	105	253	0	31	0	16	770	149	162
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	341	46	108	261	0	32	0	16	904	0	167
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1509	202	130	2106	0	0	0	0	1015	0	480
Arrive On Green	0.00	0.50	0.50	0.08	0.62	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3123	406	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	191	196	108	261	0		0.0		904	0	167
Grp Sat Flow(s),veh/h/ln	0	1710	1728	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	7.6	7.7	7.9	3.8	0.0				31.9	0.0	10.1
Cycle Q Clear(g_c), s	0.0	7.6	7.7	7.9	3.8	0.0				31.9	0.0	10.1
Prop In Lane	0.00		0.23	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	851	860	130	2106	0				1015	0	480
V/C Ratio(X)	0.00	0.22	0.23	0.83	0.12	0.00				0.89	0.00	0.35
Avail Cap(c_a), veh/h	0	851	860	169	2106	0				1336	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.0	17.1	54.3	9.6	0.0				39.2	0.0	31.7
Incr Delay (d2), s/veh	0.0	0.6	0.6	22.5	0.1	0.0				6.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.7	3.8	4.4	1.8	0.0				15.1	0.0	4.3
LnGrp Delay(d),s/veh	0.0	17.7	17.7	76.8	9.7	0.0				45.5	0.0	32.2
LnGrp LOS		B	B	E	A					D		C
Approach Vol, veh/h		387			369						1071	
Approach Delay, s/veh		17.7			29.4						43.4	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.2	64.7		41.1		78.9		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	12.5	23.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.9	9.7		33.9		5.8		
Green Ext Time (p_c), s	0.1	2.2		3.7		2.6		

Intersection Summary	
HCM 2010 Ctrl Delay	35.1
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	452	328	2	0	26
Future Vol, veh/h	0	452	328	2	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	491	357	2	0	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	358
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	691
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	691
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	691
HCM Lane V/C Ratio	-	-	-	0.041
HCM Control Delay (s)	-	-	-	10.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	452	309	1	0	20
Future Vol, veh/h	0	452	309	1	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	491	336	1	0	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	336
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	711
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	711
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	711
HCM Lane V/C Ratio	-	-	-	0.031
HCM Control Delay (s)	-	-	-	10.2
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1303	57	4	1180	204	15
Future Volume (vph)	1303	57	4	1180	204	15
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	80.0	80.0	5.0	81.8	20.3	20.3
Actuated g/C Ratio	0.71	0.71	0.04	0.72	0.18	0.18
v/c Ratio	1.11	0.06	0.06	0.99	0.77	0.06
Control Delay	82.8	3.6	56.2	39.7	62.3	16.4
Queue Delay	0.0	0.0	0.0	27.9	0.0	0.0
Total Delay	82.8	3.6	56.2	67.6	62.3	16.4
LOS	F	A	E	E	E	B
Approach Delay	79.5			67.6	59.2	
Approach LOS	E			E	E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.4	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 72.8	Intersection LOS: E
Intersection Capacity Utilization 94.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1303	57	4	1180	204	15
Future Volume (veh/h)	1303	57	4	1180	204	15
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1416	62	4	1283	222	16
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1241	1055	8	1327	254	240
Arrive On Green	0.69	0.69	0.01	0.74	0.16	0.16
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1416	62	4	1283	222	16
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	73.9	1.4	0.3	69.8	14.4	1.0
Cycle Q Clear(g_c), s	73.9	1.4	0.3	69.8	14.4	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1241	1055	8	1327	254	240
V/C Ratio(X)	1.14	0.06	0.47	0.97	0.87	0.07
Avail Cap(c_a), veh/h	1241	1055	76	1372	408	385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	5.4	53.2	12.9	44.1	38.5
Incr Delay (d2), s/veh	73.7	0.0	14.3	16.7	11.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	61.6	0.6	0.2	40.0	7.2	0.4
LnGrp Delay(d),s/veh	90.3	5.4	67.5	29.6	55.7	38.6
LnGrp LOS	F	A	E	C	E	D
Approach Vol, veh/h	1478			1287	238	
Approach Delay, s/veh	86.8			29.7	54.5	
Approach LOS	F			C	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.2	80.1				85.3		21.9
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.3	75.9				71.8		16.4
Green Ext Time (p_c), s	0.0	0.0				7.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	59.7
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	21	0	219	59	3
Future Vol, veh/h	0	21	0	219	59	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	23	0	238	64	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	66	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	1003	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	1003	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1003	-	-
HCM Lane V/C Ratio	-	0.023	-	-
HCM Control Delay (s)	-	8.7	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	58	161	1	16	63
Future Vol, veh/h	5	58	161	1	16	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	63	175	1	17	68

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	279	176	0	0	176	0
Stage 1	176	-	-	-	-	-
Stage 2	103	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	715	872	-	-	1412	-
Stage 1	859	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	706	872	-	-	1412	-
Mov Cap-2 Maneuver	725	-	-	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	858	1412	-
HCM Lane V/C Ratio	-	-	0.08	0.012	-
HCM Control Delay (s)	-	-	9.6	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	18	145	1	5	64
Future Vol, veh/h	5	18	145	1	5	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	20	158	1	5	70

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	238	158	0	0	159	0
Stage 1	158	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	755	893	-	-	1433	-
Stage 1	875	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	752	893	-	-	1433	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	944	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	859	1433	-
HCM Lane V/C Ratio	-	-	0.029	0.004	-
HCM Control Delay (s)	-	-	9.3	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	10	3	142	67	1
Future Vol, veh/h	5	10	3	142	67	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	11	3	154	73	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	234	73	74	0	-	0
Stage 1	73	-	-	-	-	-
Stage 2	161	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	759	995	1538	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	757	995	1538	-	-	-
Mov Cap-2 Maneuver	757	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1538	-	901	-	-
HCM Lane V/C Ratio	0.002	-	0.018	-	-
HCM Control Delay (s)	7.3	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	140	2	1	76
Future Vol, veh/h	5	5	140	2	1	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	5	152	2	1	83

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	238	153	0	0	154	0
Stage 1	153	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	755	898	-	-	1439	-
Stage 1	880	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	754	898	-	-	1439	-
Mov Cap-2 Maneuver	757	-	-	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	942	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	821	1439	-
HCM Lane V/C Ratio	-	-	0.013	0.001	-
HCM Control Delay (s)	-	-	9.4	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	10	9	111	73	8
Future Vol, veh/h	30	10	9	111	73	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	11	10	121	79	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	224	84	88	0	-	0
Stage 1	84	-	-	-	-	-
Stage 2	140	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	769	981	1520	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	764	981	1520	-	-	-
Mov Cap-2 Maneuver	764	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	886	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1520	-	809	-	-
HCM Lane V/C Ratio	0.006	-	0.054	-	-
HCM Control Delay (s)	7.4	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	10	3	84	76	7
Future Vol, veh/h	35	10	3	84	76	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	38	11	3	91	83	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	184	86	90	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	98	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	810	978	1518	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	808	978	1518	-	-	-
Mov Cap-2 Maneuver	796	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	929	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1518	-	830	-	-
HCM Lane V/C Ratio	0.002	-	0.059	-	-
HCM Control Delay (s)	7.4	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	10	3	57	77	9
Future Vol, veh/h	30	10	3	57	77	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	11	3	62	84	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	157	89	93	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	839	975	1514	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	837	975	1514	-	-	-
Mov Cap-2 Maneuver	815	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	958	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	850	-	-
HCM Lane V/C Ratio	0.002	-	0.051	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	8	2	50	84	3
Future Vol, veh/h	10	8	2	50	84	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	9	2	54	91	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	152	93	95	0	-	0
Stage 1	93	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	844	970	1512	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	843	970	1512	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1512	-	879	-	-
HCM Lane V/C Ratio	0.001	-	0.022	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	35	14	34	87	5
Future Vol, veh/h	18	35	14	34	87	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	20	38	15	37	95	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	164	97	100	0	-	0
Stage 1	97	-	-	-	-	-
Stage 2	67	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	831	965	1505	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	961	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	823	965	1505	-	-	-
Mov Cap-2 Maneuver	805	-	-	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1505	-	904	-	-
HCM Lane V/C Ratio	0.01	-	0.064	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	9	38	119	3
Future Vol, veh/h	10	10	9	38	119	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	11	10	41	129	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	192	131	133	0	-	0
Stage 1	131	-	-	-	-	-
Stage 2	61	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	801	924	1464	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	967	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	795	924	1464	-	-	-
Mov Cap-2 Maneuver	784	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	960	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1464	-	848	-	-
HCM Lane V/C Ratio	0.007	-	0.026	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	410	212	6	30	99
Future Vol, veh/h	42	410	212	6	30	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	46	446	230	7	33	108

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	230	0	-	0	767	230
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	537	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1350	-	-	-	373	814
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	590	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1350	-	-	-	360	814
Mov Cap-2 Maneuver	-	-	-	-	515	-
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	570	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1350	-	-	-	515	814
HCM Lane V/C Ratio	0.034	-	-	-	0.063	0.132
HCM Control Delay (s)	7.8	-	-	-	12.5	10.1
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1311	7	0	1184	0	25
Future Vol, veh/h	1311	7	0	1184	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1425	8	0	1287	0	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	713
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	379
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	379
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.2
HCM LOS			C

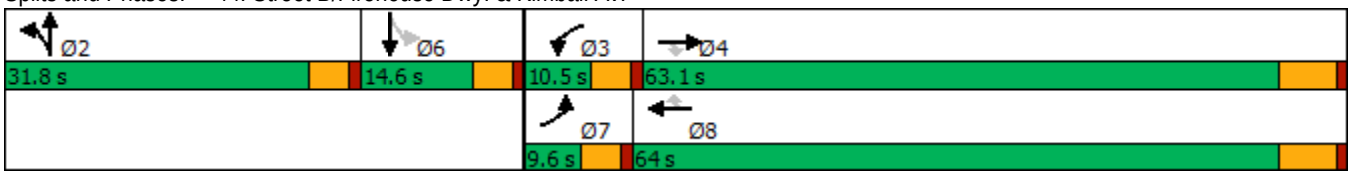
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	379	-	-	-
HCM Lane V/C Ratio	0.072	-	-	-
HCM Control Delay (s)	15.2	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBT	EBR	WBL	WBT	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	1265	71	21	893	0		
Future Volume (vph)	1265	71	21	893	0		
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		3	8	2	6	7
Permitted Phases		4					
Detector Phase	4	4	3	8	2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	23.2	23.2	9.6	16.2	31.6	14.6	9.6
Total Split (s)	63.1	63.1	10.5	64.0	31.8	14.6	9.6
Total Split (%)	52.6%	52.6%	8.8%	53.3%	26.5%	12%	8%
Yellow Time (s)	5.2	5.2	3.6	5.2	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.2	6.2	4.6	6.2	4.6		
Lead/Lag	Lag	Lag	Lead	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	Min	Min	None
Act Effct Green (s)	57.6	57.6	5.5	61.4	18.7		
Actuated g/C Ratio	0.54	0.54	0.05	0.58	0.18		
v/c Ratio	0.68	0.07	0.25	0.90	0.81		
Control Delay	21.6	2.0	59.1	33.7	43.6		
Queue Delay	0.1	0.0	0.0	0.0	0.0		
Total Delay	21.7	2.0	59.1	33.7	43.6		
LOS	C	A	E	C	D		
Approach Delay	20.6			34.3	43.6		
Approach LOS	C			C	D		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 105.7
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 28.3 — Intersection LOS: C
Intersection Capacity Utilization 77.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1265	71	21	893	0	290	0	28	0	0	0
Future Volume (veh/h)	0	1265	71	21	893	0	290	0	28	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	1332	75	22	940	0	305	0	29	0	0	0
Adj No. of Lanes	1	2	1	1	1	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	2	1798	764	41	1070	909	375	0	36	0	3	0
Arrive On Green	0.00	0.50	0.50	0.03	0.59	0.00	0.24	0.00	0.24	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	1800	1530	1549	0	147	0	1800	0
Grp Volume(v), veh/h	0	1332	75	22	940	0	334	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1697	0	0	0	1800	0
Q Serve(g_s), s	0.0	19.4	1.7	0.9	29.3	0.0	12.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	19.4	1.7	0.9	29.3	0.0	12.3	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.91		0.09	0.00		0.00
Lane Grp Cap(c), veh/h	2	1798	764	41	1070	909	411	0	0	0	3	0
V/C Ratio(X)	0.00	0.74	0.10	0.54	0.88	0.00	0.81	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	123	3100	1318	145	1575	1338	698	0	0	0	272	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	13.1	8.7	31.8	11.4	0.0	23.6	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.1	4.1	4.2	0.0	3.9	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.6	0.7	0.4	15.6	0.0	6.2	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.7	8.8	35.9	15.5	0.0	27.5	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		B	A	D	B		C					
Approach Vol, veh/h		1407			962			334			0	
Approach Delay, s/veh		13.5			16.0			27.5			0.0	
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		20.6	6.3	39.2		0.0	0.0	45.5
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		27.2	5.9	56.9		10.0	5.0	57.8
Max Q Clear Time (g_c+I1), s		14.3	2.9	21.4		0.0	0.0	31.3
Green Ext Time (p_c), s		1.7	0.0	11.6		0.0	0.0	7.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	46	0	0	0	0	36	0	237	0	12	67	13
Future Vol, veh/h	46	0	0	0	0	36	0	237	0	12	67	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	50	0	0	0	0	39	0	258	0	13	73	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	383	364	80	364	371	258	87	0	0	258	0	0
Stage 1	106	106	-	258	258	-	-	-	-	-	-	-
Stage 2	277	258	-	106	113	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	579	567	986	596	562	786	1522	-	-	1318	-	-
Stage 1	905	811	-	751	698	-	-	-	-	-	-	-
Stage 2	734	698	-	905	806	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	546	561	986	591	556	786	1522	-	-	1318	-	-
Mov Cap-2 Maneuver	546	561	-	591	556	-	-	-	-	-	-	-
Stage 1	905	803	-	751	698	-	-	-	-	-	-	-
Stage 2	697	698	-	896	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	9.8	0	1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1522	-	-	546	786	1318	-	-
HCM Lane V/C Ratio	-	-	-	0.092	0.05	0.01	-	-
HCM Control Delay (s)	0	-	-	12.3	9.8	7.8	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	0	0	232	66	1
Future Vol, veh/h	5	0	0	232	66	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	0	252	72	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	324	72	73	0	-	0
Stage 1	72	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	674	996	1540	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	674	996	1540	-	-	-
Mov Cap-2 Maneuver	674	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	795	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1540	-	674	-	-
HCM Lane V/C Ratio	-	-	0.008	-	-
HCM Control Delay (s)	0	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	146	86	0	41	25
Future Vol, veh/h	0	146	86	0	41	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	159	93	0	45	27

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	209	93	0	0	93	0
Stage 1	93	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	7.1	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	753	970	-	-	1514	-
Stage 1	919	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	736	970	-	-	1514	-
Mov Cap-2 Maneuver	736	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	867	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	970	1514	-
HCM Lane V/C Ratio	-	-	0.164	0.029	-
HCM Control Delay (s)	-	-	9.4	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1288	4	0	915	0	20
Future Vol, veh/h	1288	4	0	915	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1400	4	0	995	0	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	700
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	386
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	386
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	386	-	-	-
HCM Lane V/C Ratio	0.056	-	-	-
HCM Control Delay (s)	14.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1228	92	27	859	38	20
Future Vol, veh/h	1228	92	27	859	38	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1320	99	29	924	41	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1419	0	2352	710
Stage 1	-	-	-	-	1370	-
Stage 2	-	-	-	-	982	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	486	-	~ 35	381
Stage 1	-	-	-	-	205	-
Stage 2	-	-	-	-	366	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	486	-	~ 33	381
Mov Cap-2 Maneuver	-	-	-	-	168	-
Stage 1	-	-	-	-	205	-
Stage 2	-	-	-	-	344	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	26.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	168	381	-	-	486	-
HCM Lane V/C Ratio	0.243	0.056	-	-	0.06	-
HCM Control Delay (s)	33.2	15	-	-	12.9	-
HCM Lane LOS	D	C	-	-	B	-
HCM 95th %tile Q(veh)	0.9	0.2	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1110	39	803	83	23
Future Volume (vph)	1110	39	803	83	23
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	25.4	5.2	28.7	10.4	10.4
Actuated g/C Ratio	0.50	0.10	0.57	0.21	0.21
v/c Ratio	0.78	0.25	0.83	0.26	0.07
Control Delay	14.8	28.6	16.8	22.7	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	28.6	16.8	22.7	10.8
LOS	B	C	B	C	B
Approach Delay	14.8		17.3	20.1	
Approach LOS	B		B	C	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 50.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 62.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1110	139	39	803	83	23
Future Volume (veh/h)	1110	139	39	803	83	23
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1168	146	41	845	87	22
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1489	185	68	1104	295	279
Arrive On Green	0.49	0.49	0.04	0.61	0.18	0.18
Sat Flow, veh/h	3140	380	1619	1800	1619	1530
Grp Volume(v), veh/h	653	661	41	845	87	22
Grp Sat Flow(s),veh/h/ln	1710	1720	1619	1800	1619	1530
Q Serve(g_s), s	17.5	17.7	1.4	18.9	2.6	0.7
Cycle Q Clear(g_c), s	17.5	17.7	1.4	18.9	2.6	0.7
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	835	839	68	1104	295	279
V/C Ratio(X)	0.78	0.79	0.60	0.77	0.29	0.08
Avail Cap(c_a), veh/h	893	898	149	1255	295	279
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	11.8	26.0	7.8	19.5	18.8
Incr Delay (d2), s/veh	4.3	4.4	3.1	2.5	2.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	9.3	0.7	9.9	1.3	0.3
LnGrp Delay(d),s/veh	16.1	16.2	29.2	10.3	22.1	19.3
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	1314			886	109	
Approach Delay, s/veh	16.1			11.2	21.5	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.9	33.2				40.2		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	3.4	19.7				20.9		4.6
Green Ext Time (p_c), s	0.0	7.3				12.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1035	48	760	82	32
Future Volume (vph)	1035	48	760	82	32
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	24.6	5.7	30.1	10.4	10.4
Actuated g/C Ratio	0.47	0.11	0.58	0.20	0.20
v/c Ratio	0.79	0.29	0.78	0.27	0.11
Control Delay	16.4	29.5	13.8	23.9	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	29.5	13.8	23.9	16.2
LOS	B	C	B	C	B
Approach Delay	16.4		14.7	21.7	
Approach LOS	B		B	C	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 51.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1035	135	48	760	82	32
Future Volume (veh/h)	1035	135	48	760	82	32
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1113	145	52	817	88	28
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1464	190	81	1111	298	282
Arrive On Green	0.48	0.48	0.05	0.62	0.18	0.18
Sat Flow, veh/h	3125	395	1619	1800	1619	1530
Grp Volume(v), veh/h	626	632	52	817	88	28
Grp Sat Flow(s),veh/h/ln	1710	1719	1619	1800	1619	1530
Q Serve(g_s), s	16.2	16.3	1.7	17.3	2.5	0.8
Cycle Q Clear(g_c), s	16.2	16.3	1.7	17.3	2.5	0.8
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	825	829	81	1111	298	282
V/C Ratio(X)	0.76	0.76	0.64	0.74	0.30	0.10
Avail Cap(c_a), veh/h	903	908	176	1299	298	282
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.5	25.3	7.3	19.1	18.4
Incr Delay (d2), s/veh	3.5	3.5	3.1	1.9	2.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	8.5	0.8	9.0	1.3	0.4
LnGrp Delay(d),s/veh	14.9	15.0	28.5	9.1	21.6	19.1
LnGrp LOS	B	B	C	A	C	B
Approach Vol, veh/h	1258			869	116	
Approach Delay, s/veh	15.0			10.3	21.0	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.3	32.4				39.7		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	3.7	18.3				19.3		4.5
Green Ext Time (p_c), s	0.0	7.9				12.9		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	66.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	306	713	47	14	425	89	26	6	10	76	18	359
Future Vol, veh/h	306	713	47	14	425	89	26	6	10	76	18	359
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	326	759	50	15	452	95	28	6	11	81	19	382

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	547	0	0	813	0	0	2169	2016	408	1563	1993	499
Stage 1	-	-	-	-	-	-	1439	1439	-	529	529	-
Stage 2	-	-	-	-	-	-	730	577	-	1034	1464	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1033	-	-	823	-	-	30	59	598	84	61	576
Stage 1	-	-	-	-	-	-	142	200	-	537	530	-
Stage 2	-	-	-	-	-	-	417	505	-	252	195	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1033	-	-	823	-	-	~ 6	39	596	~ 58	41	576
Mov Cap-2 Maneuver	-	-	-	-	-	-	159	86	-	116	98	-
Stage 1	-	-	-	-	-	-	97	136	-	368	520	-
Stage 2	-	-	-	-	-	-	133	496	-	161	133	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.9	0.3	34	295.3
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	168	1033	-	-	823	-	-	310
HCM Lane V/C Ratio	0.266	0.315	-	-	0.018	-	-	1.555
HCM Control Delay (s)	34	10.1	-	-	9.5	-	-	295.3
HCM Lane LOS	D	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1	1.4	-	-	0.1	-	-	28

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	726	43	19	431	2	25	0	12	11	0	71
Future Vol, veh/h	30	726	43	19	431	2	25	0	12	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	825	49	22	490	2	28	0	14	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	492	0	0	874	0	0	1488	1450	437	1012	1473	491
Stage 1	-	-	-	-	-	-	915	915	-	534	534	-
Stage 2	-	-	-	-	-	-	573	535	-	478	939	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1082	-	-	781	-	-	95	132	573	208	128	582
Stage 1	-	-	-	-	-	-	298	354	-	534	528	-
Stage 2	-	-	-	-	-	-	508	527	-	543	345	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1082	-	-	781	-	-	79	124	573	194	121	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	232	286	-	194	121	-
Stage 1	-	-	-	-	-	-	289	343	-	518	513	-
Stage 2	-	-	-	-	-	-	428	512	-	514	334	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	19.7	14.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	287	1082	-	-	781	-	-	459
HCM Lane V/C Ratio	0.146	0.03	-	-	0.028	-	-	0.194
HCM Control Delay (s)	19.7	8.4	-	-	9.7	-	-	14.7
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	0.7

Intersection	
Intersection Delay, s/veh	27.3
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	351	0	398	0	0	0	0	0	200	159	0
Future Vol, veh/h	0	351	0	398	0	0	0	0	0	200	159	0
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	377	0	428	0	0	0	0	0	215	171	0
Number of Lanes	0	1	0	1	0	0	0	0	0	1	1	0

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	2
Conflicting Approach Right	NB	
Conflicting Lanes Right	2	0
HCM Control Delay	33.7	17.7
HCM LOS	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	200	159	351	398	334	204
LT Vol	200	0	351	0	0	0
Through Vol	0	159	0	0	334	0
RT Vol	0	0	0	398	0	204
Lane Flow Rate	215	171	377	428	359	219
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.504	0.376	0.825	0.79	0.764	0.423
Departure Headway (Hd)	8.438	7.922	7.867	6.642	7.657	6.936
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	428	455	464	548	474	520
Service Time	6.181	5.664	5.567	4.342	5.393	4.672
HCM Lane V/C Ratio	0.502	0.376	0.813	0.781	0.757	0.421
HCM Control Delay	19.5	15.4	38.1	29.9	31.2	14.7
HCM Lane LOS	C	C	E	D	D	B
HCM 95th-tile Q	2.8	1.7	7.9	7.4	6.6	2.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	334	204
Future Vol, veh/h	0	0	334	204
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	359	219
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	24.9
HCM LOS	C

APPENDIX 8.3:

OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

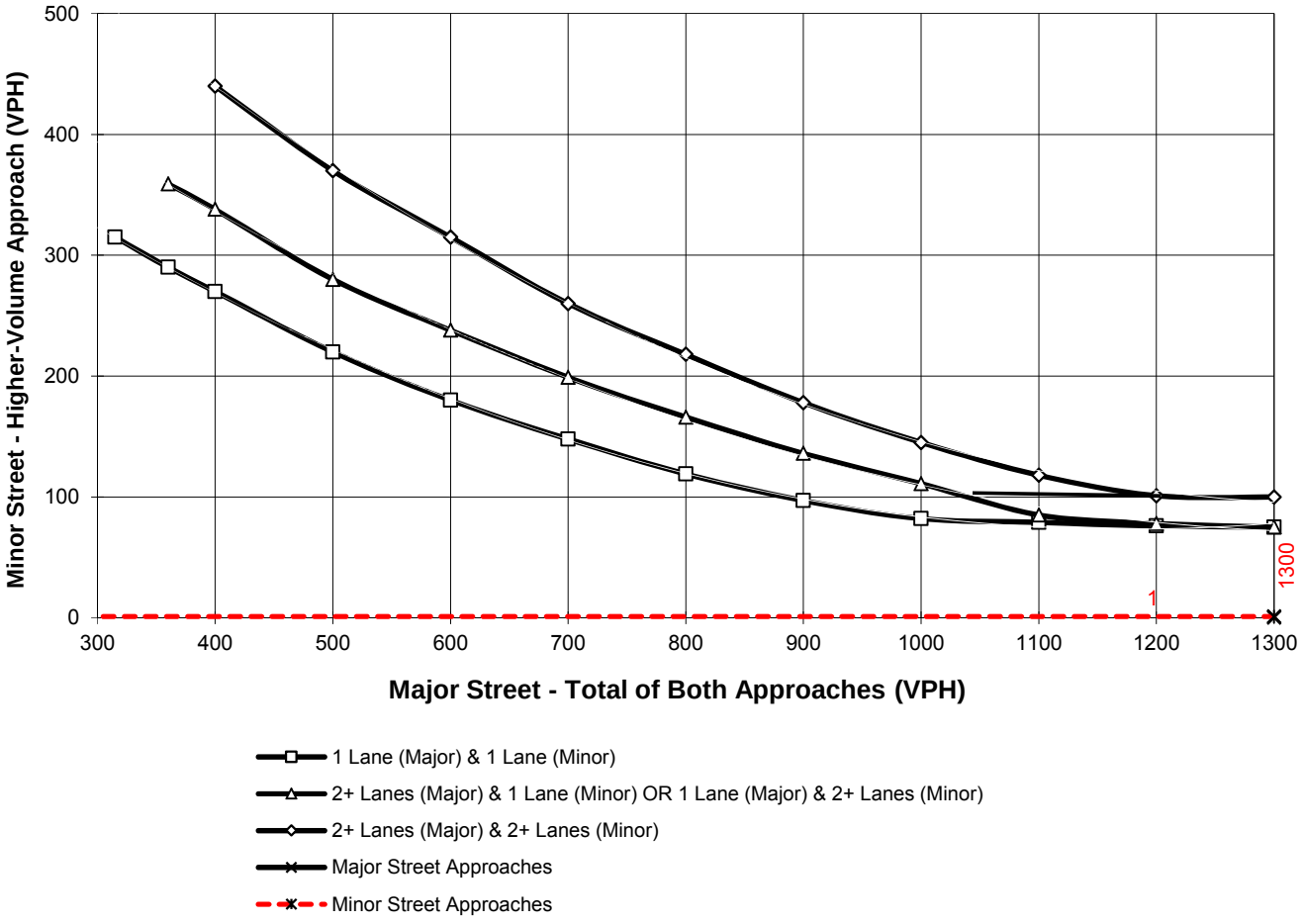
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **2020 Without Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.**
Total of Both Approaches (VPH) = **2369**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Fire Station Dwy.**
High Volume Approach (VPH) = **1**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 8.4:

OPENING YEAR CUMULATIVE (2020) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2020 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 4				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,382** vpd Minor Street Future ADT = **373** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,382**	1 **373**	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,382**	1 **373**	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A / B				
	16% / 20%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM				
				TRAFFIC CONDITIONS		**2020 WP**	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	09/06/16
Major Street:	**Mayhew Av.**			Critical Approach Speed (Major)		35	mph
Minor Street:	**Driveway 5**			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,992** vpd

Minor Street Future ADT = **136** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,992**	*1* **136**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,992**	*1* **136**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 6% **B** 11%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2020 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 6				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,949** vpd

Minor Street Future ADT = **93** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,949**	*1* **93**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,949**	*1* **93**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		**2020 WP**
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 7**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,980** vpd Minor Street Future ADT = **63** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,980**	*1* **63**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,980**	*1* **63**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 3% **B** 5%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2020 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 8				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,923** vpd Minor Street Future ADT = **301** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,923**	*1* **301**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,923**	*1* **301**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 13% **B** 16%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2020 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 9				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,744** vpd Minor Street Future ADT = **243** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied: XX / XX				
Number of lanes for moving traffic on each approach				
Major Street: 1 **1,744** / Minor Street: 1 **243**	8,000	5,600	2,400	1,680
2 + / 1	9,600	6,720	2,400	1,680
2 + / 2 +	9,600	6,720	3,200	2,240
1 / 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street: 1 **1,744** / Minor Street: 1 **243**	12,000	8,400	1,200	850
2 + / 1	14,400	10,080	1,200	850
2 + / 2 +	14,400	10,080	1,600	1,120
1 / 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 10% / B: 15%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2020 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 10				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,498** vpd Minor Street Future ADT = **245** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,498**	*1* **245**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,498**	*1* **245**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 10% **B** 12%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2020 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 11				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,360** vpd

Minor Street Future ADT = **107** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,360**	*1* **107**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,360**	*1* **107**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 9%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM				
___	___	___	___	TRAFFIC CONDITIONS			**2020 WP**
				CALC	CHS	DATE	09/06/16
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	09/06/16
Major Street:	**Mayhew Av.**			Critical Approach Speed (Major)			35 mph
Minor Street:	**Driveway 12**			Critical Approach Speed (Minor)			15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,497** vpd

Minor Street Future ADT = **362** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,497**	*1* **362**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,497**	*1* **362**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 15% **B** 12%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2020 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 13**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,623** vpd Minor Street Future ADT = **93** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …… [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,623**	*1* **93**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,623**	*1* **93**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		**2020 WP**
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Bickmore Av.**				Critical Approach Speed (Major)		40 mph
Minor Street: **Mayhew Av.**				Critical Approach Speed (Minor)		35 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **8,676** vpd Minor Street Future ADT = **793** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **RURAL (R)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **8,676**	*1* **793**	8,000 *	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **8,676**	*1* **793**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 33%	**B** 66%			

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2020 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Street B**				Critical Approach Speed (Major)		25 mph
Minor Street: **Driveway 15**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **3,361** vpd Minor Street Future ADT = **277** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
XX	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **3,361** / 1 **277**	8,000	5,600	2,400	1,680
2 + / 1	9,600	6,720	2,400	1,680
2 + / 2 +	9,600	6,720	3,200	2,240
1 / 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **3,361** / 1 **277**	12,000	8,400	1,200	850
2 + / 1	14,400	10,080	1,200	850
2 + / 2 +	14,400	10,080	1,600	1,120
1 / 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 12% B: 23%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2020 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Street B				Critical Approach Speed (Major)		25 mph
Minor Street: Driveway 16				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,820** vpd Minor Street Future ADT = **30** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,820**	*1* **30**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,820**	*1* **30**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 1% **B** 3%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2020 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Street B/Driveway 17				Critical Approach Speed (Major)		25 mph
Minor Street:	Driveway 18				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **2,574** vpd

Minor Street Future ADT = **216** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,574**	*1* **216**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,574**	*1* **216**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..		2 CONDITIONS 80%		2 CONDITIONS 80%	
A	**B**				
9%	**18%**				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 8.5:

OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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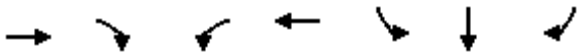


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1306	340	6	1033	317	320	428
v/c Ratio	0.44	0.38	0.04	0.59	0.62	0.58	0.73
Control Delay	11.8	3.2	27.7	9.7	23.2	21.7	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	3.2	27.7	9.7	23.2	21.7	21.6
Queue Length 50th (ft)	78	0	3	108	100	98	95
Queue Length 95th (ft)	144	47	m4	m118	178	174	#224
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	895	134	1738	511	550	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.38	0.04	0.59	0.62	0.58	0.73

Intersection Summary

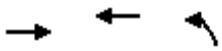
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	612	1280	649	369	210	430
v/c Ratio	1.13	0.55	0.46	0.53	1.23	1.15
Control Delay	108.2	6.1	14.3	11.1	173.0	122.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.2	6.1	14.3	11.1	173.0	122.8
Queue Length 50th (ft)	~144	68	86	54	~106	~103
Queue Length 95th (ft)	#231	165	127	123	#230	#190
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2308	1396	700	171	374
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.55	0.46	0.53	1.23	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

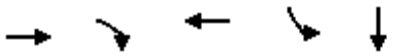
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2461	1099	600
v/c Ratio	0.91dr	0.35	1.21dr
Control Delay	9.9	8.6	38.1
Queue Delay	0.0	0.0	0.0
Total Delay	9.9	8.6	38.1
Queue Length 50th (ft)	184	96	159
Queue Length 95th (ft)	236	132	178
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3037	3130	1163
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.81	0.35	0.52

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1822	95	1286	643	593
v/c Ratio	0.81	0.13	0.58	0.93	0.85
Control Delay	25.2	3.9	13.2	44.2	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	3.9	13.2	44.2	32.8
Queue Length 50th (ft)	330	0	99	332	269
Queue Length 95th (ft)	321	19	101	405	334
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2251	734	2230	731	734
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.81	0.13	0.58	0.88	0.81

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	431	427	381	500	1076	1155	537
v/c Ratio	1.10	1.07	0.84	1.36	0.50	0.96	0.63
Control Delay	108.9	99.0	41.4	193.8	22.1	48.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	3.2	2.6	0.0
Total Delay	108.9	99.0	41.4	193.8	25.3	51.3	5.7
Queue Length 50th (ft)	~295	~296	158	~380	323	334	0
Queue Length 95th (ft)	#485	#498	#326	m#411	m326	#477	72
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	451	367	2147	1197	857
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	21	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	1.07	0.84	1.36	0.89	0.98	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	336	699	1186	702	331	1617
v/c Ratio	0.82	1.56	0.99	0.74	0.92	0.77
Control Delay	49.3	287.8	55.9	8.4	44.0	5.7
Queue Delay	12.7	1.3	0.0	0.0	0.0	4.4
Total Delay	62.0	289.1	55.9	8.4	44.0	10.1
Queue Length 50th (ft)	188	~566	~381	16	154	89
Queue Length 95th (ft)	#338	#795	#510	133	m154	m88
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	448	1192	947	376	2109
Starvation Cap Reductn	0	0	0	0	0	414
Spillback Cap Reductn	59	56	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.78	0.99	0.74	0.88	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	581	325	640	1302	78	981
v/c Ratio	0.56	0.47	1.14	0.57	0.09	1.14
Control Delay	59.5	24.9	104.6	0.9	33.1	95.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	24.9	104.6	0.9	33.1	95.3
Queue Length 50th (ft)	244	111	~576	7	23	~524
Queue Length 95th (ft)	m258	m117	m#540	m7	43	#780
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1040	691	562	2265	898	857
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.47	1.14	0.57	0.09	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

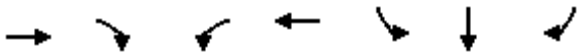
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	935	453	276	70	343	167	167	41
v/c Ratio	1.08	0.96	0.14	0.95	0.82	0.68	0.64	0.11
Control Delay	96.1	74.9	3.7	147.9	22.8	61.0	57.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.1	74.9	3.7	147.9	22.8	61.0	57.5	0.6
Queue Length 50th (ft)	~425	335	12	55	0	130	129	0
Queue Length 95th (ft)	#558	#645	17	#152	#146	190	187	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	868	471	2010	74	416	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.96	0.14	0.95	0.82	0.45	0.42	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1268	753	19	1045	351	363	759
v/c Ratio	0.43	0.78	0.14	0.60	0.69	0.65	1.29
Control Delay	11.7	13.2	37.6	9.5	25.9	23.4	164.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	13.2	37.6	9.5	25.9	23.4	164.0
Queue Length 50th (ft)	75	54	8	82	112	114	~334
Queue Length 95th (ft)	139	#320	m13	m103	#225	201	#527
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	970	134	1738	511	562	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.78	0.14	0.60	0.69	0.65	1.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

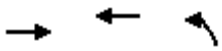
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	459	1302	695	645	197	320
v/c Ratio	0.85	0.61	0.57	0.94	0.80	0.60
Control Delay	40.3	9.7	17.7	37.7	51.6	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	9.7	17.7	37.7	51.6	28.4
Queue Length 50th (ft)	80	63	103	148	76	59
Queue Length 95th (ft)	#159	307	151	#356	#184	97
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1225	686	245	530
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.61	0.57	0.94	0.80	0.60

Intersection Summary

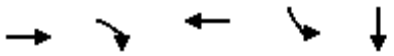
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1821	977	547
v/c Ratio	0.54	0.28	1.07dr
Control Delay	5.9	7.2	52.3
Queue Delay	0.0	0.0	0.0
Total Delay	5.9	7.2	52.3
Queue Length 50th (ft)	135	90	194
Queue Length 95th (ft)	221	135	241
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3383	3469	999
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.54	0.28	0.55

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	752	92	1104	895	921
v/c Ratio	0.59	0.20	0.86	0.87	0.92
Control Delay	41.3	8.2	45.4	26.1	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	8.2	45.4	26.1	32.5
Queue Length 50th (ft)	188	0	281	511	568
Queue Length 95th (ft)	233	41	#341	#806	#965
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1273	455	1285	1041	1007
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.20	0.86	0.86	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	397	389	359	561	1152	1015	589
v/c Ratio	0.93	0.90	0.78	1.60	0.56	0.88	0.66
Control Delay	62.9	55.1	35.8	297.1	23.0	38.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	4.2	0.0	0.0
Total Delay	62.9	55.1	35.8	297.1	27.1	38.1	6.2
Queue Length 50th (ft)	227	219	149	~479	358	282	0
Queue Length 95th (ft)	#405	#400	#291	m#468	m333	#397	79
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	450	475	350	2072	1159	886
Starvation Cap Reductn	0	0	0	0	822	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.86	0.76	1.60	0.92	0.88	0.66

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	367	613	1254	786	326	1323
v/c Ratio	0.86	1.37	1.08	0.84	0.91	0.64
Control Delay	52.4	206.6	82.8	14.4	52.6	5.4
Queue Delay	46.2	2.0	0.0	0.0	0.0	1.1
Total Delay	98.6	208.6	82.8	14.4	52.6	6.5
Queue Length 50th (ft)	208	~466	~436	49	136	63
Queue Length 95th (ft)	#372	#686	#565	#323	m184	m87
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	448	1157	940	376	2071
Starvation Cap Reductn	0	0	0	0	0	466
Spillback Cap Reductn	88	84	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.09	1.68	1.08	0.84	0.87	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	953	206	358	1281	177	1550
v/c Ratio	0.71	0.29	0.86	0.57	0.20	1.93
Control Delay	37.3	9.6	66.3	3.3	34.4	441.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	9.6	66.3	3.3	34.4	441.1
Queue Length 50th (ft)	412	39	235	34	54	~1545
Queue Length 95th (ft)	483	m86	m229	m37	84	#1816
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1334	720	520	2265	898	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.29	0.69	0.57	0.20	1.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	384	108	251	32	16	468	480	167
v/c Ratio	0.38	0.69	0.17	0.37	0.08	0.85	0.81	0.25
Control Delay	37.4	71.4	11.8	66.7	0.9	50.2	45.5	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	71.4	11.8	66.7	0.9	50.2	45.5	4.3
Queue Length 50th (ft)	133	68	40	24	0	340	341	0
Queue Length 95th (ft)	191	#154	62	59	0	461	454	42
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1000	171	1486	91	190	632	682	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.63	0.17	0.35	0.08	0.74	0.70	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 8.6:

OPENING YEAR CUMULATIVE (2020) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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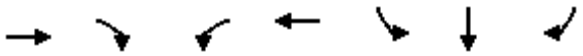


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1318	340	6	1035	343	350	428
v/c Ratio	0.45	0.38	0.04	0.60	0.67	0.64	0.73
Control Delay	11.8	3.2	27.7	9.7	25.2	23.3	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	3.2	27.7	9.7	25.2	23.3	21.6
Queue Length 50th (ft)	79	0	3	108	109	110	95
Queue Length 95th (ft)	146	47	m4	m118	#202	193	#224
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	895	134	1738	511	549	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.38	0.04	0.60	0.67	0.64	0.73

Intersection Summary

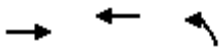
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	612	1348	652	380	210	430
v/c Ratio	1.25	0.58	0.45	0.53	1.23	1.15
Control Delay	153.0	6.4	13.5	10.7	173.0	122.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	153.0	6.4	13.5	10.7	173.0	122.8
Queue Length 50th (ft)	~154	73	84	55	~106	~103
Queue Length 95th (ft)	#241	182	123	124	#230	#190
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	491	2308	1453	723	171	374
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.25	0.58	0.45	0.53	1.23	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

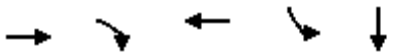
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2573	1101	600
v/c Ratio	0.91dr	0.35	1.22dr
Control Delay	10.6	8.4	38.9
Queue Delay	0.0	0.0	0.0
Total Delay	10.6	8.4	38.9
Queue Length 50th (ft)	197	95	159
Queue Length 95th (ft)	256	131	180
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3063	3147	1036
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.84	0.35	0.58

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1835	95	1288	694	645
v/c Ratio	0.84	0.13	0.60	0.97	0.89
Control Delay	27.2	3.9	14.0	51.0	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	3.9	14.0	51.0	36.3
Queue Length 50th (ft)	334	0	100	381	311
Queue Length 95th (ft)	324	19	101	#502	383
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2174	712	2157	731	740
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.13	0.60	0.95	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	480	470	381	514	1080	1172	537
v/c Ratio	1.22	1.18	0.84	1.40	0.50	0.98	0.63
Control Delay	153.7	135.5	41.5	209.9	22.2	51.6	5.7
Queue Delay	0.0	0.0	0.0	0.0	3.3	7.1	0.0
Total Delay	153.7	135.5	41.5	209.9	25.5	58.7	5.7
Queue Length 50th (ft)	~356	~354	158	~398	325	342	0
Queue Length 95th (ft)	#554	#564	#327	m#421	m323	#488	72
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	392	399	451	367	2147	1197	857
Starvation Cap Reductn	0	0	0	0	942	0	0
Spillback Cap Reductn	0	0	0	0	0	38	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	1.18	0.84	1.40	0.90	1.01	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	336	771	1203	720	331	1727
v/c Ratio	0.82	1.72	1.01	0.76	0.92	0.82
Control Delay	49.3	357.5	59.4	9.3	44.3	7.1
Queue Delay	13.2	1.3	0.0	0.0	0.0	14.3
Total Delay	62.5	358.8	59.4	9.3	44.3	21.4
Queue Length 50th (ft)	188	~658	~392	23	158	101
Queue Length 95th (ft)	#338	#894	#521	155	m146	m94
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	409	448	1192	947	376	2109
Starvation Cap Reductn	0	0	0	0	0	405
Spillback Cap Reductn	60	58	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.98	1.01	0.76	0.88	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	593	325	640	1330	78	1115
v/c Ratio	0.56	0.46	1.17	0.59	0.09	1.31
Control Delay	59.2	24.6	112.9	0.8	33.1	168.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	24.6	112.9	0.8	33.1	168.5
Queue Length 50th (ft)	249	109	~580	7	23	~758
Queue Length 95th (ft)	m266	m118	m#527	m7	43	#1019
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1068	701	548	2265	898	848
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.46	1.17	0.59	0.09	1.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

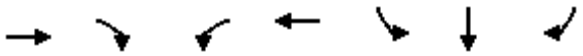
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	948	453	278	70	343	167	167	41
v/c Ratio	1.06	0.99	0.14	0.95	0.82	0.68	0.64	0.11
Control Delay	89.3	81.1	3.6	147.9	22.8	61.0	57.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	81.1	3.6	147.9	22.8	61.0	57.5	0.6
Queue Length 50th (ft)	~424	333	11	55	0	130	129	0
Queue Length 95th (ft)	#557	#651	17	#152	#146	190	187	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	896	458	2010	74	416	370	396	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.99	0.14	0.95	0.82	0.45	0.42	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1272	753	19	1056	358	371	759
v/c Ratio	0.43	0.78	0.14	0.61	0.70	0.66	1.29
Control Delay	11.7	13.2	37.1	9.5	26.6	23.9	164.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	13.2	37.1	9.5	26.6	23.9	164.0
Queue Length 50th (ft)	76	54	8	83	115	118	~334
Queue Length 95th (ft)	140	#320	m13	m103	#232	205	#527
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2941	970	134	1738	511	561	588
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.78	0.14	0.61	0.70	0.66	1.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

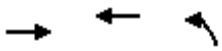
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	459	1320	705	700	197	320
v/c Ratio	0.85	0.62	0.58	1.02	0.80	0.60
Control Delay	40.2	9.8	17.9	56.6	51.6	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	9.8	17.9	56.6	51.6	28.4
Queue Length 50th (ft)	80	63	105	~192	76	59
Queue Length 95th (ft)	m#158	313	153	#405	#184	97
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	540	2137	1225	686	245	530
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.62	0.58	1.02	0.80	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

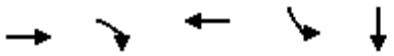
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1847	987	547
v/c Ratio	0.55	0.28	1.07dr
Control Delay	6.0	7.2	52.5
Queue Delay	0.0	0.0	0.0
Total Delay	6.0	7.2	52.5
Queue Length 50th (ft)	137	92	195
Queue Length 95th (ft)	228	136	242
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3379	3465	997
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.55	0.28	0.55

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	755	92	1114	915	923
v/c Ratio	0.59	0.20	0.87	0.88	0.92
Control Delay	41.4	8.2	46.1	27.9	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	8.2	46.1	27.9	32.5
Queue Length 50th (ft)	189	0	285	538	571
Queue Length 95th (ft)	235	41	#349	#929	#968
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1271	455	1282	1041	1008
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.20	0.87	0.88	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	404	397	368	629	1167	1019	589
v/c Ratio	0.94	0.91	0.80	1.81	0.56	0.88	0.66
Control Delay	64.6	56.8	37.1	390.2	23.6	38.4	6.2
Queue Delay	0.0	0.0	0.0	0.0	5.2	0.0	0.0
Total Delay	64.6	56.8	37.1	390.2	28.8	38.4	6.2
Queue Length 50th (ft)	232	227	156	~562	366	284	0
Queue Length 95th (ft)	#415	#413	#305	m#513	m321	#400	79
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	443	451	475	347	2066	1159	886
Starvation Cap Reductn	0	0	0	0	823	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.88	0.77	1.81	0.94	0.88	0.66

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	367	632	1336	870	326	1351
v/c Ratio	0.86	1.42	1.15	0.93	0.91	0.65
Control Delay	52.4	228.6	109.6	24.6	52.4	5.6
Queue Delay	51.8	2.3	0.0	0.0	0.0	1.2
Total Delay	104.2	231.0	109.6	24.6	52.4	6.8
Queue Length 50th (ft)	208	~494	~487	121	137	67
Queue Length 95th (ft)	#372	#717	#618	#432	m182	m90
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	426	445	1157	940	376	2071
Starvation Cap Reductn	0	0	0	0	0	459
Spillback Cap Reductn	98	94	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.12	1.80	1.15	0.93	0.87	0.84

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	957	206	358	1427	177	1588
v/c Ratio	0.71	0.28	0.89	0.63	0.20	2.07
Control Delay	36.2	8.8	69.1	4.4	34.4	504.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	8.8	69.1	4.4	34.4	504.9
Queue Length 50th (ft)	413	38	231	36	54	~1670
Queue Length 95th (ft)	483	m73	m239	m64	84	#1938
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1357	731	463	2265	898	767
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.28	0.77	0.63	0.20	2.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	387	108	261	32	16	468	480	167
v/c Ratio	0.39	0.69	0.18	0.37	0.08	0.85	0.81	0.25
Control Delay	37.4	73.4	10.9	66.7	0.9	50.2	45.5	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	73.4	10.9	66.7	0.9	50.2	45.5	4.3
Queue Length 50th (ft)	134	69	39	24	0	340	341	0
Queue Length 95th (ft)	192	m#134	58	59	0	461	454	42
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1000	171	1486	91	190	632	682	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.63	0.18	0.35	0.08	0.74	0.70	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 8.7:

OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4165*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1539*	pc/h/ln
S	*68.7*	mph
D = v_p / S	*22.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3228*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1187*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3869*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1430*	pc/h/ln
S	*69.4*	mph
D = v_p / S	*20.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4494*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2479*	pc/h/ln
S	*51.0*	mph
D = v_p / S	*48.6*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4578*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1700*	pc/h/ln
S	*67.1*	mph
D = v_p / S	*25.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3506*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1296*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6284*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2413*	pc/h/ln
S	*52.9*	mph
D = v_p / S	*45.6*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4659*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1823*	pc/h/ln
S	*65.5*	mph
D = v_p / S	*27.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7015*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1935*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7120*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1973*	pc/h/ln
S	*63.1*	mph
D = v_p / S	*31.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7183*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2020*	pc/h/ln
S	*62.2*	mph
D = v_p / S	*32.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7205*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2017*	pc/h/ln
S	*62.3*	mph
D = v_p / S	*32.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3746*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1378*	pc/h/ln
S	*69.6*	mph
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2393*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*880*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3800*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1397*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3705*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2044*	pc/h/ln
S	*61.7*	mph
D = v_p / S	*33.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4551*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1690*	pc/h/ln
S	*67.2*	mph
D = v_p / S	*25.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3477*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1291*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5661*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2143*	pc/h/ln
S	*59.7*	mph
D = v_p / S	*35.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4821*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1852*	pc/h/ln
S	*65.1*	mph
D = v_p / S	*28.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7305*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2025*	pc/h/ln
S	*62.1*	mph
D = v_p / S	*32.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7371*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2033*	pc/h/ln
S	*62.0*	mph
D = v_p / S	*32.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6542*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1813*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) NP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6626*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1846*	pc/h/ln
S	*65.2*	mph
D = v_p / S	*28.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 8.8:

OPENING YEAR CUMULATIVE (2020) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4265*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1584*	pc/h/ln
S	*68.3*	mph
D = v_p / S	*23.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3289*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1210*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3930*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1452*	pc/h/ln
S	*69.3*	mph
D = v_p / S	*21.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4513*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2490*	pc/h/ln
S	*50.7*	mph
D = v_p / S	*49.1*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4597*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1707*	pc/h/ln
S	*67.0*	mph
D = v_p / S	*25.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3518*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1300*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6296*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2418*	pc/h/ln
S	*52.8*	mph
D = v_p / S	*45.8*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4759*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*16*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.926*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1862*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7023*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1937*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7171*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1988*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*31.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7223*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2031*	pc/h/ln
S	*62.0*	mph
D = v_p / S	*32.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7215*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2019*	pc/h/ln
S	*62.2*	mph
D = v_p / S	*32.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3773*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1394*	pc/h/ln
S	*69.6*	mph
D = v_p / S	*20.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2409*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*886*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*12.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3816*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1410*	pc/h/ln
S	*69.5*	mph
D = v_p / S	*20.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3799*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2106*	pc/h/ln
S	*60.5*	mph
D = v_p / S	*34.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4645*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1725*	pc/h/ln
S	*66.8*	mph
D = v_p / S	*25.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3534*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1312*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5718*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2165*	pc/h/ln
S	*59.2*	mph
D = v_p / S	*36.6*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4848*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1862*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7343*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2035*	pc/h/ln
S	*61.9*	mph
D = v_p / S	*32.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7384*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2037*	pc/h/ln
S	*61.9*	mph
D = v_p / S	*32.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6552*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1816*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*RV*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*9/19/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*Opening Year (2020) WP*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6674*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1859*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*28.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 8.9:

OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 4165	
	Ramp Volume, V_R: 937	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4165	0.92	Level	4	0	0.980	1.00	4618
Ramp	937	0.92	Level	10	0	0.952	1.00	1069
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.595 using Equation (Exhibit 13-7)

V_{12} = 3182 pc/h

V_3 or V_{av34} 1436 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4618	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3549	Exhibit 13-8	7200	No
V_R	1069	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3182	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.394 (Exhibit 13-12)

S_R = 59.0 mph (Exhibit 13-12)

S_0 = 75.1 mph (Exhibit 13-12)

S = 63.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3869	V_D =	183 veh/h
		Ramp Volume, V_R	847		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3869	0.92	Level	4	0	0.980	1.00	4290
Ramp	847	0.92	Level	12	0	0.943	1.00	976
UpStream								
DownStream	183	0.92	Level	19	0	0.913	1.00	218

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.608 using Equation (Exhibit 13-7)

V_{12} = 2990 pc/h

V_3 or V_{av34} 1300 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4290	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3314	Exhibit 13-8	7200	No
V_R	976	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2990	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.386 (Exhibit 13-12)

S_R= 59.2 mph (Exhibit 13-12)

S_0= 75.6 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 291 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3389	
	Ramp Volume, V_R: 552	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3389	0.92	Level	2	0	0.990	1.00	3721
Ramp	552	0.92	Level	15	0	0.930	1.00	645
UpStream	291	0.92	Level	11	0	0.948	1.00	334
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3721 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4366	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4366	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 36.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.604 (Exibit 13-11)

S_R = 53.1 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 53.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 553 veh/h
	Freeway Volume, V_F: 3389	
	Ramp Volume, V_R: 552	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3389	0.92	Level	2	0	0.990	1.00	3721
Ramp	552	0.92	Level	15	0	0.930	1.00	645
UpStream								
DownStream	553	0.92	Level	1	0	0.995	1.00	604

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3721 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4366	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4366	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 36.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.604 (Exibit 13-11)

S_R = 53.1 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 53.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	450	☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3506	V_D =	veh/h
		Ramp Volume, V_R	1071		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3506	0.92	Level	4	0	0.980	1.00	3887
Ramp	1071	0.92	Level	6	0	0.971	1.00	1199
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2294 pc/h

V_3 or V_{av34} = 1593 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2294 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5086	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3493	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.409 (Exibit 13-11)

S_R = 58.6 mph (Exhibit 13-11)

S_0 = 66.1 mph (Exhibit 13-11)

S = 60.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	812 veh/h	Freeway Volume, V_F	5425	V_D =	veh/h
		Ramp Volume, V_R	859		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5425	0.92	Level	12	0	0.943	1.00	6251
Ramp	859	0.92	Level	9	0	0.957	1.00	976
UpStream	812	0.92	Level	2	0	0.990	1.00	891
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3697 pc/h

V_3 or V_{av34} = 2554 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3697 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7227	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4673	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 38.3 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 0.693 (Exibit 13-11)

S_R = 50.6 mph (Exhibit 13-11)

S_0 = 61.9 mph (Exhibit 13-11)

S = 54.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	4659	V_D =	579 veh/h
		Ramp Volume, V_R	873		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4659	0.92	Level	16	0	0.926	1.00	5469
Ramp	873	0.92	Level	12	0	0.943	1.00	1006
UpStream								
DownStream	579	0.92	Level	4	0	0.980	1.00	642

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.577 using Equation (Exhibit 13-7)

V_{12} = 3581 pc/h

V_3 or V_{av34} 1888 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5469	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4463	Exhibit 13-8	7200	No
V_R	1006	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3581	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.389 (Exhibit 13-12)

S_R = 59.1 mph (Exhibit 13-12)

S_0 = 73.3 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	750	☑ No	☐ Off
L_{up} =	2200 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	890 veh/h	Freeway Volume, V_F	6230	V_D =	veh/h
		Ramp Volume, V_R	785		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6230	0.92	Level	1	0	0.995	1.00	6806
Ramp	785	0.92	Level	19	0	0.913	1.00	934
UpStream	890	0.92	Level	21	0	0.905	1.00	1069
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.101 using Equation (Exhibit 13-6)

V_{12} = 688 pc/h

V_3 or V_{av34} = 3059 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2722 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7740	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3656	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.404 (Exibit 13-11)

S_R = 58.7 mph (Exhibit 13-11)

S_0 = 64.4 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	175
Freeway Volume, V_F	7120
Ramp Volume, V_R	890
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2200 ft; V_D = 785 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7120	0.92	Level	4	0	0.980	1.00	7894
Ramp	890	0.92	Level	21	0	0.905	1.00	1069
UpStream								
DownStream	785	0.92	Level	19	0	0.913	1.00	934

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4045 pc/h

V_3 or V_{av34} 1924 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7894	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6825	Exhibit 13-8	9600	No
V_R	1069	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4045	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.5 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.394 (Exhibit 13-12)

S_R= 59.0 mph (Exhibit 13-12)

S_0= 73.2 mph (Exhibit 13-12)

S = 65.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	7183	V_D =	759 veh/h
		Ramp Volume, V_R	738		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7183	0.92	Level	7	0	0.966	1.00	8081
Ramp	738	0.92	Level	26	0	0.885	1.00	906
UpStream								
DownStream	759	0.92	Level	19	0	0.913	1.00	903

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4034 pc/h

V_3 or V_{av34} 2023 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8081	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7175	Exhibit 13-8	9600	No
V_R	906	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4034	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.380 (Exhibit 13-12)

S_R = 59.4 mph (Exhibit 13-12)

S_0 = 72.8 mph (Exhibit 13-12)

S = 65.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	2115 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	738 veh/h	Freeway Volume, V_F	6445	V_D =	veh/h
		Ramp Volume, V_R	759		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6445	0.92	Level	5	0	0.976	1.00	7181
Ramp	759	0.92	Level	19	0	0.913	1.00	903
UpStream	738	0.92	Level	26	0	0.885	1.00	906
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.105 using Equation (Exhibit 13-6)

V_{12} = 753 pc/h

V_3 or V_{av34} = 3214 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2872 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8084	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3775	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.446 (Exibit 13-11)

S_R = 57.5 mph (Exhibit 13-11)

S_0 = 64.0 mph (Exhibit 13-11)

S = 60.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3746	V_D =	veh/h
		Ramp Volume, V_R	1353		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3746	0.92	Level	3	0	0.985	1.00	4133
Ramp	1353	0.92	Level	4	0	0.980	1.00	1500
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.588 using Equation (Exhibit 13-7)

V_{12} = 3047 pc/h

V_3 or V_{av34} 1086 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4133	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2633	Exhibit 13-8	7200	No
V_R	1500	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3047	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.433 (Exhibit 13-12)

S_R = 57.9 mph (Exhibit 13-12)

S_0 = 76.5 mph (Exhibit 13-12)

S = 61.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3800	V_D =	352 veh/h
		Ramp Volume, V_R	1694		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3800	0.92	Level	3	0	0.985	1.00	4192
Ramp	1694	0.92	Level	5	0	0.976	1.00	1887
UpStream								
DownStream	352	0.92	Level	3	0	0.985	1.00	388

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.568 using Equation (Exhibit 13-7)

V_{12} = 3197 pc/h

V_3 or V_{av34} 995 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4192	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2305	Exhibit 13-8	7200	No
V_R	1887	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3197	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.468 (Exhibit 13-12)

S_R = 56.9 mph (Exhibit 13-12)

S_0 = 76.8 mph (Exhibit 13-12)

S = 60.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 1047 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2811	
	Ramp Volume, V_R: 824	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2811	0.92	Level	1	0	0.995	1.00	3071
Ramp	824	0.92	Level	11	0	0.948	1.00	945
UpStream	1047	0.92	Level	4	0	0.980	1.00	1161
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3071 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4016	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4016	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.514 (Exibit 13-11)

S_R = 55.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 55.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 70 veh/h
	Freeway Volume, V_F: 2811	
	Ramp Volume, V_R: 824	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2811	0.92	Level	1	0	0.995	1.00	3071
Ramp	824	0.92	Level	11	0	0.948	1.00	945
UpStream								
DownStream	70	0.92	Level	8	0	0.962	1.00	79

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3071 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4016	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4016	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.514 (Exibit 13-11)

S_R = 55.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 55.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	450	☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3477	V_D =	veh/h
		Ramp Volume, V_R	1074		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3477	0.92	Level	5	0	0.976	1.00	3874
Ramp	1074	0.92	Level	4	0	0.980	1.00	1191
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2286 pc/h

V_3 or V_{av34} = 1588 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2286 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5065	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3477	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.407 (Exibit 13-11)

S_R = 58.6 mph (Exhibit 13-11)

S_0 = 66.1 mph (Exhibit 13-11)

S = 60.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	393 veh/h	Freeway Volume, V_F	5019	V_D =	veh/h
		Ramp Volume, V_R	642		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5019	0.92	Level	8	0	0.962	1.00	5674
Ramp	642	0.92	Level	14	0	0.935	1.00	747
UpStream	393	0.92	Level	2	0	0.990	1.00	431
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3356 pc/h

V_3 or V_{av34} 2318 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3356 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6421	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4103	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 34.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.512 (Exibit 13-11)

S_R= 55.7 mph (Exhibit 13-11)

S_0= 63.4 mph (Exhibit 13-11)

S = 58.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	4821	V_D =	497 veh/h
		Ramp Volume, V_R	1419		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4821	0.92	Level	12	0	0.943	1.00	5555
Ramp	1419	0.92	Level	9	0	0.957	1.00	1612
UpStream								
DownStream	497	0.92	Level	2	0	0.990	1.00	546

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.547 using Equation (Exhibit 13-7)

V_{12} = 3769 pc/h

V_3 or V_{av34} 1786 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5555	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3943	Exhibit 13-8	7200	No
V_R	1612	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3769	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.443 (Exhibit 13-12)

S_R = 57.6 mph (Exhibit 13-12)

S_0 = 73.7 mph (Exhibit 13-12)

S = 62.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	750	☑ No	☐ Off
L_{up} =	2200 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	957 veh/h	Freeway Volume, V_F	6414	V_D =	veh/h
		Ramp Volume, V_R	891		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6414	0.92	Level	2	0	0.990	1.00	7041
Ramp	891	0.92	Level	18	0	0.917	1.00	1056
UpStream	957	0.92	Level	11	0	0.948	1.00	1097
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.086 using Equation (Exhibit 13-6)

V_{12} = 604 pc/h

V_3 or V_{av34} = 3218 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2816 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8097	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3872	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.441 (Exibit 13-11)

S_R = 57.7 mph (Exhibit 13-11)

S_0 = 64.2 mph (Exhibit 13-11)

S = 60.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	7371	V_D =	877 veh/h
		Ramp Volume, V_R	957		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7371	0.92	Level	3	0	0.985	1.00	8132
Ramp	957	0.92	Level	11	0	0.948	1.00	1097
UpStream								
DownStream	877	0.92	Level	18	0	0.917	1.00	1039

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4164 pc/h

V_3 or V_{av34} 1984 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8132	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7035	Exhibit 13-8	9600	No
V_R	1097	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4164	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 38.5 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.397 (Exhibit 13-12)

S_R = 58.9 mph (Exhibit 13-12)

S_0 = 73.0 mph (Exhibit 13-12)

S = 65.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	6542	V_D =	883 veh/h
		Ramp Volume, V_R	799		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6542	0.92	Level	4	0	0.980	1.00	7253
Ramp	799	0.92	Level	16	0	0.926	1.00	938
UpStream								
DownStream	883	0.92	Level	17	0	0.922	1.00	1041

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3691 pc/h

V_3 or V_{av34} 1781 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7253	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6315	Exhibit 13-8	9600	No
V_R	938	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3691	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.0 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.382 (Exhibit 13-12)

S_R= 59.3 mph (Exhibit 13-12)

S_0= 73.7 mph (Exhibit 13-12)

S = 65.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 799 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5743
Ramp Volume, V_R	883
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5743	0.92	Level	3	0	0.985	1.00	6336
Ramp	883	0.92	Level	17	0	0.922	1.00	1041
UpStream	799	0.92	Level	16	0	0.926	1.00	938
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.088 using Equation (Exhibit 13-6)
V_{12} = 556 pc/h
V_3 or V_{av34} = 2890 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2534 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7377	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3575	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.7 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.415 (Exibit 13-11)
S_R = 58.4 mph (Exhibit 13-11)
S_0 = 65.0 mph (Exhibit 13-11)
S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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APPENDIX 8.10:

OPENING YEAR CUMULATIVE (2020) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	4265	V_D =	veh/h
		Ramp Volume, V_R	976		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4265	0.92	Level	5	0	0.976	1.00	4752
Ramp	976	0.92	Level	11	0	0.948	1.00	1119
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.590 using Equation (Exhibit 13-7)

V_{12} = 3261 pc/h

V_3 or V_{av34} 1491 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4752	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3633	Exhibit 13-8	7200	No
V_R	1119	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3261	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.399 (Exhibit 13-12)

S_R = 58.8 mph (Exhibit 13-12)

S_0 = 74.9 mph (Exhibit 13-12)

S = 63.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3930	V_D =	183 veh/h
		Ramp Volume, V_R	908		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3930	0.92	Level	4	0	0.980	1.00	4357
Ramp	908	0.92	Level	13	0	0.939	1.00	1051
UpStream								
DownStream	183	0.92	Level	19	0	0.913	1.00	218

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.603 using Equation (Exhibit 13-7)

V_{12} = 3044 pc/h

V_3 or V_{av34} 1313 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4357	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3306	Exhibit 13-8	7200	No
V_R	1051	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3044	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.393 (Exhibit 13-12)

S_R= 59.0 mph (Exhibit 13-12)

S_0= 75.6 mph (Exhibit 13-12)

S = 63.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 291 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3389	
	Ramp Volume, V_R: 571	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3389	0.92	Level	2	0	0.990	1.00	3721
Ramp	571	0.92	Level	15	0	0.930	1.00	667
UpStream	291	0.92	Level	11	0	0.948	1.00	334
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3721 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4388	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4388	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 36.4 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.611 (Exibit 13-11)

S_R = 52.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 52.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 553 veh/h
	Freeway Volume, V_F: 3389	
	Ramp Volume, V_R: 571	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3389	0.92	Level	2	0	0.990	1.00	3721
Ramp	571	0.92	Level	15	0	0.930	1.00	667
UpStream								
DownStream	553	0.92	Level	1	0	0.995	1.00	604

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3721 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4388	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4388	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 36.4 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.611 (Exibit 13-11)

S_R = 52.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 52.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 3518	
	Ramp Volume, V_R: 1078	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3518	0.92	Level	4	0	0.980	1.00	3900
Ramp	1078	0.92	Level	6	0	0.971	1.00	1207
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2301 pc/h

V_3 or V_{av34} = 1599 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2301 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5107	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3508	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 29.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.411 (Exibit 13-11)

S_R = 58.5 mph (Exhibit 13-11)

S_0 = 66.0 mph (Exhibit 13-11)

S = 60.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	812 veh/h	Freeway Volume, V_F	5425	V_D =	veh/h
		Ramp Volume, V_R	871		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5425	0.92	Level	12	0	0.943	1.00	6251
Ramp	871	0.92	Level	10	0	0.952	1.00	994
UpStream	812	0.92	Level	2	0	0.990	1.00	891
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3697 pc/h

V_3 or V_{av34} 2554 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 3697 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7245	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4691	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 38.5 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 0.701 (Exibit 13-11)

S_R= 50.4 mph (Exhibit 13-11)

S_0= 61.9 mph (Exhibit 13-11)

S = 53.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	4759	V_D =	879 veh/h
		Ramp Volume, V_R	973		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4759	0.92	Level	16	0	0.926	1.00	5587
Ramp	973	0.92	Level	13	0	0.939	1.00	1126
UpStream								
DownStream	879	0.92	Level	4	0	0.980	1.00	975

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.569 using Equation (Exhibit 13-7)

V_{12} = 3662 pc/h

V_3 or V_{av34} 1925 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5587	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4461	Exhibit 13-8	7200	No
V_R	1126	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3662	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.399 (Exhibit 13-12)

S_R= 58.8 mph (Exhibit 13-12)

S_0= 73.2 mph (Exhibit 13-12)

S = 63.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	750	☑ No	☐ Off
L_{up} =	2200 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	941 veh/h	Freeway Volume, V_F	6230	V_D =	veh/h
		Ramp Volume, V_R	793		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6230	0.92	Level	1	0	0.995	1.00	6806
Ramp	793	0.92	Level	19	0	0.913	1.00	944
UpStream	941	0.92	Level	23	0	0.897	1.00	1140
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.100 using Equation (Exhibit 13-6)

V_{12} = 679 pc/h

V_3 or V_{av34} = 3063 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2722 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7750	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3666	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 28.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.406 (Exibit 13-11)

S_R = 58.6 mph (Exhibit 13-11)

S_0 = 64.4 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	7171	V_D =	793 veh/h
		Ramp Volume, V_R	941		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7171	0.92	Level	4	0	0.980	1.00	7950
Ramp	941	0.92	Level	23	0	0.897	1.00	1140
UpStream								
DownStream	793	0.92	Level	19	0	0.913	1.00	944

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4109 pc/h

V_3 or V_{av34} 1920 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7950	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6810	Exhibit 13-8	9600	No
V_R	1140	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4109	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 38.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.401 (Exhibit 13-12)

S_R = 58.8 mph (Exhibit 13-12)

S_0 = 73.2 mph (Exhibit 13-12)

S = 65.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	7223	V_D =	769 veh/h
		Ramp Volume, V_R	778		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7223	0.92	Level	7	0	0.966	1.00	8126
Ramp	778	0.92	Level	28	0	0.877	1.00	964
UpStream								
DownStream	769	0.92	Level	20	0	0.909	1.00	919

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4087 pc/h

V_3 or V_{av34} 2019 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8126	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7162	Exhibit 13-8	9600	No
V_R	964	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4087	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.4 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.385 (Exhibit 13-12)

S_R = 59.2 mph (Exhibit 13-12)

S_0 = 72.8 mph (Exhibit 13-12)

S = 65.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 778 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	6445
Ramp Volume, V_R	769
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6445	0.92	Level	5	0	0.976	1.00	7181
Ramp	769	0.92	Level	20	0	0.909	1.00	919
UpStream	778	0.92	Level	28	0	0.877	1.00	964
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.103 using Equation (Exhibit 13-6)
V_{12} = 739 pc/h
V_3 or V_{av34} = 3221 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2872 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8100	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3791	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 31.5 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.449 (Exibit 13-11)
S_R = 57.4 mph (Exhibit 13-11)
S_0 = 64.0 mph (Exhibit 13-11)
S = 60.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	3773	V_D =	veh/h
		Ramp Volume, V_R	1364		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3773	0.92	Level	4	0	0.980	1.00	4183
Ramp	1364	0.92	Level	4	0	0.980	1.00	1512
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.586 using Equation (Exhibit 13-7)

V_{12} = 3077 pc/h

V_3 or V_{av34} 1106 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4183	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2671	Exhibit 13-8	7200	No
V_R	1512	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3077	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 29.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.434 (Exhibit 13-12)

S_R = 57.8 mph (Exhibit 13-12)

S_0 = 76.4 mph (Exhibit 13-12)

S = 61.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	3816	V_D =	352 veh/h
		Ramp Volume, V_R	1710		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3816	0.92	Level	4	0	0.980	1.00	4231
Ramp	1710	0.92	Level	5	0	0.976	1.00	1905
UpStream								
DownStream	352	0.92	Level	3	0	0.985	1.00	388

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.567 using Equation (Exhibit 13-7)

V_{12} = 3223 pc/h

V_3 or V_{av34} 1008 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4231	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	2326	Exhibit 13-8	7200	No
V_R	1905	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3223	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.469 (Exhibit 13-12)

S_R= 56.9 mph (Exhibit 13-12)

S_0= 76.8 mph (Exhibit 13-12)

S = 60.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	475	☑ No	☐ Off
L_{up} =	1460 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	1047 veh/h	Freeway Volume, V_F	2811	V_D =	veh/h
		Ramp Volume, V_R	918		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	25.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2811	0.92	Level	1	0	0.995	1.00	3071
Ramp	918	0.92	Level	13	0	0.939	1.00	1063
UpStream	1047	0.92	Level	4	0	0.980	1.00	1161
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3071 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4134	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4134	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 34.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.541 (Exibit 13-11)

S_R = 54.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 54.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 70 veh/h
	Freeway Volume, V_F: 2811	
	Ramp Volume, V_R: 918	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2811	0.92	Level	1	0	0.995	1.00	3071
Ramp	918	0.92	Level	13	0	0.939	1.00	1063
UpStream								
DownStream	70	0.92	Level	8	0	0.962	1.00	79

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3071 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4134	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4134	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 34.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.541 (Exibit 13-11)

S_R = 54.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 54.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes ☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A	450	☑ No ☐ Off
L_{up} =	ft	Deceleration Lane Length L_D		L_{down} = ft
V_u =	veh/h	Freeway Volume, V_F	3534	V_D = veh/h
		Ramp Volume, V_R	1111	
		Freeway Free-Flow Speed, S_{FF}	70.0	
		Ramp Free-Flow Speed, S_{FR}	45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3534	0.92	Level	5	0	0.976	1.00	3937
Ramp	1111	0.92	Level	5	0	0.976	1.00	1238
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 2323 pc/h

V_3 or V_{av34} = 1614 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2323 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5175	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3561	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.418 (Exibit 13-11)

S_R = 58.3 mph (Exhibit 13-11)

S_0 = 66.0 mph (Exhibit 13-11)

S = 60.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	CHS
Agency or Company	Urban Crossroads, Inc.
Date Performed	9/20/2016
Analysis Time Period	PM Peak Hour

Site Information

Freeway/Dir of Travel	SR-71 Northbound
Junction	On-ramp at Central
Jurisdiction	Caltrans
Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 1170 ft

V_u = 393 veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5019
Ramp Volume, V_R	699
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5019	0.92	Level	8	0	0.962	1.00	5674
Ramp	699	0.92	Level	15	0	0.930	1.00	817
UpStream	393	0.92	Level	2	0	0.990	1.00	431
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 3356 pc/h

V_3 or V_{av34} = 2318 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3356 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6491	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4173	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 34.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.529 (Exibit 13-11)

S_R = 55.2 mph (Exhibit 13-11)

S_0 = 63.4 mph (Exhibit 13-11)

S = 57.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	4848	V_D =	497 veh/h
		Ramp Volume, V_R	1446		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4848	0.92	Level	12	0	0.943	1.00	5586
Ramp	1446	0.92	Level	9	0	0.957	1.00	1642
UpStream								
DownStream	497	0.92	Level	2	0	0.990	1.00	546

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.545 using Equation (Exhibit 13-7)

V_{12} = 3791 pc/h

V_3 or V_{av34} 1795 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5586	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3944	Exhibit 13-8	7200	No
V_R	1642	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3791	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.9 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.446 (Exhibit 13-12)

S_R= 57.5 mph (Exhibit 13-12)

S_0= 73.7 mph (Exhibit 13-12)

S = 61.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 2200 ft	Acceleration Lane Length, L_A: 750	L_{down} = ft
V_u = 970 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6414	
	Ramp Volume, V_R: 929	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6414	0.92	Level	2	0	0.990	1.00	7041
Ramp	929	0.92	Level	20	0	0.909	1.00	1111
UpStream	970	0.92	Level	11	0	0.948	1.00	1112
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.079 using Equation (Exhibit 13-6)

V_{12} = 556 pc/h

V_3 or V_{av34} = 3242 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2816 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8152	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3927	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.451 (Exibit 13-11)

S_R = 57.4 mph (Exhibit 13-11)

S_0 = 64.2 mph (Exhibit 13-11)

S = 60.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	175
Freeway Volume, V_F	7384
Ramp Volume, V_R	970
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2200 ft; V_D = 929 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7384	0.92	Level	3	0	0.985	1.00	8146
Ramp	970	0.92	Level	11	0	0.948	1.00	1112
UpStream								
DownStream	929	0.92	Level	20	0	0.909	1.00	1111

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4179 pc/h

V_3 or V_{av34} 1983 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8146	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7034	Exhibit 13-8	9600	No
V_R	1112	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4179	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 38.6 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.398 (Exhibit 13-12)

S_R= 58.9 mph (Exhibit 13-12)

S_0= 73.0 mph (Exhibit 13-12)

S = 65.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	9/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	220
Freeway Volume, V_F	6552
Ramp Volume, V_R	809
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2115 ft; V_D = 931 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6552	0.92	Level	4	0	0.980	1.00	7264
Ramp	809	0.92	Level	17	0	0.922	1.00	954
UpStream								
DownStream	931	0.92	Level	19	0	0.913	1.00	1108

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3705 pc/h

V_3 or V_{av34} 1779 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7264	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6310	Exhibit 13-8	9600	No
V_R	954	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3705	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)

S_R= 59.3 mph (Exhibit 13-12)

S_0= 73.8 mph (Exhibit 13-12)

S = 65.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	9/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2020 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 809 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5743
Ramp Volume, V_R	931
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5743	0.92	Level	3	0	0.985	1.00	6336
Ramp	931	0.92	Level	19	0	0.913	1.00	1108
UpStream	809	0.92	Level	17	0	0.922	1.00	954
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.079 using Equation (Exhibit 13-6)
V_{12} = 502 pc/h
V_3 or V_{av34} = 2917 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2534 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7444	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3642	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.2 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.425 (Exibit 13-11)
S_R = 58.1 mph (Exhibit 13-11)
S_0 = 65.0 mph (Exhibit 13-11)
S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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APPENDIX 8.11:

OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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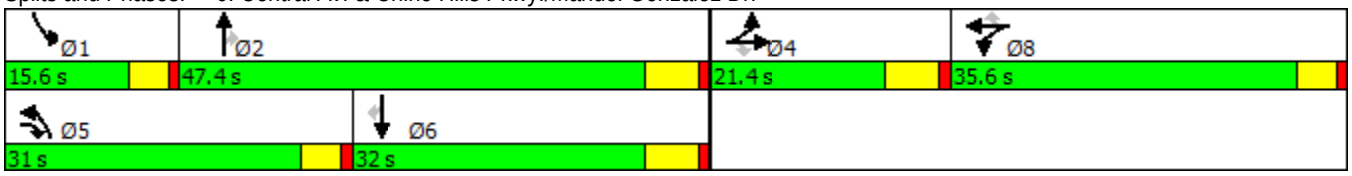
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	54	265	2	3	8	382	861	47	67	708	265
Future Volume (vph)	319	54	265	2	3	8	382	861	47	67	708	265
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	5	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	31.0	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	25.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	47.1	13.5	13.5	13.5	26.9	47.6	47.6	8.2	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.50	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.78	0.74	0.32	0.01	0.01	0.03	0.90	0.54	0.06	0.52	0.80	0.51
Control Delay	61.7	56.9	2.4	35.5	35.3	0.1	59.2	21.5	0.1	57.9	40.5	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	56.9	2.4	35.5	35.3	0.1	59.2	21.5	0.1	57.9	40.5	15.3
LOS	E	E	A	D	D	A	E	C	A	E	D	B
Approach Delay		35.7			12.7			31.9			35.2	
Approach LOS		D			B			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 33.8	Intersection LOS: C
Intersection Capacity Utilization 75.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	319	54	265	2	3	8	382	861	47	67	708	265
Future Volume (veh/h)	319	54	265	2	3	8	382	861	47	67	708	265
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	389	0	192	2	3	4	415	936	39	73	770	233
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	483	0	650	36	41	34	447	1805	791	91	1053	465
Arrive On Green	0.15	0.00	0.15	0.02	0.02	0.02	0.28	0.53	0.53	0.06	0.31	0.31
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	389	0	192	2	3	4	415	936	39	73	770	233
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	9.9	0.0	7.0	0.1	0.1	0.2	21.2	15.1	1.1	3.8	17.1	10.7
Cycle Q Clear(g_c), s	9.9	0.0	7.0	0.1	0.1	0.2	21.2	15.1	1.1	3.8	17.1	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	483	0	650	36	41	34	447	1805	791	91	1053	465
V/C Ratio(X)	0.81	0.00	0.30	0.05	0.07	0.12	0.93	0.52	0.05	0.80	0.73	0.50
Avail Cap(c_a), veh/h	594	0	703	590	656	558	502	1805	791	209	1053	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	0.0	16.1	40.7	40.7	40.7	30.0	13.1	9.7	39.7	26.3	24.1
Incr Delay (d2), s/veh	6.6	0.0	0.3	0.6	0.8	1.5	21.5	1.1	0.1	6.0	4.5	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	3.0	0.1	0.1	0.1	12.1	7.3	0.5	1.9	8.7	5.0
LnGrp Delay(d),s/veh	41.6	0.0	16.3	41.3	41.5	42.2	51.5	14.1	9.9	45.7	30.8	27.9
LnGrp LOS	D		B	D	D	D	D	B	A	D	C	C
Approach Vol, veh/h		581			9			1390			1076	
Approach Delay, s/veh		33.2			41.8			25.2			31.2	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.4	50.7		18.5	28.1	32.0		6.5
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.8	17.1		11.9	23.2	19.1		2.2
Green Ext Time (p_c), s	0.0	17.6		0.8	0.2	6.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.9
HCM 2010 LOS	C

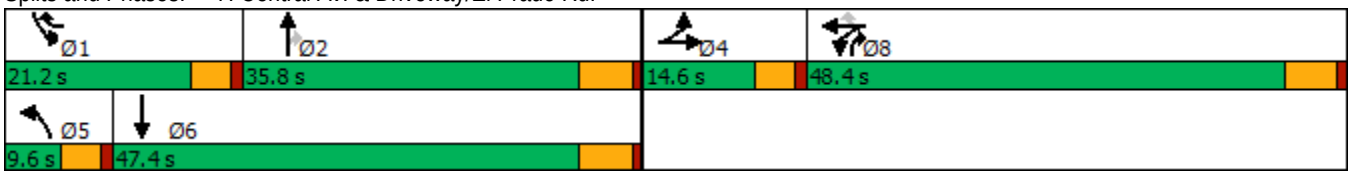
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1067	3	519	2	798	709	406	652
Future Volume (vph)	1	1	1067	3	519	2	798	709	406	652
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	48.4	48.4	21.2	9.6	35.8	48.4	21.2	47.4
Total Split (%)	12.2%	12.2%	40.3%	40.3%	17.7%	8.0%	29.8%	40.3%	17.7%	39.5%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	42.7	42.7	65.2	5.0	30.1	72.8	16.6	49.6
Actuated g/C Ratio	0.09	0.09	0.39	0.39	0.60	0.05	0.28	0.67	0.15	0.46
v/c Ratio	0.01	0.01	0.98	0.93	0.56	0.03	0.93	0.66	0.94	0.33
Control Delay	48.0	41.0	65.9	54.5	9.1	53.0	56.1	5.4	74.4	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	65.9	54.5	9.1	53.0	56.1	5.4	74.4	20.4
LOS	D	D	E	D	A	D	E	A	E	C
Approach Delay		43.3		43.5			32.2			40.9
Approach LOS		D		D			C			D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 108.3
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 38.8 — Intersection LOS: D
Intersection Capacity Utilization 89.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1067	3	519	2	798	709	406	652	10
Future Volume (veh/h)	1	1	1	1067	3	519	2	798	709	406	652	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	1	1	1	1188	0	434	2	887	619	451	724	9
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1238	0	815	4	928	995	472	2095	26
Arrive On Green	0.01	0.01	0.01	0.38	0.00	0.38	0.00	0.27	0.27	0.15	0.42	0.42
Sat Flow, veh/h	1619	827	827	3238	0	1530	1619	3420	1510	3141	5003	62
Grp Volume(v), veh/h	1	0	2	1188	0	434	2	887	619	451	474	259
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1619	0	1530	1619	1710	1510	1570	1638	1789
Q Serve(g_s), s	0.1	0.0	0.1	39.6	0.0	20.5	0.1	28.2	26.6	15.8	10.9	10.9
Cycle Q Clear(g_c), s	0.1	0.0	0.1	39.6	0.0	20.5	0.1	28.2	26.6	15.8	10.9	10.9
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	13	0	13	1238	0	815	4	928	995	472	1372	749
V/C Ratio(X)	0.08	0.00	0.15	0.96	0.00	0.53	0.46	0.96	0.62	0.96	0.35	0.35
Avail Cap(c_a), veh/h	146	0	150	1248	0	819	73	928	995	472	1372	749
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	0.0	54.5	33.3	0.0	16.9	55.1	39.6	11.2	46.6	21.8	21.8
Incr Delay (d2), s/veh	0.9	0.0	2.0	16.6	0.0	0.7	25.4	20.6	2.9	30.3	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	20.5	0.0	8.8	0.1	16.0	19.6	8.8	5.1	5.7
LnGrp Delay(d),s/veh	55.4	0.0	56.4	49.9	0.0	17.5	80.4	60.3	14.2	76.9	22.5	23.1
LnGrp LOS	E		E	D		B	F	E	B	E	C	C
Approach Vol, veh/h		3			1622			1508			1184	
Approach Delay, s/veh		56.1			41.2			41.4			43.4	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.2	35.8		5.5	4.9	52.1		48.1
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	16.6	30.0		10.0	5.0	41.6		42.6
Max Q Clear Time (g_c+I1), s	17.8	30.2		2.1	2.1	12.9		41.6
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	6.6		0.7

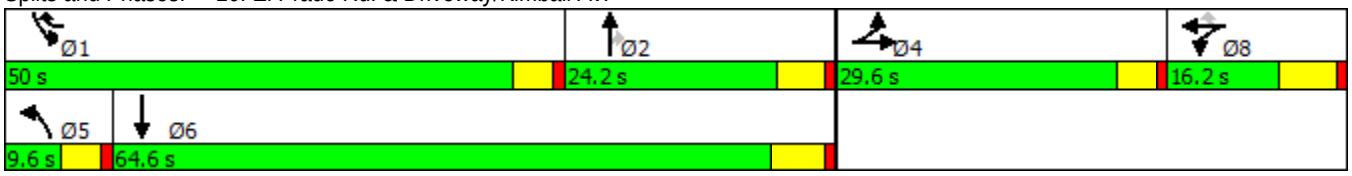
Intersection Summary	
HCM 2010 Ctrl Delay	41.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	1	27	1298	5	293	33	754	213
Future Volume (vph)	12	1	27	1298	5	293	33	754	213
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	50.0	9.6	24.2	24.2	50.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	41.7%	8.0%	20.2%	20.2%	41.7%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	59.0	5.1	19.5	19.5	46.6	60.4
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.63
v/c Ratio	0.06	0.01	0.31	1.12	0.06	0.82	0.08	0.51	0.24
Control Delay	40.2	30.3	50.1	79.7	52.6	58.9	0.4	21.5	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.3	50.1	79.7	52.6	58.9	0.4	21.5	11.4
LOS	D	C	D	E	D	E	A	C	B
Approach Delay		38.2	78.5			52.9			18.9
Approach LOS		D	E			D			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 52.9	Intersection LOS: D
Intersection Capacity Utilization 121.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	2	29	27	1298	5	293	33	754	213	44
Future Volume (veh/h)	12	1	2	29	27	1298	5	293	33	754	213	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	1	1	30	28	463	5	299	34	769	217	45
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	55	28	28	136	127	664	122	384	326	892	611	127
Arrive On Green	0.03	0.03	0.03	0.15	0.15	0.15	0.08	0.21	0.21	0.28	0.42	0.42
Sat Flow, veh/h	1619	827	827	908	847	1530	1619	1800	1530	3141	1447	300
Grp Volume(v), veh/h	12	0	2	58	0	463	5	299	34	769	0	262
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1570	0	1747
Q Serve(g_s), s	0.5	0.0	0.1	1.9	0.0	10.0	0.2	10.4	1.2	15.5	0.0	6.8
Cycle Q Clear(g_c), s	0.5	0.0	0.1	1.9	0.0	10.0	0.2	10.4	1.2	15.5	0.0	6.8
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	55	0	57	263	0	664	122	384	326	892	0	737
V/C Ratio(X)	0.22	0.00	0.04	0.22	0.00	0.70	0.04	0.78	0.10	0.86	0.00	0.36
Avail Cap(c_a), veh/h	608	0	621	263	0	664	122	514	436	2141	0	1542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.3	0.0	31.1	24.9	0.0	15.3	28.6	24.7	21.1	22.6	0.0	13.1
Incr Delay (d2), s/veh	1.9	0.0	0.3	0.4	0.0	3.2	0.1	5.4	0.1	1.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.0	0.0	7.4	0.1	5.7	0.5	6.7	0.0	3.3
LnGrp Delay(d),s/veh	33.2	0.0	31.3	25.3	0.0	18.5	28.6	30.1	21.2	23.6	0.0	13.4
LnGrp LOS	C		C	C		B	C	C	C	C		B
Approach Vol, veh/h		14			521			338			1031	
Approach Delay, s/veh		32.9			19.2			29.2			21.0	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.5	20.0		6.9	9.6	33.9		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	45.4	* 19		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	17.5	12.4		2.5	2.2	8.8		12.0
Green Ext Time (p_c), s	1.5	1.8		0.0	0.0	3.5		0.0

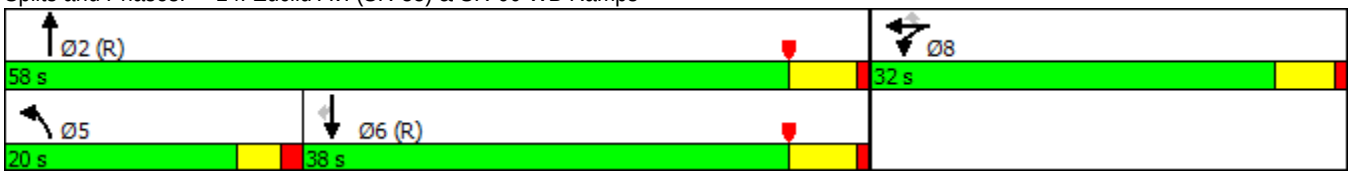
Intersection Summary	
HCM 2010 Ctrl Delay	22.1
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	757	2	393	465	1001	1074	499
Future Volume (vph)	757	2	393	465	1001	1074	499
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	32.0	32.0	32.0	20.0	58.0	38.0	38.0
Total Split (%)	35.6%	35.6%	35.6%	22.2%	64.4%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	26.6	26.6	26.6	15.5	52.9	32.9	32.9
Actuated g/C Ratio	0.30	0.30	0.30	0.17	0.59	0.37	0.37
v/c Ratio	0.95	0.93	0.77	0.93	0.54	0.92	0.61
Control Delay	64.7	59.5	34.1	51.2	17.9	41.1	5.3
Queue Delay	2.3	1.7	0.0	0.0	1.3	0.0	0.0
Total Delay	67.0	61.2	34.1	51.2	19.2	41.1	5.3
LOS	E	E	C	D	B	D	A
Approach Delay		54.8			29.3	29.7	
Approach LOS		D			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 50 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 36.5	Intersection LOS: D
Intersection Capacity Utilization 135.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	757	2	393	465	1001	0	0	1074	499
Future Volume (veh/h)	0	0	0	757	2	393	465	1001	0	0	1074	499
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				898	0	179	500	1076	0	0	1155	537
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				956	0	452	541	2011	0	0	1251	547
Arrive On Green				0.30	0.00	0.30	0.06	0.19	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1530	3141	3510	0	0	3510	1496
Grp Volume(v), veh/h				898	0	179	500	1076	0	0	1155	537
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1570	1710	0	0	1710	1496
Q Serve(g_s), s				24.3	0.0	8.4	14.3	25.5	0.0	0.0	29.1	32.0
Cycle Q Clear(g_c), s				24.3	0.0	8.4	14.3	25.5	0.0	0.0	29.1	32.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				956	0	452	541	2011	0	0	1251	547
V/C Ratio(X)				0.94	0.00	0.40	0.92	0.54	0.00	0.00	0.92	0.98
Avail Cap(c_a), veh/h				971	0	459	541	2011	0	0	1251	547
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.52	0.52	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				30.9	0.0	25.3	41.9	25.2	0.0	0.0	27.3	28.2
Incr Delay (d2), s/veh				15.8	0.0	0.2	13.1	0.5	0.0	0.0	12.7	34.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				13.0	0.0	3.6	7.2	12.2	0.0	0.0	15.8	18.3
LnGrp Delay(d),s/veh				46.8	0.0	25.5	55.0	25.7	0.0	0.0	40.0	62.3
LnGrp LOS				D		C	E	C			D	E
Approach Vol, veh/h					1077			1576			1692	
Approach Delay, s/veh					43.2			35.0			47.1	
Approach LOS					D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.4			20.0	38.4		31.6
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		52.5			15.5	32.5		27.0
Max Q Clear Time (g_c+I1), s		27.5			16.3	34.0		26.3
Green Ext Time (p_c), s		22.4			0.0	0.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	41.8
HCM 2010 LOS	D

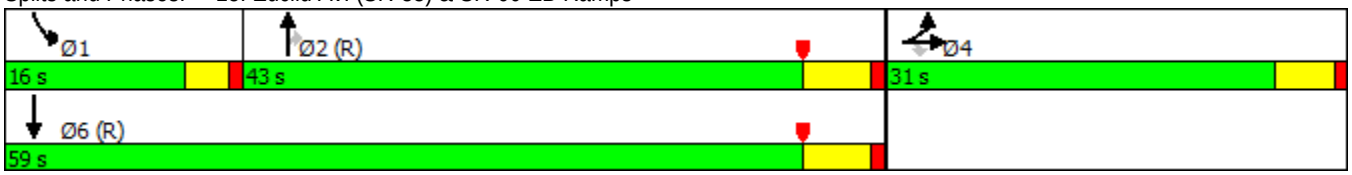
Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	351	0	622	1115	660	311	1520
Future Volume (vph)	351	0	622	1115	660	311	1520
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	31.0	31.0	31.0	43.0	43.0	16.0	59.0
Total Split (%)	34.4%	34.4%	34.4%	47.8%	47.8%	17.8%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	23.2	23.2	23.2	40.6	40.6	11.7	56.3
Actuated g/C Ratio	0.26	0.26	0.26	0.45	0.45	0.13	0.63
v/c Ratio	0.85	0.84	0.80	0.77	0.66	0.81	0.76
Control Delay	52.2	43.0	37.9	25.9	4.9	45.4	5.3
Queue Delay	0.3	0.2	0.0	0.0	0.0	0.0	1.1
Total Delay	52.4	43.2	37.9	25.9	4.9	45.4	6.3
LOS	D	D	D	C	A	D	A
Approach Delay		44.4		18.1			13.0
Approach LOS		D		B			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 21.6 — Intersection LOS: C
Intersection Capacity Utilization 135.2% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	351	0	622	0	0	0	0	1115	660	311	1520	0
Future Volume (veh/h)	351	0	622	0	0	0	0	1115	660	311	1520	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	249	0	712				0	1186	702	331	1617	0
Adj No. of Lanes	1	0	2				0	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	418	0	790				0	1551	692	400	2139	0
Arrive On Green	0.26	0.00	0.26				0.00	0.45	0.45	0.04	0.21	0.00
Sat Flow, veh/h	1619	0	3060				0	3510	1526	3141	3510	0
Grp Volume(v), veh/h	249	0	712				0	1186	702	331	1617	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1526	1570	1710	0
Q Serve(g_s), s	12.1	0.0	20.2				0.0	26.1	40.8	9.4	40.0	0.0
Cycle Q Clear(g_c), s	12.1	0.0	20.2				0.0	26.1	40.8	9.4	40.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	418	0	790				0	1551	692	400	2139	0
V/C Ratio(X)	0.60	0.00	0.90				0.00	0.76	1.01	0.83	0.76	0.00
Avail Cap(c_a), veh/h	468	0	884				0	1551	692	419	2139	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.68	0.68	0.25	0.25	0.00
Uniform Delay (d), s/veh	29.3	0.0	32.3				0.0	20.6	24.6	42.1	29.3	0.0
Incr Delay (d2), s/veh	0.9	0.0	10.8				0.0	2.5	31.8	3.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	9.7				0.0	12.7	23.2	4.3	19.2	0.0
LnGrp Delay(d),s/veh	30.2	0.0	43.1				0.0	23.1	56.4	45.3	29.9	0.0
LnGrp LOS	C		D					C	F	D	C	
Approach Vol, veh/h		961						1888			1948	
Approach Delay, s/veh		39.7						35.5			32.5	
Approach LOS		D						D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.5	46.3		28.2		61.8		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	12.0	37.5		26.0		53.5		
Max Q Clear Time (g_c+I1), s	11.4	42.8		22.2		42.0		
Green Ext Time (p_c), s	0.0	0.0		1.0		11.3		

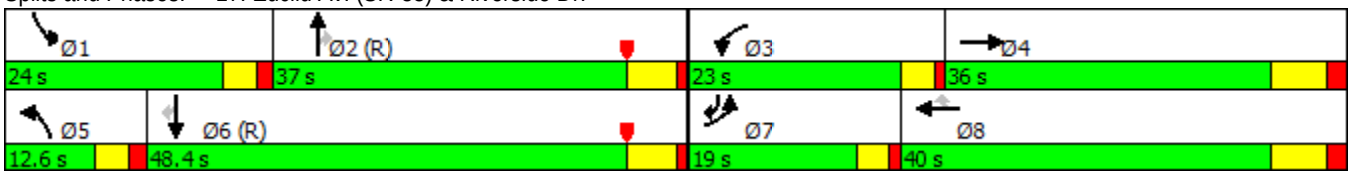
Intersection Summary	
HCM 2010 Ctrl Delay	35.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	150	344	182	404	53	66	1003	178	189	1086	156
Future Volume (vph)	150	344	182	404	53	66	1003	178	189	1086	156
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	19.0	36.0	23.0	40.0	40.0	12.6	37.0	37.0	24.0	48.4	19.0
Total Split (%)	15.8%	30.0%	19.2%	33.3%	33.3%	10.5%	30.8%	30.8%	20.0%	40.3%	15.8%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	14.0	21.6	17.1	24.7	24.7	9.4	41.5	41.5	18.9	53.2	72.6
Actuated g/C Ratio	0.12	0.18	0.14	0.21	0.21	0.08	0.35	0.35	0.16	0.44	0.60
v/c Ratio	0.84	0.69	0.84	0.60	0.13	0.55	0.62	0.29	0.79	0.53	0.17
Control Delay	86.9	50.0	79.2	46.3	0.6	60.5	31.6	11.3	47.6	17.3	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.9	50.0	79.2	46.3	0.6	60.5	31.6	11.3	47.6	17.3	6.5
LOS	F	D	E	D	A	E	C	B	D	B	A
Approach Delay		60.1		51.9			30.2			20.1	
Approach LOS		E		D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 68 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 34.3	Intersection LOS: C
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	344	55	182	404	53	66	1003	178	189	1086	156
Future Volume (veh/h)	150	344	55	182	404	53	66	1003	178	189	1086	156
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	158	362	35	192	425	51	69	1056	106	199	1143	98
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	182	546	52	216	666	297	86	1858	579	226	2284	883
Arrive On Green	0.11	0.17	0.17	0.13	0.19	0.19	0.02	0.12	0.12	0.05	0.15	0.15
Sat Flow, veh/h	1619	3149	303	1619	3420	1528	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	158	196	201	192	425	51	69	1056	106	199	1143	98
Grp Sat Flow(s),veh/h/ln	1619	1710	1741	1619	1710	1528	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	11.5	12.8	13.0	14.0	13.7	3.3	5.1	24.3	7.4	14.7	25.6	5.3
Cycle Q Clear(g_c), s	11.5	12.8	13.0	14.0	13.7	3.3	5.1	24.3	7.4	14.7	25.6	5.3
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	296	302	216	666	297	86	1858	579	226	2284	883
V/C Ratio(X)	0.87	0.66	0.67	0.89	0.64	0.17	0.80	0.57	0.18	0.88	0.50	0.11
Avail Cap(c_a), veh/h	202	413	421	256	941	420	109	1858	579	263	2284	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.66	0.66	0.66	0.53	0.53	0.53
Uniform Delay (d), s/veh	52.4	46.3	46.4	51.1	44.4	40.3	58.3	43.3	35.9	56.2	38.0	18.7
Incr Delay (d2), s/veh	26.9	3.5	3.6	24.0	1.5	0.4	19.2	0.8	0.5	14.8	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	6.3	6.6	7.7	6.6	1.4	2.7	11.2	3.2	7.5	11.7	2.3
LnGrp Delay(d),s/veh	79.3	49.8	50.0	75.1	45.9	40.6	77.5	44.1	36.4	71.0	38.4	18.9
LnGrp LOS	E	D	D	E	D	D	E	D	D	E	D	B
Approach Vol, veh/h		555			668			1231			1440	
Approach Delay, s/veh		58.3			53.9			45.3			41.6	
Approach LOS		E			D			D			D	

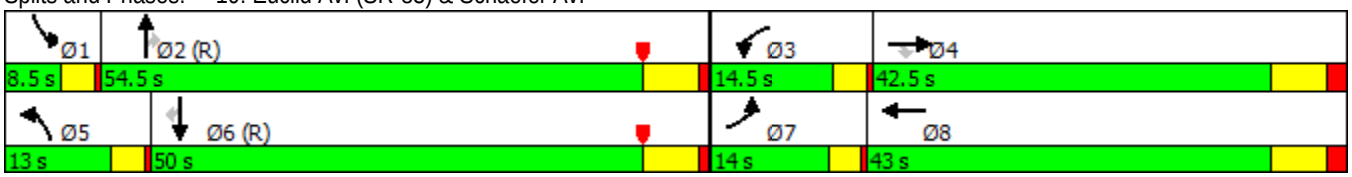
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.3	50.9	20.0	27.8	10.9	61.3	17.5	30.4
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	19.5	31.5	19.0	29.0	8.1	42.9	15.0	33.0
Max Q Clear Time (g_c+I1), s	16.7	26.3	16.0	15.0	7.1	27.6	13.5	15.7
Green Ext Time (p_c), s	0.1	4.5	0.1	5.6	0.0	11.7	0.0	6.3

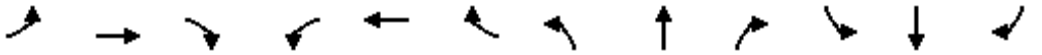
Intersection Summary	
HCM 2010 Ctrl Delay	47.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	63	118	58	123	122	1453	21	15	1630	137
Future Volume (vph)	145	63	118	58	123	122	1453	21	15	1630	137
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	42.5	42.5	14.5	43.0	13.0	54.5	54.5	8.5	50.0	50.0
Total Split (%)	11.7%	35.4%	35.4%	12.1%	35.8%	10.8%	45.4%	45.4%	7.1%	41.7%	41.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.6	21.8	21.8	10.3	17.8	15.0	70.4	70.4	5.4	55.6	55.6
Actuated g/C Ratio	0.10	0.18	0.18	0.09	0.15	0.12	0.59	0.59	0.04	0.46	0.46
v/c Ratio	0.99	0.20	0.33	0.45	0.56	0.65	0.54	0.02	0.22	0.76	0.19
Control Delay	123.8	42.7	8.6	62.7	51.6	40.9	21.6	2.2	83.8	11.4	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.8	42.7	8.6	62.7	51.6	40.9	21.6	2.2	83.8	11.4	0.7
LOS	F	D	A	E	D	D	C	A	F	B	A
Approach Delay		66.3			54.9		22.8			11.2	
Approach LOS		E			D		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 22.8	Intersection LOS: C
Intersection Capacity Utilization 75.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	63	118	58	123	18	122	1453	21	15	1630	137
Future Volume (veh/h)	145	63	118	58	123	18	122	1453	21	15	1630	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	154	67	74	62	131	17	130	1546	17	16	1734	98
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	142	219	186	118	167	22	128	3056	951	28	2752	837
Arrive On Green	0.09	0.12	0.12	0.07	0.11	0.11	0.03	0.21	0.21	0.01	0.38	0.38
Sat Flow, veh/h	1619	1800	1530	1619	1562	203	1619	4914	1530	1619	4914	1494
Grp Volume(v), veh/h	154	67	74	62	0	148	130	1546	17	16	1734	98
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1638	1530	1619	1638	1494
Q Serve(g_s), s	10.5	4.1	5.4	4.4	0.0	9.8	9.5	33.5	1.1	1.2	34.7	5.1
Cycle Q Clear(g_c), s	10.5	4.1	5.4	4.4	0.0	9.8	9.5	33.5	1.1	1.2	34.7	5.1
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	142	219	186	118	0	188	128	3056	951	28	2752	837
V/C Ratio(X)	1.09	0.31	0.40	0.53	0.00	0.79	1.01	0.51	0.02	0.57	0.63	0.12
Avail Cap(c_a), veh/h	142	533	453	148	0	529	128	3056	951	67	2752	837
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.64	0.64	0.64	0.36	0.36	0.36
Uniform Delay (d), s/veh	54.8	48.1	48.7	53.6	0.0	52.3	58.4	31.3	18.5	58.9	27.3	18.1
Incr Delay (d2), s/veh	100.8	0.6	1.0	1.4	0.0	5.3	67.4	0.4	0.0	2.5	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	2.1	2.3	2.0	0.0	5.0	6.7	15.3	0.5	0.5	15.8	2.2
LnGrp Delay(d),s/veh	155.6	48.7	49.7	55.0	0.0	57.6	125.9	31.7	18.5	61.3	27.7	18.2
LnGrp LOS	F	D	D	D		E	F	C	B	E	C	B
Approach Vol, veh/h		295			210			1693			1848	
Approach Delay, s/veh		104.7			56.8			38.8			27.5	
Approach LOS		F			E			D			C	

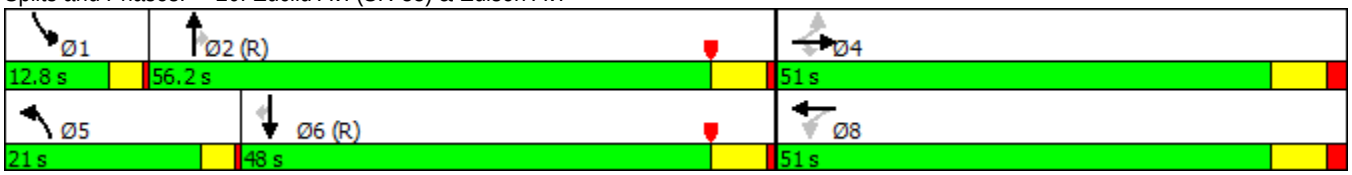
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	80.6	12.2	21.6	13.0	73.2	14.0	19.8
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	48.5	11.0	35.5	9.5	44.0	10.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	35.5	6.4	7.4	11.5	36.7	12.5	11.8
Green Ext Time (p_c), s	0.0	12.1	0.0	1.0	0.0	7.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	222	172	227	69	356	253	1297	38	42	1464	257
Future Volume (vph)	222	172	227	69	356	253	1297	38	42	1464	257
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	21.0	56.2	56.2	12.8	48.0	48.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	17.5%	46.8%	46.8%	10.7%	40.0%	40.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.2	44.2	44.2	44.2	44.2	17.5	53.5	53.5	7.5	41.8	41.8
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.15	0.45	0.45	0.06	0.35	0.35
v/c Ratio	1.16	0.28	0.34	0.19	0.65	1.14	0.63	0.06	0.45	0.91	0.42
Control Delay	148.5	28.2	4.6	27.6	36.7	139.7	17.8	1.4	80.1	30.8	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.5	28.2	4.6	27.6	36.7	139.7	17.8	1.4	80.1	30.8	9.6
LOS	F	C	A	C	D	F	B	A	F	C	A
Approach Delay		62.6			35.4		36.8			28.9	
Approach LOS		E			D		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.16	
Intersection Signal Delay: 37.1	Intersection LOS: D
Intersection Capacity Utilization 102.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	172	227	69	356	41	253	1297	38	42	1464	257
Future Volume (veh/h)	222	172	227	69	356	41	253	1297	38	42	1464	257
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	236	183	174	73	379	42	269	1380	25	45	1557	242
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	216	660	561	350	584	65	236	2267	706	56	1720	535
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.29	0.92	0.92	0.03	0.35	0.35
Sat Flow, veh/h	926	1800	1530	983	1592	176	1619	4914	1530	1619	4914	1528
Grp Volume(v), veh/h	236	183	174	73	0	421	269	1380	25	45	1557	242
Grp Sat Flow(s),veh/h/ln	926	1800	1530	983	0	1769	1619	1638	1530	1619	1638	1528
Q Serve(g_s), s	20.3	8.6	9.8	6.8	0.0	23.7	17.5	5.9	0.2	3.3	36.2	14.7
Cycle Q Clear(g_c), s	44.0	8.6	9.8	15.4	0.0	23.7	17.5	5.9	0.2	3.3	36.2	14.7
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	216	660	561	350	0	649	236	2267	706	56	1720	535
V/C Ratio(X)	1.09	0.28	0.31	0.21	0.00	0.65	1.14	0.61	0.04	0.81	0.91	0.45
Avail Cap(c_a), veh/h	216	660	561	350	0	649	236	2267	706	125	1720	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.74	0.74	0.74	0.62	0.62	0.62
Uniform Delay (d), s/veh	52.7	26.8	27.2	32.2	0.0	31.6	42.5	2.7	2.5	57.5	37.1	30.1
Incr Delay (d2), s/veh	87.4	0.2	0.3	0.3	0.0	2.3	93.6	0.9	0.1	6.2	5.5	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	4.3	4.2	1.9	0.0	12.0	13.9	2.5	0.1	1.6	17.2	6.4
LnGrp Delay(d),s/veh	140.1	27.0	27.5	32.5	0.0	33.9	136.1	3.6	2.6	63.8	42.6	31.8
LnGrp LOS	F	C	C	C		C	F	A	A	E	D	C
Approach Vol, veh/h		593			494			1674			1844	
Approach Delay, s/veh		72.2			33.7			24.9			41.7	
Approach LOS		E			C			C			D	

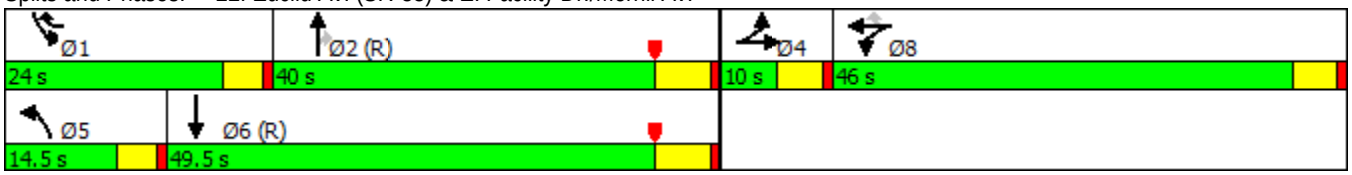
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	61.4		51.0	21.0	48.0		51.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.3	50.2		44.0	17.5	42.0		44.0
Max Q Clear Time (g_c+I1), s	5.3	7.9		46.0	19.5	38.2		25.7
Green Ext Time (p_c), s	0.0	32.0		0.0	0.0	3.7		5.4

Intersection Summary		
HCM 2010 Ctrl Delay		38.7
HCM 2010 LOS		D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	6	49	622	20	1062	186	484	1437
Future Volume (vph)	6	49	622	20	1062	186	484	1437
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	24.0	14.5	40.0	40.0	24.0	49.5
Total Split (%)	8.3%	38.3%	20.0%	12.1%	33.3%	33.3%	20.0%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.1	35.7	57.9	10.0	43.1	43.1	21.7	63.5
Actuated g/C Ratio	0.04	0.30	0.48	0.08	0.36	0.36	0.18	0.53
v/c Ratio	0.24	0.90	0.82	0.16	0.61	0.30	0.86	0.60
Control Delay	54.5	61.5	28.3	44.6	30.2	14.0	46.4	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	61.5	28.3	44.6	30.2	14.0	46.4	38.5
LOS	D	E	C	D	C	B	D	D
Approach Delay	54.5	42.1			28.0			40.4
Approach LOS	D	D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 27.7 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 37.3	Intersection LOS: D
Intersection Capacity Utilization 84.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	394	49	622	20	1062	186	484	1437	45
Future Volume (veh/h)	8	6	4	394	49	622	20	1062	186	484	1437	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1872	1800	1768	1800	1800
Adj Flow Rate, veh/h	8	6	3	410	51	602	21	1106	168	504	1497	44
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	14	11	5	524	65	764	68	1569	470	531	2098	62
Arrive On Green	0.02	0.02	0.02	0.34	0.34	0.34	0.04	0.31	0.31	0.16	0.43	0.43
Sat Flow, veh/h	803	602	301	1533	191	1509	1619	5111	1530	3267	4906	144
Grp Volume(v), veh/h	17	0	0	461	0	602	21	1106	168	504	1000	541
Grp Sat Flow(s),veh/h/ln	1707	0	0	1723	0	1509	1619	1704	1530	1633	1638	1775
Q Serve(g_s), s	1.2	0.0	0.0	28.8	0.0	39.5	1.5	23.0	10.3	18.3	30.2	30.2
Cycle Q Clear(g_c), s	1.2	0.0	0.0	28.8	0.0	39.5	1.5	23.0	10.3	18.3	30.2	30.2
Prop In Lane	0.47		0.18	0.89		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	31	0	0	589	0	764	68	1569	470	531	1401	759
V/C Ratio(X)	0.55	0.00	0.00	0.78	0.00	0.79	0.31	0.70	0.36	0.95	0.71	0.71
Avail Cap(c_a), veh/h	71	0	0	589	0	764	135	1569	470	531	1401	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.85	0.85	0.85	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	35.5	0.0	24.5	55.8	36.8	32.4	49.8	28.3	28.3
Incr Delay (d2), s/veh	5.6	0.0	0.0	6.2	0.0	5.1	0.8	2.3	1.8	26.6	3.1	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	14.7	0.0	17.4	0.7	11.1	4.6	10.2	14.2	15.9
LnGrp Delay(d),s/veh	64.1	0.0	0.0	41.7	0.0	29.6	56.6	39.1	34.2	76.4	31.4	34.0
LnGrp LOS	E			D		C	E	D	C	E	C	C
Approach Vol, veh/h		17			1063			1295			2045	
Approach Delay, s/veh		64.1			34.9			38.7			43.2	
Approach LOS		E			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	24.0	42.8		7.2	9.5	57.3		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	19.5	34.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	20.3	25.0		3.2	3.5	32.2		41.5
Green Ext Time (p_c), s	0.0	7.9		0.0	0.0	9.7		0.0

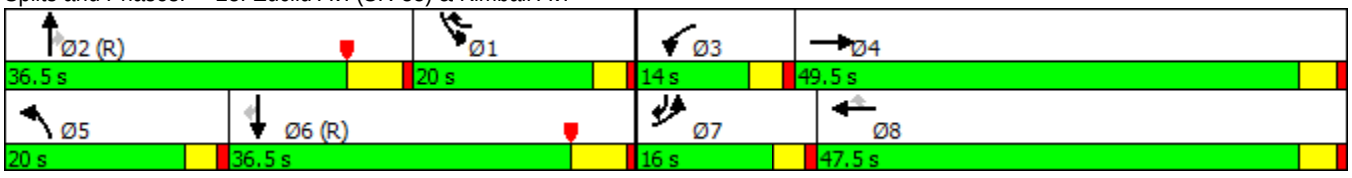
Intersection Summary	
HCM 2010 Ctrl Delay	40.0
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	282	326	129	596	131	176	797	189	336	738	635
Future Volume (vph)	282	326	129	596	131	176	797	189	336	738	635
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	1	5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	9.0	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	16.0	49.5	14.0	47.5	20.0	20.0	36.5	36.5	20.0	36.5	16.0
Total Split (%)	13.3%	41.3%	11.7%	39.6%	16.7%	16.7%	30.4%	30.4%	16.7%	30.4%	13.3%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	18.4	33.6	13.2	28.4	45.6	17.0	38.0	38.0	16.7	37.7	58.1
Actuated g/C Ratio	0.15	0.28	0.11	0.24	0.38	0.14	0.32	0.32	0.14	0.31	0.48
v/c Ratio	0.60	0.40	0.75	0.75	0.21	0.79	0.52	0.31	0.78	0.49	0.81
Control Delay	54.8	34.5	77.6	48.1	4.3	54.4	30.6	12.2	60.9	33.8	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	34.5	77.6	48.1	4.3	54.4	30.6	12.2	60.9	33.8	33.9
LOS	D	C	E	D	A	D	C	B	E	C	C
Approach Delay		43.3		45.8			31.2			39.2	
Approach LOS		D		D			C			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 39.0 — Intersection LOS: D
Intersection Capacity Utilization 80.2% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	282	326	46	129	596	131	176	797	189	336	738	635
Future Volume (veh/h)	282	326	46	129	596	131	176	797	189	336	738	635
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	288	333	45	132	608	112	180	813	185	343	753	610
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	314	725	97	135	761	795	206	1031	321	932	1947	752
Arrive On Green	0.10	0.24	0.24	0.08	0.22	0.22	0.04	0.07	0.07	0.30	0.40	0.40
Sat Flow, veh/h	3141	3032	406	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	288	187	191	132	608	112	180	813	185	343	753	610
Grp Sat Flow(s),veh/h/ln	1570	1710	1728	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	10.9	11.2	11.4	9.8	20.2	1.3	13.3	19.5	11.1	10.3	13.1	40.9
Cycle Q Clear(g_c), s	10.9	11.2	11.4	9.8	20.2	1.3	13.3	19.5	11.1	10.3	13.1	40.9
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	314	409	413	135	761	795	206	1031	321	932	1947	752
V/C Ratio(X)	0.92	0.46	0.46	0.98	0.80	0.14	0.87	0.79	0.58	0.37	0.39	0.81
Avail Cap(c_a), veh/h	314	641	648	135	1226	1002	216	1249	389	932	1947	752
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.71	0.71	0.71	0.68	0.68	0.68
Uniform Delay (d), s/veh	53.5	39.0	39.1	54.9	44.1	5.5	56.5	53.2	31.6	33.3	25.8	25.5
Incr Delay (d2), s/veh	28.0	0.7	0.7	70.4	0.7	0.0	21.9	4.5	5.3	0.1	0.4	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	5.4	5.5	7.0	9.6	1.0	7.2	9.3	5.2	4.5	6.0	18.4
LnGrp Delay(d),s/veh	81.5	39.7	39.8	125.3	44.9	5.5	78.4	57.7	36.9	33.4	26.2	32.1
LnGrp LOS	F	D	D	F	D	A	E	E	D	C	C	C
Approach Vol, veh/h		666			852			1178			1706	
Approach Delay, s/veh		57.8			52.1			57.6			29.7	
Approach LOS		E			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	41.6	31.2	14.0	33.2	19.2	53.5	16.0	31.2
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.0	* 31	10.0	45.0	16.0	30.5	12.0	43.0
Max Q Clear Time (g_c+I1), s	12.3	21.5	11.8	13.4	15.3	42.9	12.9	22.2
Green Ext Time (p_c), s	2.4	3.6	0.0	4.9	0.0	0.0	0.0	4.5

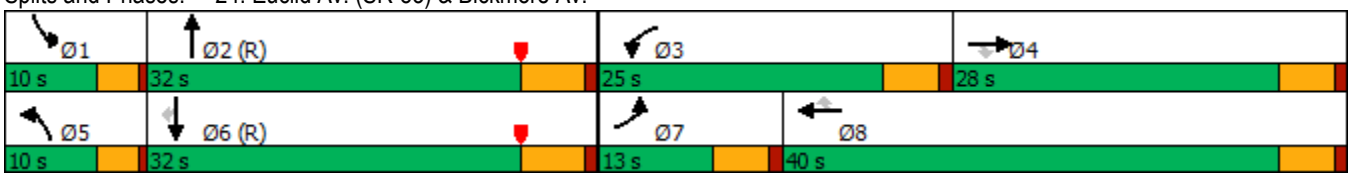
Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

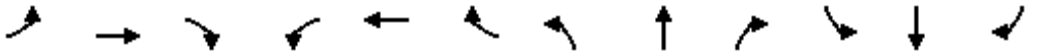
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	87	28	52	282	419	260	80	784	72	695	113
Future Volume (vph)	87	28	52	282	419	260	80	784	72	695	113
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	28.0	28.0	10.0	28.0	28.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	28.0	28.0	25.0	40.0	40.0	10.0	32.0	10.0	32.0	32.0
Total Split (%)	13.7%	29.5%	29.5%	26.3%	42.1%	42.1%	10.5%	33.7%	10.5%	33.7%	33.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	8.7	15.3	15.3	21.3	28.1	28.1	8.2	35.5	7.7	33.2	33.2
Actuated g/C Ratio	0.09	0.16	0.16	0.22	0.30	0.30	0.09	0.37	0.08	0.35	0.35
v/c Ratio	0.63	0.10	0.14	0.83	0.84	0.45	0.61	0.48	0.59	0.43	0.18
Control Delay	61.7	31.2	0.7	56.0	45.3	7.3	62.4	26.8	61.7	27.0	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	31.2	0.7	56.0	45.3	7.3	62.4	26.8	61.7	27.0	1.8
LOS	E	C	A	E	D	A	E	C	E	C	A
Approach Delay		37.7			38.2			30.0		26.6	
Approach LOS		D			D			C		C	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 32.1	Intersection LOS: C
Intersection Capacity Utilization 66.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	28	52	282	419	260	80	784	40	72	695	113
Future Volume (veh/h)	87	28	52	282	419	260	80	784	40	72	695	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	93	30	53	300	446	264	85	834	42	77	739	111
Adj No. of Lanes	1	1	1	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	125	272	231	328	498	423	105	1854	93	96	1872	583
Arrive On Green	0.08	0.15	0.15	0.20	0.28	0.28	0.07	0.39	0.39	0.06	0.38	0.38
Sat Flow, veh/h	1619	1800	1527	1619	1800	1530	1619	4793	241	1619	4914	1530
Grp Volume(v), veh/h	93	30	53	300	446	264	85	569	307	77	739	111
Grp Sat Flow(s),veh/h/ln	1619	1800	1527	1619	1800	1530	1619	1638	1758	1619	1638	1530
Q Serve(g_s), s	5.3	1.4	2.9	17.2	22.6	14.3	4.9	12.3	12.3	4.5	10.4	4.6
Cycle Q Clear(g_c), s	5.3	1.4	2.9	17.2	22.6	14.3	4.9	12.3	12.3	4.5	10.4	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	125	272	231	328	498	423	105	1267	680	96	1872	583
V/C Ratio(X)	0.74	0.11	0.23	0.91	0.90	0.62	0.81	0.45	0.45	0.80	0.39	0.19
Avail Cap(c_a), veh/h	136	436	370	341	663	564	111	1267	680	111	1872	583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.13	0.13	0.13	0.84	0.84	0.84
Uniform Delay (d), s/veh	42.9	34.8	35.5	37.1	33.0	30.0	43.8	21.6	21.6	44.1	21.4	19.6
Incr Delay (d2), s/veh	15.2	0.1	0.2	26.8	10.1	0.6	5.0	0.2	0.3	22.6	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.7	1.2	10.1	12.7	6.1	2.3	5.6	6.0	2.6	4.8	2.0
LnGrp Delay(d),s/veh	58.1	34.9	35.6	63.8	43.2	30.6	48.9	21.8	21.9	66.8	22.0	20.2
LnGrp LOS	E	C	D	E	D	C	D	C	C	E	C	C
Approach Vol, veh/h		176			1010			961			927	
Approach Delay, s/veh		47.4			46.0			24.2			25.5	
Approach LOS		D			D			C			C	

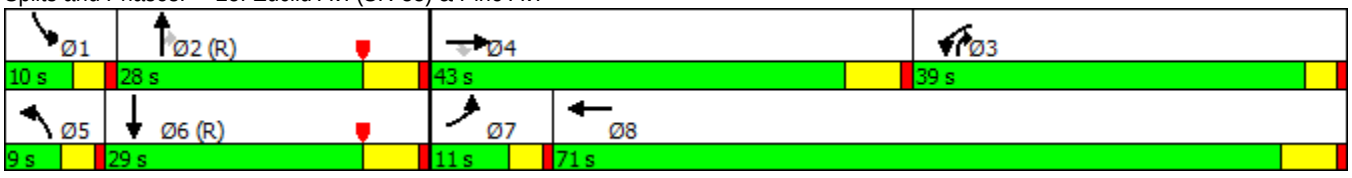
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.1	42.3	24.3	19.4	9.7	41.7	12.3	31.3
Change Period (Y+Rc), s	3.5	5.5	5.0	5.0	3.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	6.5	26.5	20.0	23.0	6.5	26.5	8.0	35.0
Max Q Clear Time (g_c+I1), s	6.5	14.3	19.2	4.9	6.9	12.4	7.3	24.6
Green Ext Time (p_c), s	0.0	2.6	0.0	0.1	0.0	2.6	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	33.1
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	227	34	915	173	60	888	516	84	923
Future Volume (vph)	5	227	34	915	173	60	888	516	84	923
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	11.0	43.0	43.0	39.0	71.0	9.0	28.0	39.0	10.0	29.0
Total Split (%)	9.2%	35.8%	35.8%	32.5%	59.2%	7.5%	23.3%	32.5%	8.3%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.3	23.2	23.2	45.0	70.2	7.3	22.2	69.2	9.6	24.5
Actuated g/C Ratio	0.04	0.19	0.19	0.38	0.58	0.06	0.18	0.58	0.08	0.20
v/c Ratio	0.07	0.66	0.09	0.84	0.27	0.62	0.99	0.50	0.66	0.95
Control Delay	57.0	52.6	0.4	42.8	11.4	77.3	55.9	2.6	65.5	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	52.6	0.4	42.8	11.4	77.3	55.9	2.6	65.5	50.1
LOS	E	D	A	D	B	E	E	A	E	D
Approach Delay		46.1			35.7		38.0			51.4
Approach LOS		D			D		D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 40 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 41.3	Intersection LOS: D
Intersection Capacity Utilization 83.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	227	34	915	173	95	60	888	516	84	923	15
Future Volume (veh/h)	5	227	34	915	173	95	60	888	516	84	923	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	229	0	924	175	81	61	897	343	85	932	10
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	275	234	862	528	244	67	1583	928	81	1656	18
Arrive On Green	0.01	0.15	0.00	0.29	0.45	0.45	0.04	0.32	0.32	0.02	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	1160	537	1619	4914	1496	1619	5011	54
Grp Volume(v), veh/h	5	229	0	924	0	256	61	897	343	85	609	333
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1697	1619	1638	1496	1619	1638	1789
Q Serve(g_s), s	0.4	14.8	0.0	35.0	0.0	11.6	4.5	18.2	3.0	6.0	21.2	21.2
Cycle Q Clear(g_c), s	0.4	14.8	0.0	35.0	0.0	11.6	4.5	18.2	3.0	6.0	21.2	21.2
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	275	234	862	0	772	67	1583	928	81	1082	591
V/C Ratio(X)	0.48	0.83	0.00	1.07	0.00	0.33	0.90	0.57	0.37	1.05	0.56	0.56
Avail Cap(c_a), veh/h	94	555	472	862	0	919	67	1583	928	81	1082	591
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.26	0.26	0.26	0.79	0.79	0.79
Uniform Delay (d), s/veh	59.4	49.3	0.0	42.5	0.0	21.0	57.3	33.7	3.7	59.0	45.2	45.2
Incr Delay (d2), s/veh	12.4	8.9	0.0	51.7	0.0	0.4	31.0	0.4	0.3	102.9	1.7	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.1	0.0	20.4	0.0	5.5	2.6	8.3	2.9	5.0	9.9	11.0
LnGrp Delay(d),s/veh	71.8	58.2	0.0	94.2	0.0	21.4	88.3	34.1	4.0	163.0	46.9	48.3
LnGrp LOS	E	E		F		C	F	C	A	F	D	D
Approach Vol, veh/h		234			1180			1301			1027	
Approach Delay, s/veh		58.5			78.4			28.7			57.0	
Approach LOS		E			E			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	44.6	41.0	24.4	9.0	45.6	4.8	60.6
Change Period (Y+Rc), s	4.0	6.0	6.0	* 6	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	22.0	35.0	* 37	5.0	23.0	7.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	20.2	37.0	16.8	6.5	23.2	2.4	13.6
Green Ext Time (p_c), s	0.0	1.4	0.0	1.5	0.0	0.0	0.0	3.9

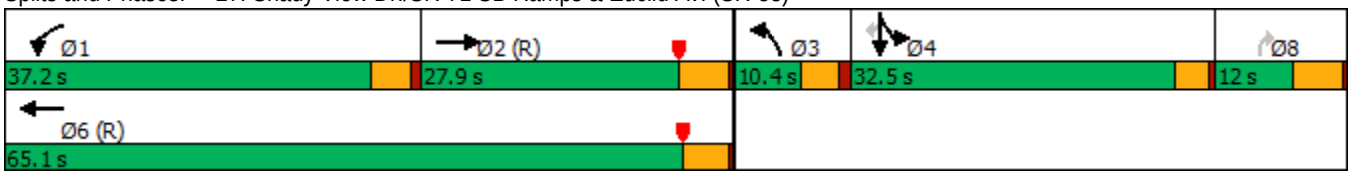
Intersection Summary	
HCM 2010 Ctrl Delay	54.0
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	834	412	251	64	312	282	22	37
Future Volume (vph)	834	412	251	64	312	282	22	37
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	27.9	37.2	65.1	10.4	12.0	32.5	32.5	32.5
Total Split (%)	23.3%	31.0%	54.3%	8.7%	10.0%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	26.2	39.6	70.8	5.9	7.2	18.6	18.6	18.6
Actuated g/C Ratio	0.22	0.33	0.59	0.05	0.06	0.16	0.16	0.16
v/c Ratio	1.26	0.85	0.14	0.89	0.83	0.64	0.09	0.11
Control Delay	165.2	28.6	4.9	130.3	23.2	52.9	41.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	165.2	28.6	4.9	130.3	23.2	52.9	41.0	0.6
LOS	F	C	A	F	C	D	D	A
Approach Delay	165.2		19.6				46.4	
Approach LOS	F		B				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 93.7 (78%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 82.9	Intersection LOS: F
Intersection Capacity Utilization 73.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	834	17	412	251	0	64	0	312	282	22	37
Future Volume (veh/h)	0	834	17	412	251	0	64	0	312	282	22	37
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	916	19	453	276	0	70	0	343	310	24	41
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1703	35	441	2760	0	0	0	0	384	220	187
Arrive On Green	0.00	0.50	0.50	0.46	1.00	0.00	0.00	0.00	0.00	0.12	0.12	0.12
Sat Flow, veh/h	0	3516	71	1619	3510	0		0		3141	1800	1530
Grp Volume(v), veh/h	0	457	478	453	276	0		0.0		310	24	41
Grp Sat Flow(s),veh/h/ln	0	1710	1787	1619	1710	0				1570	1800	1530
Q Serve(g_s), s	0.0	22.0	22.0	32.7	0.0	0.0				11.5	1.4	2.9
Cycle Q Clear(g_c), s	0.0	22.0	22.0	32.7	0.0	0.0				11.5	1.4	2.9
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	850	888	441	2760	0				384	220	187
V/C Ratio(X)	0.00	0.54	0.54	1.03	0.10	0.00				0.81	0.11	0.22
Avail Cap(c_a), veh/h	0	850	888	441	2760	0				759	435	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	20.7	20.7	32.7	0.0	0.0				51.3	46.9	47.5
Incr Delay (d2), s/veh	0.0	2.4	2.3	49.9	0.1	0.0				4.1	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.0	11.5	20.6	0.0	0.0				5.2	0.7	1.3
LnGrp Delay(d),s/veh	0.0	23.2	23.1	82.6	0.1	0.0				55.4	47.1	48.1
LnGrp LOS		C	C	F	A					E	D	D
Approach Vol, veh/h		935			729						375	
Approach Delay, s/veh		23.1			51.3						54.0	
Approach LOS		C			D						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	37.2	64.6		18.2		101.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	32.7	22.9		29.0		* 61		
Max Q Clear Time (g_c+I1), s	34.7	24.0		13.5		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.1		1.4		

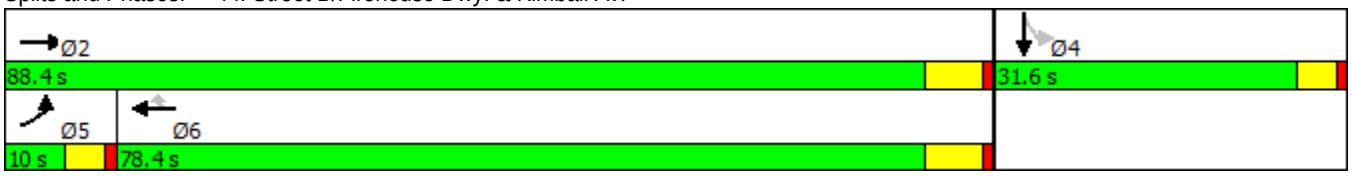
Intersection Summary	
HCM 2010 Ctrl Delay	38.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	SBT
Lane Configurations				
Traffic Volume (vph)	3	953	1353	0
Future Volume (vph)	3	953	1353	0
Turn Type	Prot	NA	NA	NA
Protected Phases	5	2	6	4
Permitted Phases				
Detector Phase	5	2	6	4
Switch Phase				
Minimum Initial (s)	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	23.2	31.6
Total Split (s)	10.0	88.4	78.4	31.6
Total Split (%)	8.3%	73.7%	65.3%	26.3%
Yellow Time (s)	3.6	5.2	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	Max	Max	None
Act Effct Green (s)	5.1	100.0	98.2	13.1
Actuated g/C Ratio	0.05	0.94	0.92	0.12
v/c Ratio	0.04	0.33	0.47	0.00
Control Delay	52.7	2.6	5.2	39.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.7	2.6	5.2	39.0
LOS	D	A	A	D
Approach Delay		2.7	5.2	39.0
Approach LOS		A	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 106.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	953	0	0	1353	0	0	0	0	1	0	0
Future Volume (veh/h)	3	953	0	0	1353	0	0	0	0	1	0	0
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	3	1047	0	0	1487	0				1	0	0
Adj No. of Lanes	1	2	0	0	2	1				0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	6	3015	0	0	2832	1267				5	0	0
Arrive On Green	0.00	0.88	0.00	0.00	0.83	0.00				0.00	0.00	0.00
Sat Flow, veh/h	1619	3510	0	0	3510	1530				1714	0	0
Grp Volume(v), veh/h	3	1047	0	0	1487	0				1	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530				1714	0	0
Q Serve(g_s), s	0.2	4.9	0.0	0.0	12.3	0.0				0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.2	4.9	0.0	0.0	12.3	0.0				0.1	0.0	0.0
Prop In Lane	1.00		0.00	0.00		1.00				1.00		0.00
Lane Grp Cap(c), veh/h	6	3015	0	0	2832	1267				5	0	0
V/C Ratio(X)	0.46	0.35	0.00	0.00	0.53	0.00				0.21	0.00	0.00
Avail Cap(c_a), veh/h	94	3015	0	0	2832	1267				496	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	46.3	0.9	0.0	0.0	2.4	0.0				46.4	0.0	0.0
Incr Delay (d2), s/veh	17.8	0.3	0.0	0.0	0.7	0.0				21.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.3	0.0	0.0	5.9	0.0				0.1	0.0	0.0
LnGrp Delay(d),s/veh	64.2	1.3	0.0	0.0	3.1	0.0				67.5	0.0	0.0
LnGrp LOS	E	A			A					E		
Approach Vol, veh/h		1050			1487						1	
Approach Delay, s/veh		1.4			3.1						67.5	
Approach LOS		A			A						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		88.4		4.9	5.0	83.4		
Change Period (Y+Rc), s		6.2		4.6	4.6	6.2		
Max Green Setting (Gmax), s		82.2		27.0	5.4	72.2		
Max Q Clear Time (g_c+I1), s		6.9		2.1	2.2	14.3		
Green Ext Time (p_c), s		36.9		0.0	0.0	32.6		

Intersection Summary	
HCM 2010 Ctrl Delay	2.5
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	400	413	5	471	20	20	97	13
Future Volume (vph)	400	413	5	471	20	20	97	13
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	31.0	48.8	9.6	27.4	31.6	31.6	31.6	31.6
Total Split (%)	34.4%	54.2%	10.7%	30.4%	35.1%	35.1%	35.1%	35.1%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	23.9	46.0	5.1	19.2		22.2		22.2
Actuated g/C Ratio	0.30	0.57	0.06	0.24		0.27		0.27
v/c Ratio	0.89	0.23	0.05	0.81		0.15		0.81
Control Delay	51.0	10.2	41.4	39.7		24.3		46.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	51.0	10.2	41.4	39.7		24.3		46.0
LOS	D	B	D	D		C		D
Approach Delay		30.0		39.7		24.3		46.0
Approach LOS		C		D		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 81	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 35.8	Intersection LOS: D
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	413	12	5	471	126	20	20	18	97	13	193
Future Volume (veh/h)	400	413	12	5	471	126	20	20	18	97	13	193
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	421	435	13	5	496	133	21	21	19	102	14	203
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	461	1779	53	11	656	175	160	154	111	169	36	242
Arrive On Green	0.28	0.53	0.53	0.01	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1619	3388	101	1619	2657	708	366	610	442	405	144	961
Grp Volume(v), veh/h	421	219	229	5	318	311	61	0	0	319	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1779	1619	1710	1655	1419	0	0	1510	0	0
Q Serve(g_s), s	17.9	5.0	5.0	0.2	12.2	12.4	0.0	0.0	0.0	11.5	0.0	0.0
Cycle Q Clear(g_c), s	17.9	5.0	5.0	0.2	12.2	12.4	2.0	0.0	0.0	14.2	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.43	0.34		0.31	0.32		0.64
Lane Grp Cap(c), veh/h	461	898	934	11	422	409	425	0	0	447	0	0
V/C Ratio(X)	0.91	0.24	0.24	0.47	0.75	0.76	0.14	0.00	0.00	0.71	0.00	0.00
Avail Cap(c_a), veh/h	601	1024	1065	114	509	493	611	0	0	637	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.6	9.2	9.2	35.2	24.8	24.8	20.7	0.0	0.0	25.1	0.0	0.0
Incr Delay (d2), s/veh	13.7	0.1	0.1	11.3	5.1	5.6	0.2	0.0	0.0	2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	2.3	2.5	0.1	6.3	6.3	1.0	0.0	0.0	6.2	0.0	0.0
LnGrp Delay(d),s/veh	38.3	9.3	9.3	46.5	29.9	30.4	20.8	0.0	0.0	27.3	0.0	0.0
LnGrp LOS	D	A	A	D	C	C	C			C		
Approach Vol, veh/h		869			634			61			319	
Approach Delay, s/veh		23.4			30.3			20.8			27.3	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	43.6		22.5	24.9	23.8		22.5
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	42.6		27.0	26.4	21.2		27.0
Max Q Clear Time (g_c+I1), s	2.2	7.0		16.2	19.9	14.4		4.0
Green Ext Time (p_c), s	0.0	6.6		1.6	0.4	3.2		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	232	196	298	473	123	260
Future Volume (vph)	232	196	298	473	123	260
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	24.0	56.8	32.8	32.8
Total Split (%)	36.9%	36.9%	26.7%	63.1%	36.4%	36.4%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	15.6	14.0	17.8	35.7	13.1	13.1
Actuated g/C Ratio	0.25	0.23	0.29	0.57	0.21	0.21
v/c Ratio	0.61	0.42	0.69	0.49	0.35	0.52
Control Delay	28.8	6.4	32.4	10.5	25.1	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	6.4	32.4	10.5	25.1	7.0
LOS	C	A	C	B	C	A
Approach Delay				19.0	12.8	
Approach LOS				B	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 62.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 53.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	232	0	196	0	0	0	298	473	0	0	123	260
Future Volume (veh/h)	232	0	196	0	0	0	298	473	0	0	123	260
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	249	0	211				320	509	0	0	132	280
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	318	0	301				375	1084	0	0	508	432
Arrive On Green	0.20	0.00	0.20				0.23	0.60	0.00	0.00	0.28	0.28
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1530
Grp Volume(v), veh/h	249	0	211				320	509	0	0	132	280
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1530
Q Serve(g_s), s	7.6	0.0	6.6				9.8	8.1	0.0	0.0	2.9	8.3
Cycle Q Clear(g_c), s	7.6	0.0	6.6				9.8	8.1	0.0	0.0	2.9	8.3
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	318	0	301				375	1084	0	0	508	432
V/C Ratio(X)	0.78	0.00	0.70				0.85	0.47	0.00	0.00	0.26	0.65
Avail Cap(c_a), veh/h	895	0	846				607	1775	0	0	940	799
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	19.4				19.0	5.7	0.0	0.0	14.4	16.3
Incr Delay (d2), s/veh	1.6	0.0	1.1				3.5	0.3	0.0	0.0	0.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	5.5				4.7	4.1	0.0	0.0	1.5	7.1
LnGrp Delay(d),s/veh	21.3	0.0	20.5				22.5	6.0	0.0	0.0	14.7	18.0
LnGrp LOS	C		C				C	A			B	B
Approach Vol, veh/h		460						829			412	
Approach Delay, s/veh		20.9						12.4			16.9	
Approach LOS		C						B			B	

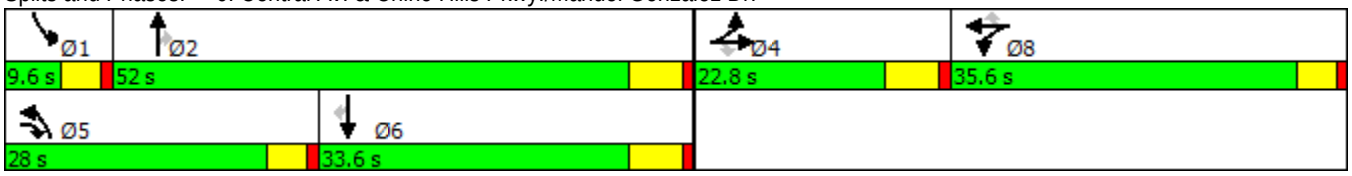
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		36.9		14.8	16.6	20.4		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		51.0		28.6	19.4	27.0		
Max Q Clear Time (g_c+I1), s		10.1		9.6	11.8	10.3		
Green Ext Time (p_c), s		5.1		0.6	0.3	4.3		

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	2	427	12	43	35	325	777	1	11	877	240
Future Volume (vph)	514	2	427	12	43	35	325	777	1	11	877	240
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	5	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	22.8	22.8	28.0	35.6	35.6	35.6	28.0	52.0	52.0	9.6	33.6	33.6
Total Split (%)	19.0%	19.0%	23.3%	29.7%	29.7%	29.7%	23.3%	43.3%	43.3%	8.0%	28.0%	28.0%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	17.2	17.2	43.2	13.6	13.6	13.6	23.7	54.9	54.9	5.1	28.2	28.2
Actuated g/C Ratio	0.17	0.17	0.43	0.14	0.14	0.14	0.24	0.55	0.55	0.05	0.28	0.28
v/c Ratio	1.06	1.01	0.50	0.06	0.19	0.11	0.93	0.45	0.00	0.15	0.99	0.49
Control Delay	115.1	100.6	3.2	37.7	40.4	0.7	71.1	17.4	0.0	54.5	65.2	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.1	100.6	3.2	37.7	40.4	0.7	71.1	17.4	0.0	54.5	65.2	17.8
LOS	F	F	A	D	D	A	E	B	A	D	E	B
Approach Delay		60.5			24.6			33.2			55.0	
Approach LOS		E			C			C			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 48.4	Intersection LOS: D
Intersection Capacity Utilization 81.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	514	2	427	12	43	35	325	777	1	11	877	240
Future Volume (veh/h)	514	2	427	12	43	35	325	777	1	11	877	240
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	560	0	336	13	47	21	353	845	1	12	953	191
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	561	0	624	157	174	147	379	1722	770	23	969	428
Arrive On Green	0.17	0.00	0.17	0.10	0.10	0.10	0.23	0.50	0.50	0.01	0.28	0.28
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	560	0	336	13	47	21	353	845	1	12	953	191
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	17.0	0.0	16.4	0.7	2.4	1.2	20.9	16.0	0.0	0.7	27.1	10.2
Cycle Q Clear(g_c), s	17.0	0.0	16.4	0.7	2.4	1.2	20.9	16.0	0.0	0.7	27.1	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	561	0	624	157	174	147	379	1722	770	23	969	428
V/C Ratio(X)	1.00	0.00	0.54	0.08	0.27	0.14	0.93	0.49	0.00	0.52	0.98	0.45
Avail Cap(c_a), veh/h	561	0	624	512	569	481	386	1722	770	83	969	428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.5	0.0	22.1	40.3	41.1	40.6	36.8	16.1	12.1	48.0	34.9	28.8
Incr Delay (d2), s/veh	37.4	0.0	0.9	0.2	0.8	0.4	28.2	1.0	0.0	6.6	25.1	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	0.0	7.1	0.3	1.2	0.5	12.3	7.8	0.0	0.4	16.2	4.6
LnGrp Delay(d),s/veh	77.9	0.0	23.0	40.5	41.9	41.0	65.0	17.1	12.1	54.6	60.0	32.2
LnGrp LOS	E		C	D	D	D	E	B	B	D	E	C
Approach Vol, veh/h		896			81			1199			1156	
Approach Delay, s/veh		57.3			41.4			31.2			55.4	
Approach LOS		E			D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	55.2		22.8	27.6	33.6		14.1
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	46.2		17.0	23.4	27.8		31.0
Max Q Clear Time (g_c+I1), s	2.7	18.0		19.0	22.9	29.1		4.4
Green Ext Time (p_c), s	0.0	19.9		0.0	0.0	0.0		0.3

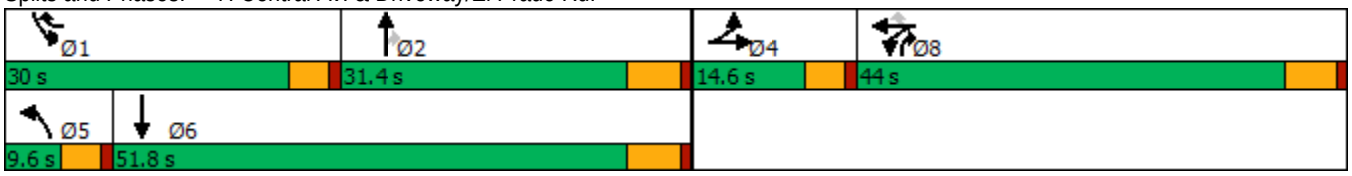
Intersection Summary	
HCM 2010 Ctrl Delay	46.8
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	27	5	750	4	471	9	595	848	588	738
Future Volume (vph)	27	5	750	4	471	9	595	848	588	738
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	44.0	44.0	30.0	9.6	31.4	44.0	30.0	51.8
Total Split (%)	12.2%	12.2%	36.7%	36.7%	25.0%	8.0%	26.2%	36.7%	25.0%	43.2%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.2	10.2	34.8	34.8	64.7	5.1	26.1	60.9	24.0	53.0
Actuated g/C Ratio	0.09	0.09	0.31	0.31	0.58	0.05	0.23	0.54	0.21	0.47
v/c Ratio	0.19	0.17	0.82	0.79	0.51	0.12	0.78	0.90	0.92	0.34
Control Delay	54.8	25.8	52.4	48.5	9.7	59.3	50.5	23.8	64.3	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	25.8	52.4	48.5	9.7	59.3	50.5	23.8	64.3	21.1
LOS	D	C	D	D	A	E	D	C	E	C
Approach Delay		40.5		34.8			35.0			40.0
Approach LOS		D		C			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 36.6	Intersection LOS: D
Intersection Capacity Utilization 95.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	5	21	750	4	471	9	595	848	588	738	18
Future Volume (veh/h)	27	5	21	750	4	471	9	595	848	588	738	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	28	5	13	784	0	340	9	620	707	612	769	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	113	31	81	909	0	757	18	822	792	671	2197	43
Arrive On Green	0.07	0.07	0.07	0.28	0.00	0.28	0.01	0.24	0.24	0.21	0.44	0.44
Sat Flow, veh/h	1619	443	1153	3238	0	1530	1619	3420	1508	3141	4960	97
Grp Volume(v), veh/h	28	0	18	784	0	340	9	620	707	612	508	276
Grp Sat Flow(s),veh/h/ln	1619	0	1597	1619	0	1530	1619	1710	1508	1570	1638	1781
Q Serve(g_s), s	1.7	0.0	1.1	24.5	0.0	15.4	0.6	17.9	25.6	20.3	10.9	10.9
Cycle Q Clear(g_c), s	1.7	0.0	1.1	24.5	0.0	15.4	0.6	17.9	25.6	20.3	10.9	10.9
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	113	0	111	909	0	757	18	822	792	671	1451	789
V/C Ratio(X)	0.25	0.00	0.16	0.86	0.00	0.45	0.51	0.75	0.89	0.91	0.35	0.35
Avail Cap(c_a), veh/h	152	0	150	1162	0	876	76	822	792	749	1451	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.9	0.0	46.6	36.3	0.0	17.5	52.4	37.5	18.3	40.9	19.5	19.6
Incr Delay (d2), s/veh	0.4	0.0	0.2	5.6	0.0	0.4	8.1	6.4	14.5	13.7	0.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	11.6	0.0	6.6	0.3	9.2	23.8	10.0	5.1	5.6
LnGrp Delay(d),s/veh	47.3	0.0	46.8	41.9	0.0	17.9	60.4	43.9	32.8	54.6	20.2	20.8
LnGrp LOS	D		D	D		B	E	D	C	D	C	C
Approach Vol, veh/h		46			1124			1336			1396	
Approach Delay, s/veh		47.1			34.6			38.1			35.4	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	27.3	31.4		12.0	5.8	53.0		35.7
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	25.4	25.6		10.0	5.0	46.0		38.2
Max Q Clear Time (g_c+I1), s	22.3	27.6		3.7	2.6	12.9		26.5
Green Ext Time (p_c), s	0.5	0.0		0.0	0.0	7.5		3.4

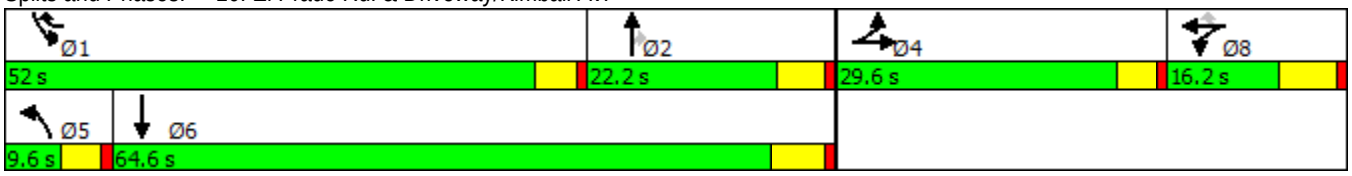
Intersection Summary	
HCM 2010 Ctrl Delay	36.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	37	9	3	855	4	210	25	1011	366
Future Volume (vph)	37	9	3	855	4	210	25	1011	366
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	52.0	9.6	22.2	22.2	52.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	43.3%	8.0%	18.5%	18.5%	43.3%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	14.3	14.3	12.2	43.1	6.1	17.2	17.2	35.6	45.9
Actuated g/C Ratio	0.18	0.18	0.15	0.53	0.08	0.21	0.21	0.44	0.57
v/c Ratio	0.14	0.06	0.11	0.83	0.03	0.58	0.06	0.77	0.39
Control Delay	40.2	28.9	46.2	14.0	51.5	45.1	0.2	27.5	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	28.9	46.2	14.0	51.5	45.1	0.2	27.5	14.8
LOS	D	C	D	B	D	D	A	C	B
Approach Delay		36.6	15.0			40.6			24.1
Approach LOS		D	B			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 81.1	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.8	Intersection LOS: C
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	9	9	24	3	855	4	210	25	1011	366	14
Future Volume (veh/h)	37	9	9	24	3	855	4	210	25	1011	366	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	39	9	7	25	3	449	4	221	25	1064	385	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	141	82	64	187	22	755	98	292	248	1168	816	30
Arrive On Green	0.09	0.09	0.09	0.12	0.12	0.12	0.06	0.16	0.16	0.37	0.47	0.47
Sat Flow, veh/h	1619	940	731	1538	185	1530	1619	1800	1530	3141	1726	63
Grp Volume(v), veh/h	39	0	16	28	0	449	4	221	25	1064	0	399
Grp Sat Flow(s),veh/h/ln	1619	0	1671	1723	0	1530	1619	1800	1530	1570	0	1789
Q Serve(g_s), s	1.9	0.0	0.7	1.2	0.0	10.0	0.2	9.6	1.1	26.5	0.0	12.4
Cycle Q Clear(g_c), s	1.9	0.0	0.7	1.2	0.0	10.0	0.2	9.6	1.1	26.5	0.0	12.4
Prop In Lane	1.00		0.44	0.89		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	141	0	145	209	0	755	98	292	248	1168	0	846
V/C Ratio(X)	0.28	0.00	0.11	0.13	0.00	0.59	0.04	0.76	0.10	0.91	0.00	0.47
Avail Cap(c_a), veh/h	492	0	508	209	0	755	98	372	316	1810	0	1279
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.1	0.0	34.6	32.3	0.0	14.9	36.4	32.9	29.4	24.5	0.0	14.7
Incr Delay (d2), s/veh	1.1	0.0	0.3	0.3	0.0	1.3	0.1	6.6	0.2	3.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.3	0.6	0.0	7.5	0.1	5.3	0.5	11.9	0.0	6.2
LnGrp Delay(d),s/veh	36.2	0.0	34.9	32.5	0.0	16.2	36.4	39.6	29.5	28.1	0.0	15.1
LnGrp LOS	D		C	C		B	D	D	C	C		B
Approach Vol, veh/h		55			477			250			1463	
Approach Delay, s/veh		35.8			17.2			38.5			24.5	
Approach LOS		D			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	35.2	19.1		11.8	9.6	44.7		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	47.4	* 17		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	28.5	11.6		3.9	2.2	14.4		12.0
Green Ext Time (p_c), s	2.1	1.7		0.1	0.0	3.9		0.0

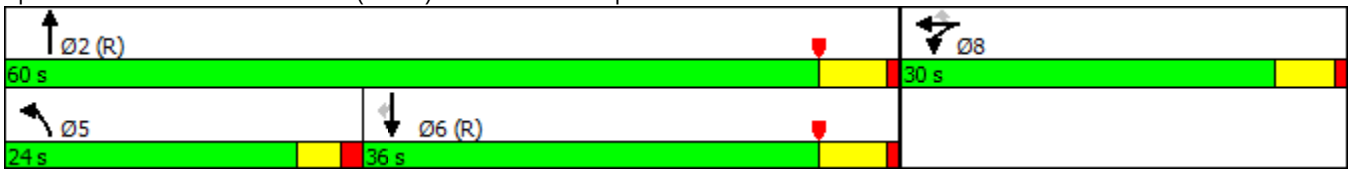
Intersection Summary	
HCM 2010 Ctrl Delay	24.8
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	651	6	431	533	1094	964	560
Future Volume (vph)	651	6	431	533	1094	964	560
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	24.0	60.0	36.0	36.0
Total Split (%)	33.3%	33.3%	33.3%	26.7%	66.7%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.4	24.4	24.4	18.5	55.1	32.1	32.1
Actuated g/C Ratio	0.27	0.27	0.27	0.21	0.61	0.36	0.36
v/c Ratio	0.95	0.92	0.79	0.87	0.55	0.83	0.65
Control Delay	67.8	58.9	37.6	41.1	18.7	34.6	5.8
Queue Delay	0.0	0.0	0.0	0.0	1.9	0.0	0.0
Total Delay	67.8	58.9	37.6	41.1	20.5	34.6	5.8
LOS	E	E	D	D	C	C	A
Approach Delay		55.3			27.3	24.0	
Approach LOS		E			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 51 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 33.3	Intersection LOS: C
Intersection Capacity Utilization 90.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	651	6	431	533	1094	0	0	964	560
Future Volume (veh/h)	0	0	0	651	6	431	533	1094	0	0	964	560
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				781	0	202	561	1152	0	0	1015	589
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				851	0	397	635	2122	0	0	1260	553
Arrive On Green				0.26	0.00	0.26	0.07	0.20	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3238	0	1510	3141	3510	0	0	3510	1500
Grp Volume(v), veh/h				781	0	202	561	1152	0	0	1015	589
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1570	1710	0	0	1710	1500
Q Serve(g_s), s				21.1	0.0	10.2	15.9	27.1	0.0	0.0	24.0	33.2
Cycle Q Clear(g_c), s				21.1	0.0	10.2	15.9	27.1	0.0	0.0	24.0	33.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				851	0	397	635	2122	0	0	1260	553
V/C Ratio(X)				0.92	0.00	0.51	0.88	0.54	0.00	0.00	0.81	1.07
Avail Cap(c_a), veh/h				899	0	420	681	2122	0	0	1260	553
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.49	0.49	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.2	0.0	28.2	41.0	24.4	0.0	0.0	25.5	28.4
Incr Delay (d2), s/veh				13.2	0.0	0.4	6.3	0.5	0.0	0.0	5.6	56.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.0	0.0	4.3	7.5	13.0	0.0	0.0	12.3	22.4
LnGrp Delay(d),s/veh				45.4	0.0	28.6	47.3	24.9	0.0	0.0	31.1	85.3
LnGrp LOS				D		C	D	C			C	F
Approach Vol, veh/h					983			1713			1604	
Approach Delay, s/veh					42.0			32.2			51.0	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		61.3			22.7	38.7		28.7
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		54.5			19.5	30.5		25.0
Max Q Clear Time (g_c+I1), s		29.1			17.9	35.2		23.1
Green Ext Time (p_c), s		22.6			0.2	0.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	41.4
HCM 2010 LOS	D

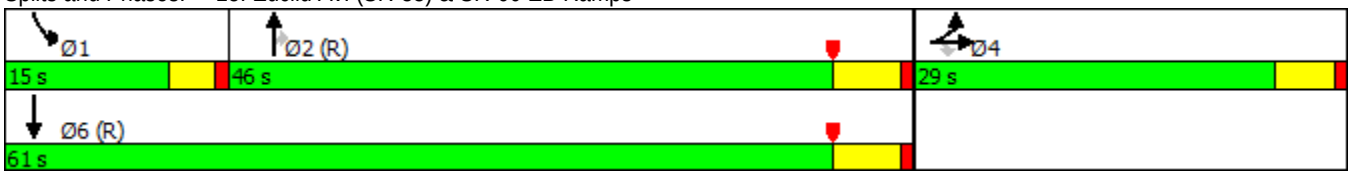
Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	400	2	559	1229	770	319	1297
Future Volume (vph)	400	2	559	1229	770	319	1297
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	29.0	46.0	46.0	15.0	61.0
Total Split (%)	32.2%	32.2%	32.2%	51.1%	51.1%	16.7%	67.8%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.3	22.3	22.3	42.0	42.0	11.1	57.2
Actuated g/C Ratio	0.25	0.25	0.25	0.47	0.47	0.12	0.64
v/c Ratio	0.89	0.81	0.76	0.79	0.72	0.84	0.61
Control Delay	59.1	42.2	35.9	25.1	6.1	50.1	2.6
Queue Delay	4.9	1.9	0.0	0.0	0.0	0.0	0.5
Total Delay	64.0	44.0	35.9	25.1	6.1	50.1	3.1
LOS	E	D	D	C	A	D	A
Approach Delay		48.3		17.8			12.4
Approach LOS		D		B			B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 22.3 — Intersection LOS: C
Intersection Capacity Utilization 90.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	2	559	0	0	0	0	1229	770	319	1297	0
Future Volume (veh/h)	400	2	559	0	0	0	0	1229	770	319	1297	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	576	0	315				0	1254	786	326	1323	0
Adj No. of Lanes	2	0	1				0	2	1	2	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	749	0	354				0	1660	731	384	2230	0
Arrive On Green	0.23	0.00	0.23				0.00	0.49	0.49	0.08	0.44	0.00
Sat Flow, veh/h	3238	0	1530				0	3510	1505	3141	3510	0
Grp Volume(v), veh/h	576	0	315				0	1254	786	326	1323	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1505	1570	1710	0
Q Serve(g_s), s	15.0	0.0	17.9				0.0	26.8	43.7	9.2	26.5	0.0
Cycle Q Clear(g_c), s	15.0	0.0	17.9				0.0	26.8	43.7	9.2	26.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	749	0	354				0	1660	731	384	2230	0
V/C Ratio(X)	0.77	0.00	0.89				0.00	0.76	1.08	0.85	0.59	0.00
Avail Cap(c_a), veh/h	863	0	408				0	1660	731	384	2230	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.54	0.54	0.38	0.38	0.00
Uniform Delay (d), s/veh	32.4	0.0	33.5				0.0	18.8	23.2	40.5	16.3	0.0
Incr Delay (d2), s/veh	3.0	0.0	17.7				0.0	1.8	47.7	6.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.0	9.3				0.0	13.0	27.7	4.4	12.6	0.0
LnGrp Delay(d),s/veh	35.4	0.0	51.2				0.0	20.6	70.9	47.1	16.7	0.0
LnGrp LOS	D		D					C	F	D	B	
Approach Vol, veh/h		891						2040			1649	
Approach Delay, s/veh		41.0						40.0			22.7	
Approach LOS		D						D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.0	49.2		25.8		64.2		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	11.0	40.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	11.2	45.7		19.9		28.5		
Green Ext Time (p_c), s	0.0	0.0		0.9		25.8		

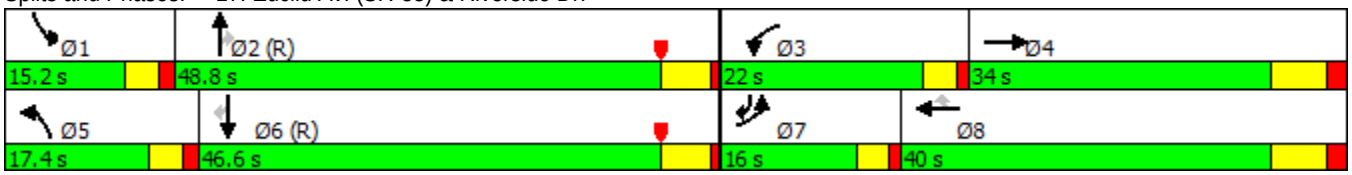
Intersection Summary	
HCM 2010 Ctrl Delay	33.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	155	399	181	358	57	110	1533	284	135	1210	172
Future Volume (vph)	155	399	181	358	57	110	1533	284	135	1210	172
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	16.0	34.0	22.0	40.0	40.0	17.4	48.8	48.8	15.2	46.6	16.0
Total Split (%)	13.3%	28.3%	18.3%	33.3%	33.3%	14.5%	40.7%	40.7%	12.7%	38.8%	13.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.5	24.2	16.7	28.4	28.4	12.2	44.9	44.9	13.2	45.9	59.8
Actuated g/C Ratio	0.10	0.20	0.14	0.24	0.24	0.10	0.37	0.37	0.11	0.38	0.50
v/c Ratio	1.00	0.77	0.87	0.48	0.14	0.72	0.90	0.41	0.81	0.69	0.22
Control Delay	123.7	51.4	84.4	40.6	2.4	55.1	50.7	16.9	69.9	29.1	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.7	51.4	84.4	40.6	2.4	55.1	50.7	16.9	69.9	29.1	11.0
LOS	F	D	F	D	A	E	D	B	E	C	B
Approach Delay		68.7		50.3			46.0			30.7	
Approach LOS		E		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 44.7	Intersection LOS: D
Intersection Capacity Utilization 83.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	399	92	181	358	57	110	1533	284	135	1210	172
Future Volume (veh/h)	155	399	92	181	358	57	110	1533	284	135	1210	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	167	429	65	195	385	61	118	1648	174	145	1301	87
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	566	85	219	770	339	142	2018	628	144	2025	774
Arrive On Green	0.10	0.19	0.19	0.14	0.23	0.23	0.03	0.14	0.14	0.03	0.14	0.14
Sat Flow, veh/h	1619	2982	449	1619	3420	1507	1619	4914	1530	1619	4914	1508
Grp Volume(v), veh/h	167	245	249	195	385	61	118	1648	174	145	1301	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1721	1619	1710	1507	1619	1638	1530	1619	1638	1508
Q Serve(g_s), s	12.0	16.3	16.5	14.2	11.8	3.9	8.7	39.1	12.3	10.7	30.1	5.1
Cycle Q Clear(g_c), s	12.0	16.3	16.5	14.2	11.8	3.9	8.7	39.1	12.3	10.7	30.1	5.1
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	325	327	219	770	339	142	2018	628	144	2025	774
V/C Ratio(X)	1.03	0.75	0.76	0.89	0.50	0.18	0.83	0.82	0.28	1.00	0.64	0.11
Avail Cap(c_a), veh/h	162	385	387	243	941	414	174	2018	628	144	2025	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.44	0.44	0.44	0.75	0.75	0.75
Uniform Delay (d), s/veh	54.0	46.0	46.0	51.0	40.6	37.5	57.4	47.5	35.9	58.2	43.5	22.8
Incr Delay (d2), s/veh	79.3	7.9	8.3	27.4	0.7	0.4	11.6	1.7	0.5	66.0	1.2	0.2
Initial Q Delay(d3),s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	8.4	8.6	8.0	5.6	1.7	4.4	18.1	5.3	7.4	13.9	2.2
LnGrp Delay(d),s/veh	133.6	53.9	54.4	78.4	41.3	37.9	69.0	49.2	36.3	124.2	44.7	23.0
LnGrp LOS	F	D	D	E	D	D	E	D	D	F	D	C
Approach Vol, veh/h		661			641			1940			1533	
Approach Delay, s/veh		74.2			52.3			49.2			51.0	
Approach LOS		E			D			D			D	

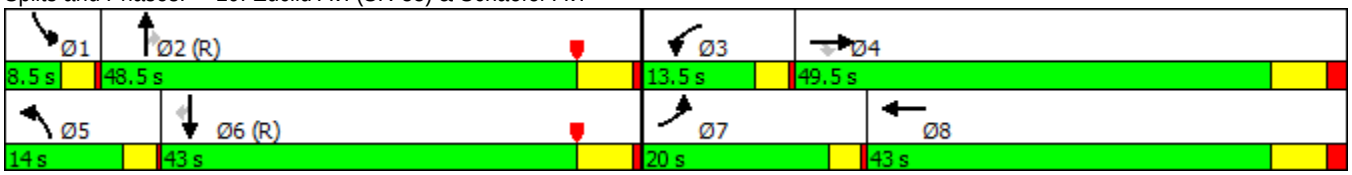
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	54.8	20.2	29.8	15.0	54.9	16.0	34.0
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	10.7	43.3	18.0	27.0	12.9	41.1	12.0	33.0
Max Q Clear Time (g_c+I1), s	12.7	41.1	16.2	18.5	10.7	32.1	14.0	13.8
Green Ext Time (p_c), s	0.0	2.1	0.0	4.3	0.0	8.4	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	53.6
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	312	234	192	28	51	121	1844	41	23	1342	137
Future Volume (vph)	312	234	192	28	51	121	1844	41	23	1342	137
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	20.0	49.5	49.5	13.5	43.0	14.0	48.5	48.5	8.5	43.0	43.0
Total Split (%)	16.7%	41.3%	41.3%	11.3%	35.8%	11.7%	40.4%	40.4%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	16.6	25.7	25.7	10.0	16.1	13.4	67.4	67.4	5.7	56.3	56.3
Actuated g/C Ratio	0.14	0.21	0.21	0.08	0.13	0.11	0.56	0.56	0.05	0.47	0.47
v/c Ratio	1.44	0.62	0.41	0.22	0.28	0.70	0.69	0.05	0.32	0.60	0.18
Control Delay	259.2	48.7	6.9	55.6	37.1	50.9	33.2	3.0	62.4	27.4	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	259.2	48.7	6.9	55.6	37.1	50.9	33.2	3.0	62.4	27.4	8.1
LOS	F	D	A	E	D	D	C	A	E	C	A
Approach Delay		126.9			42.6		33.7			26.2	
Approach LOS		F			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.44	
Intersection Signal Delay: 47.1	Intersection LOS: D
Intersection Capacity Utilization 81.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	312	234	192	28	51	15	121	1844	41	23	1342	137
Future Volume (veh/h)	312	234	192	28	51	15	121	1844	41	23	1342	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	322	241	122	29	53	10	125	1901	33	24	1384	88
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	287	244	84	108	20	142	2946	917	37	2629	800
Arrive On Green	0.14	0.16	0.16	0.05	0.07	0.07	0.06	0.40	0.40	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1473	278	1619	4914	1530	1619	4914	1496
Grp Volume(v), veh/h	322	241	122	29	0	63	125	1901	33	24	1384	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1751	1619	1638	1530	1619	1638	1496
Q Serve(g_s), s	16.5	15.6	8.7	2.1	0.0	4.2	9.2	37.5	1.6	1.8	30.7	5.9
Cycle Q Clear(g_c), s	16.5	15.6	8.7	2.1	0.0	4.2	9.2	37.5	1.6	1.8	30.7	5.9
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	287	244	84	0	128	142	2946	917	37	2629	800
V/C Ratio(X)	1.45	0.84	0.50	0.35	0.00	0.49	0.88	0.65	0.04	0.65	0.53	0.11
Avail Cap(c_a), veh/h	223	638	542	135	0	525	142	2946	917	67	2629	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.51	0.51	0.51	0.68	0.68	0.68
Uniform Delay (d), s/veh	51.8	49.0	46.1	54.9	0.0	53.4	55.9	25.6	14.8	59.1	35.6	25.4
Incr Delay (d2), s/veh	224.3	5.0	1.2	0.9	0.0	2.1	25.8	0.6	0.0	4.7	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.2	8.2	3.8	0.9	0.0	2.1	5.1	17.2	0.7	0.8	14.1	2.5
LnGrp Delay(d),s/veh	276.1	53.9	47.3	55.9	0.0	55.6	81.7	26.2	14.9	63.8	36.1	25.6
LnGrp LOS	F	D	D	E		E	F	C	B	E	D	C
Approach Vol, veh/h		685			92			2059			1496	
Approach Delay, s/veh		157.2			55.7			29.4			35.9	
Approach LOS		F			E			C			D	

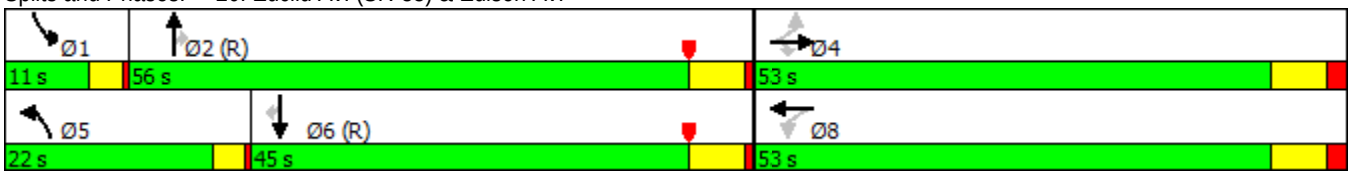
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	77.9	9.7	26.1	14.0	70.2	20.0	15.8
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	42.5	10.0	42.5	10.5	37.0	16.5	36.0
Max Q Clear Time (g_c+I1), s	3.8	39.5	4.1	17.6	11.2	32.7	18.5	6.2
Green Ext Time (p_c), s	0.0	2.9	0.0	1.5	0.0	4.2	0.0	1.5

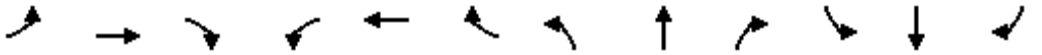
Intersection Summary	
HCM 2010 Ctrl Delay	52.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	357	490	287	29	145	169	1583	79	71	1309	176
Future Volume (vph)	357	490	287	29	145	169	1583	79	71	1309	176
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	22.0	56.0	56.0	11.0	45.0	45.0
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%	18.3%	46.7%	46.7%	9.2%	37.5%	37.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.9	43.9	43.9	43.9	43.9	15.9	52.2	52.2	7.4	43.7	43.7
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.13	0.44	0.44	0.06	0.36	0.36
v/c Ratio	0.94	0.76	0.40	0.20	0.28	0.81	0.76	0.12	0.73	0.75	0.28
Control Delay	70.6	41.6	4.5	29.2	25.8	56.8	30.0	11.3	112.6	16.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.6	41.6	4.5	29.2	25.8	56.8	30.0	11.3	112.6	16.5	2.5
LOS	E	D	A	C	C	E	C	B	F	B	A
Approach Delay		41.3			26.3		31.7			19.3	
Approach LOS		D			C		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 29.7	Intersection LOS: C
Intersection Capacity Utilization 89.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	357	490	287	29	145	31	169	1583	79	71	1309	176
Future Volume (veh/h)	357	490	287	29	145	31	169	1583	79	71	1309	176
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	364	500	201	30	148	27	172	1615	61	72	1336	153
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	425	690	578	164	568	104	198	2086	649	89	1753	546
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.14	0.14	0.11	0.71	0.71
Sat Flow, veh/h	1161	1800	1508	715	1482	270	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	364	500	201	30	0	175	172	1615	61	72	1336	153
Grp Sat Flow(s),veh/h/ln	1161	1800	1508	715	0	1752	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	37.6	28.5	11.4	4.5	0.0	8.2	12.7	38.0	4.2	5.2	20.5	4.3
Cycle Q Clear(g_c), s	45.8	28.5	11.4	32.9	0.0	8.2	12.7	38.0	4.2	5.2	20.5	4.3
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	425	690	578	164	0	672	198	2086	649	89	1753	546
V/C Ratio(X)	0.86	0.72	0.35	0.18	0.00	0.26	0.87	0.77	0.09	0.81	0.76	0.28
Avail Cap(c_a), veh/h	425	690	578	164	0	672	250	2086	649	101	1753	546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.63	0.63	0.63	0.80	0.80	0.80
Uniform Delay (d), s/veh	41.0	31.6	26.3	45.7	0.0	25.3	56.6	46.1	31.5	52.8	14.0	11.7
Incr Delay (d2), s/veh	15.6	3.8	0.4	0.5	0.0	0.2	13.1	1.8	0.2	25.4	2.6	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.9	14.9	4.8	0.9	0.0	4.0	6.4	17.7	1.8	2.9	9.3	1.9
LnGrp Delay(d),s/veh	56.7	35.4	26.7	46.2	0.0	25.6	69.7	47.9	31.7	78.3	16.6	12.7
LnGrp LOS	E	D	C	D		C	E	D	C	E	B	B
Approach Vol, veh/h		1065			205			1848			1561	
Approach Delay, s/veh		41.0			28.6			49.4			19.0	
Approach LOS		D			C			D			B	

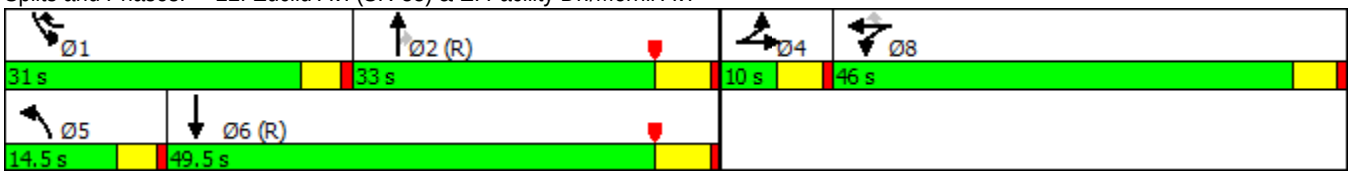
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.1	56.9		53.0	18.2	48.8		53.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	50.0		46.0	18.5	39.0		46.0
Max Q Clear Time (g_c+I1), s	7.2	40.0		47.8	14.7	22.5		34.9
Green Ext Time (p_c), s	0.0	9.1		0.0	0.1	14.5		4.8

Intersection Summary	
HCM 2010 Ctrl Delay	36.4
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	22	0	460	2	1442	356	698	1098
Future Volume (vph)	22	0	460	2	1442	356	698	1098
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	31.0	14.5	33.0	33.0	31.0	49.5
Total Split (%)	8.3%	38.3%	25.8%	12.1%	27.5%	27.5%	25.8%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	22.3	61.6	10.0	39.9	39.9	34.3	75.8
Actuated g/C Ratio	0.04	0.19	0.51	0.08	0.33	0.33	0.29	0.63
v/c Ratio	0.49	0.63	0.58	0.01	0.92	0.64	0.81	0.38
Control Delay	63.3	52.4	15.9	58.5	43.3	24.4	33.2	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	52.4	15.9	58.5	43.3	24.4	33.2	8.8
LOS	E	D	B	E	D	C	C	A
Approach Delay	63.3	26.4			39.6			18.3
Approach LOS	E	C			D			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 99 (83%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 28.8	Intersection LOS: C
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	11	185	0	460	2	1442	356	698	1098	1
Future Volume (veh/h)	5	22	11	185	0	460	2	1442	356	698	1098	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1872	1800	1768	1800	1800
Adj Flow Rate, veh/h	5	24	4	199	0	467	2	1551	354	751	1181	1
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	35	6	440	0	730	9	1656	489	721	2736	2
Arrive On Green	0.03	0.03	0.03	0.26	0.00	0.26	0.01	0.32	0.32	0.22	0.54	0.54
Sat Flow, veh/h	265	1272	212	1714	0	1530	1619	5111	1510	3267	5071	4
Grp Volume(v), veh/h	33	0	0	199	0	467	2	1551	354	751	763	419
Grp Sat Flow(s),veh/h/ln	1749	0	0	1714	0	1530	1619	1704	1510	1633	1638	1799
Q Serve(g_s), s	2.2	0.0	0.0	11.7	0.0	27.6	0.1	35.3	24.8	26.5	16.8	16.8
Cycle Q Clear(g_c), s	2.2	0.0	0.0	11.7	0.0	27.6	0.1	35.3	24.8	26.5	16.8	16.8
Prop In Lane	0.15		0.12	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	49	0	0	440	0	730	9	1656	489	721	1767	971
V/C Ratio(X)	0.68	0.00	0.00	0.45	0.00	0.64	0.23	0.94	0.72	1.04	0.43	0.43
Avail Cap(c_a), veh/h	73	0	0	586	0	861	135	1656	489	721	1767	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.69	0.69	0.69	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.8	0.0	0.0	37.5	0.0	23.6	59.4	39.4	35.8	46.8	16.6	16.6
Incr Delay (d2), s/veh	6.0	0.0	0.0	0.3	0.0	0.7	3.4	8.5	6.3	44.7	0.8	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	5.6	0.0	11.8	0.1	18.0	11.2	16.4	7.7	8.6
LnGrp Delay(d),s/veh	63.8	0.0	0.0	37.8	0.0	24.3	62.8	47.9	42.2	91.4	17.4	18.0
LnGrp LOS	E			D		C	E	D	D	F	B	B
Approach Vol, veh/h		33			666			1907			1933	
Approach Delay, s/veh		63.8			28.3			46.9			46.3	
Approach LOS		E			C			D			D	

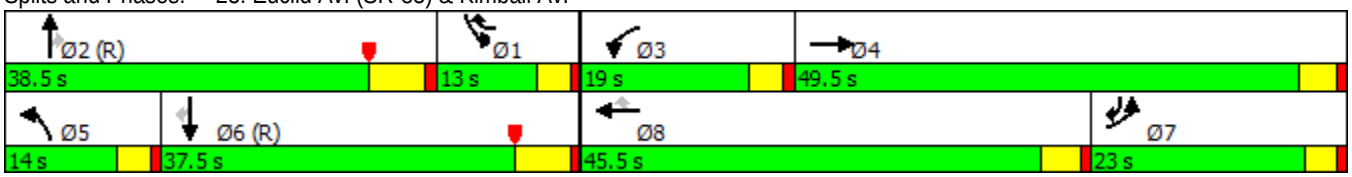
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	31.0	44.9		8.3	5.1	70.7		35.8
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	26.5	27.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	28.5	37.3		4.2	2.1	18.8		29.6
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	19.8		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	44.0
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	638	812	207	342	279	126	829	155	248	896	204
Future Volume (vph)	638	812	207	342	279	126	829	155	248	896	204
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	1	5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	9.0	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	23.0	49.5	19.0	45.5	13.0	14.0	38.5	38.5	13.0	37.5	23.0
Total Split (%)	19.2%	41.3%	15.8%	37.9%	10.8%	11.7%	32.1%	32.1%	10.8%	31.3%	19.2%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	36.9	42.5	15.3	20.9	39.0	12.5	30.1	30.1	13.6	31.2	70.1
Actuated g/C Ratio	0.31	0.35	0.13	0.17	0.32	0.10	0.25	0.25	0.11	0.26	0.58
v/c Ratio	0.69	0.78	1.05	0.60	0.51	0.78	0.70	0.32	0.73	0.73	0.22
Control Delay	42.5	39.4	128.5	48.7	22.8	76.5	23.1	2.7	53.9	33.7	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	39.4	128.5	48.7	22.8	76.5	23.1	2.7	53.9	33.7	5.9
LOS	D	D	F	D	C	E	C	A	D	C	A
Approach Delay		40.7		59.9			26.3			33.2	
Approach LOS		D		E			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 38.6	Intersection LOS: D
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	638	812	83	207	342	279	126	829	155	248	896	204
Future Volume (veh/h)	638	812	83	207	342	279	126	829	155	248	896	204
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	665	846	82	216	356	257	131	864	146	258	933	194
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	910	946	92	202	450	498	135	1033	322	608	1657	953
Arrive On Green	0.29	0.30	0.30	0.13	0.13	0.13	0.17	0.42	0.42	0.19	0.34	0.34
Sat Flow, veh/h	3141	3151	305	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	665	459	469	216	356	257	131	864	146	258	933	194
Grp Sat Flow(s),veh/h/ln	1570	1710	1746	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	22.9	30.8	30.8	15.0	12.1	0.0	9.7	18.9	6.0	8.7	18.6	2.1
Cycle Q Clear(g_c), s	22.9	30.8	30.8	15.0	12.1	0.0	9.7	18.9	6.0	8.7	18.6	2.1
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	910	513	524	202	450	498	135	1033	322	608	1657	953
V/C Ratio(X)	0.73	0.89	0.89	1.07	0.79	0.52	0.97	0.84	0.45	0.42	0.56	0.20
Avail Cap(c_a), veh/h	910	641	655	202	1169	819	135	1331	414	608	1657	953
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.37	0.37	0.37	1.00	1.00	1.00	0.72	0.72	0.72	0.91	0.91	0.91
Uniform Delay (d), s/veh	38.4	40.2	40.2	52.5	50.5	32.8	49.9	32.9	16.2	42.5	32.5	2.9
Incr Delay (d2), s/veh	1.0	5.5	5.4	82.2	1.2	0.3	57.0	6.0	3.3	0.2	1.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	15.3	15.6	11.3	5.8	6.9	6.4	9.0	2.8	3.8	8.7	1.3
LnGrp Delay(d),s/veh	39.4	45.7	45.6	134.7	51.7	33.1	106.8	38.9	19.5	42.7	33.8	3.3
LnGrp LOS	D	D	D	F	D	C	F	D	B	D	C	A
Approach Vol, veh/h		1593			829			1141			1385	
Approach Delay, s/veh		43.0			67.6			44.2			31.2	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.2	31.2	19.0	40.5	14.0	46.5	39.3	20.3
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.5	* 4.5
Max Green Setting (Gmax), s	9.0	* 33	15.0	45.0	10.0	31.5	19.0	* 41
Max Q Clear Time (g_c+I1), s	10.7	20.9	17.0	32.8	11.7	20.6	24.9	14.1
Green Ext Time (p_c), s	0.0	4.4	0.0	3.2	0.0	5.0	0.0	1.7

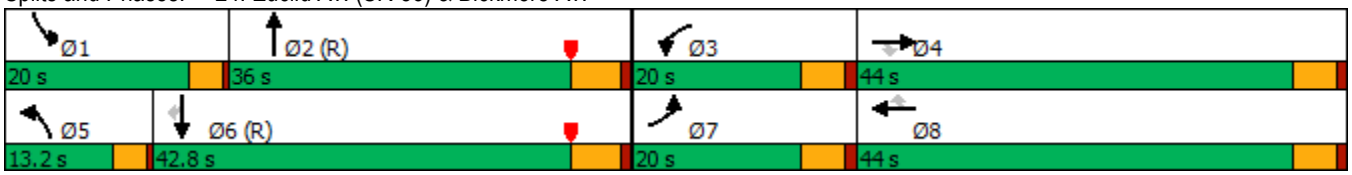
Intersection Summary	
HCM 2010 Ctrl Delay	44.1
HCM 2010 LOS	D

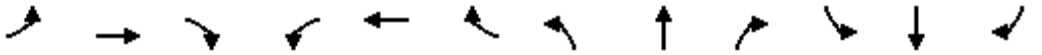
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	117	122	120	91	43	117	48	880	219	849	79
Future Volume (vph)	117	122	120	91	43	117	48	880	219	849	79
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	28.0	28.0	10.0	28.0	28.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	20.0	44.0	44.0	20.0	44.0	44.0	13.2	36.0	20.0	42.8	42.8
Total Split (%)	16.7%	36.7%	36.7%	16.7%	36.7%	36.7%	11.0%	30.0%	16.7%	35.7%	35.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.8	14.3	14.3	11.4	12.9	12.9	8.4	47.5	27.8	68.6	68.6
Actuated g/C Ratio	0.11	0.12	0.12	0.10	0.11	0.11	0.07	0.40	0.23	0.57	0.57
v/c Ratio	0.76	0.64	0.44	0.66	0.25	0.46	0.47	0.63	0.65	0.34	0.10
Control Delay	78.2	62.6	12.1	72.0	49.3	12.6	94.5	16.7	28.9	16.6	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.2	62.6	12.1	72.0	49.3	12.6	94.5	16.7	28.9	16.6	9.9
LOS	E	E	B	E	D	B	F	B	C	B	A
Approach Delay		50.8			40.4			19.9		18.5	
Approach LOS		D			D			B		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 25.0	Intersection LOS: C
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	122	120	91	43	117	48	880	207	219	849	79
Future Volume (veh/h)	117	122	120	91	43	117	48	880	207	219	849	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	130	136	114	101	48	118	53	978	220	243	943	88
Adj No. of Lanes	1	1	1	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	155	203	172	127	171	145	66	2052	460	223	2996	914
Arrive On Green	0.10	0.11	0.11	0.08	0.09	0.09	0.01	0.17	0.17	0.28	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	1800	1530	1619	3998	897	1619	4914	1498
Grp Volume(v), veh/h	130	136	114	101	48	118	53	801	397	243	943	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1619	1638	1619	1619	1638	1498
Q Serve(g_s), s	9.5	8.7	8.6	7.4	3.0	9.1	3.9	26.5	26.6	16.5	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.7	8.6	7.4	3.0	9.1	3.9	26.5	26.6	16.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.55	1.00		1.00
Lane Grp Cap(c), veh/h	155	203	172	127	171	145	66	1681	831	223	2996	914
V/C Ratio(X)	0.84	0.67	0.66	0.80	0.28	0.81	0.80	0.48	0.48	1.09	0.31	0.10
Avail Cap(c_a), veh/h	202	585	497	202	585	497	131	1681	831	223	2996	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.20	0.20	0.20	0.51	0.51	0.51
Uniform Delay (d), s/veh	53.3	51.1	51.1	54.4	50.5	53.3	58.7	35.3	35.3	43.5	0.0	0.0
Incr Delay (d2), s/veh	16.6	1.4	1.6	4.2	0.3	4.1	1.7	0.2	0.4	70.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	4.4	3.7	3.4	1.5	4.0	1.8	12.1	12.1	11.6	0.0	0.0
LnGrp Delay(d),s/veh	69.9	52.6	52.7	58.6	50.8	57.4	60.4	35.5	35.7	113.8	0.1	0.1
LnGrp LOS	E	D	D	E	D	E	E	D	D	F	A	A
Approach Vol, veh/h		380			267			1251			1274	
Approach Delay, s/veh		58.5			56.7			36.6			21.8	
Approach LOS		E			E			D			C	

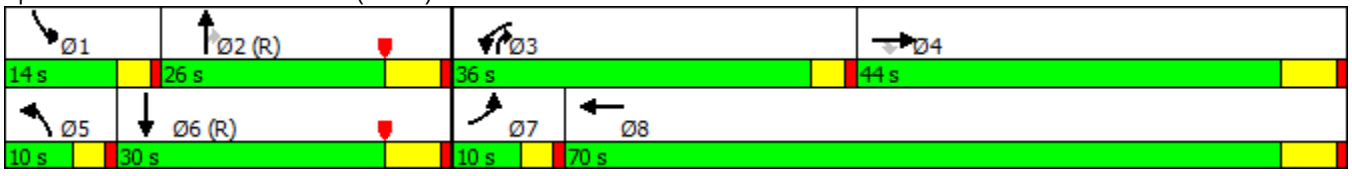
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	67.1	14.4	18.5	8.4	78.7	16.5	16.4
Change Period (Y+Rc), s	3.5	5.5	5.0	5.0	3.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	16.5	30.5	15.0	39.0	9.7	37.3	15.0	39.0
Max Q Clear Time (g_c+I1), s	18.5	28.6	9.4	10.7	5.9	2.0	11.5	11.1
Green Ext Time (p_c), s	0.0	1.0	0.0	0.6	0.0	4.1	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	353	30	494	80	35	1006	1117	106	901
Future Volume (vph)	15	353	30	494	80	35	1006	1117	106	901
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	10.0	44.0	44.0	36.0	70.0	10.0	26.0	36.0	14.0	30.0
Total Split (%)	8.3%	36.7%	36.7%	30.0%	58.3%	8.3%	21.7%	30.0%	11.7%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.5	30.3	30.3	32.0	62.3	6.4	26.3	64.3	11.4	35.0
Actuated g/C Ratio	0.05	0.25	0.25	0.27	0.52	0.05	0.22	0.54	0.10	0.29
v/c Ratio	0.20	0.80	0.06	0.65	0.16	0.42	0.96	1.24	0.71	0.66
Control Delay	61.5	55.2	0.3	43.5	10.0	67.9	46.1	128.3	71.3	49.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	55.2	0.3	43.5	10.0	67.9	46.1	128.3	71.3	49.2
LOS	E	E	A	D	B	E	D	F	E	D
Approach Delay		51.2			36.1		89.0			51.5
Approach LOS		D			D		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 68.4	Intersection LOS: E
Intersection Capacity Utilization 110.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	353	30	494	80	60	35	1006	1117	106	901	15
Future Volume (veh/h)	15	353	30	494	80	60	35	1006	1117	106	901	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	364	0	509	82	56	36	1037	719	109	929	11
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	425	361	565	410	280	47	1597	789	132	1888	22
Arrive On Green	0.02	0.24	0.00	0.19	0.41	0.41	0.03	0.32	0.32	0.03	0.12	0.12
Sat Flow, veh/h	1619	1800	1530	2956	998	682	1619	4914	1530	1619	5005	59
Grp Volume(v), veh/h	15	364	0	509	0	138	36	1037	719	109	608	332
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1680	1619	1638	1530	1619	1638	1788
Q Serve(g_s), s	1.1	23.2	0.0	20.2	0.0	6.3	2.6	21.7	39.0	8.0	20.8	20.8
Cycle Q Clear(g_c), s	1.1	23.2	0.0	20.2	0.0	6.3	2.6	21.7	39.0	8.0	20.8	20.8
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	27	425	361	565	0	690	47	1597	789	132	1236	674
V/C Ratio(X)	0.57	0.86	0.00	0.90	0.00	0.20	0.76	0.65	0.91	0.83	0.49	0.49
Avail Cap(c_a), veh/h	81	570	484	788	0	896	81	1597	789	135	1236	674
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.93	0.93	0.93
Uniform Delay (d), s/veh	58.6	43.9	0.0	47.4	0.0	22.7	57.8	34.7	26.5	57.5	41.8	41.8
Incr Delay (d2), s/veh	6.8	10.9	0.0	8.5	0.0	0.2	0.9	0.2	2.0	28.7	1.3	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.8	0.0	8.9	0.0	3.0	1.2	9.8	22.0	4.7	9.7	10.8
LnGrp Delay(d),s/veh	65.4	54.8	0.0	55.9	0.0	22.9	58.7	34.8	28.5	86.3	43.1	44.2
LnGrp LOS	E	D		E		C	E	C	C	F	D	D
Approach Vol, veh/h		379			647			1792			1049	
Approach Delay, s/veh		55.2			48.9			32.8			47.9	
Approach LOS		E			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	45.0	26.9	34.3	7.5	51.3	6.0	55.3
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	20.0	32.0	38.0	6.0	24.0	6.0	64.0
Max Q Clear Time (g_c+I1), s	10.0	41.0	22.2	25.2	4.6	22.8	3.1	8.3
Green Ext Time (p_c), s	0.0	0.0	0.7	3.1	0.0	1.0	0.0	4.6

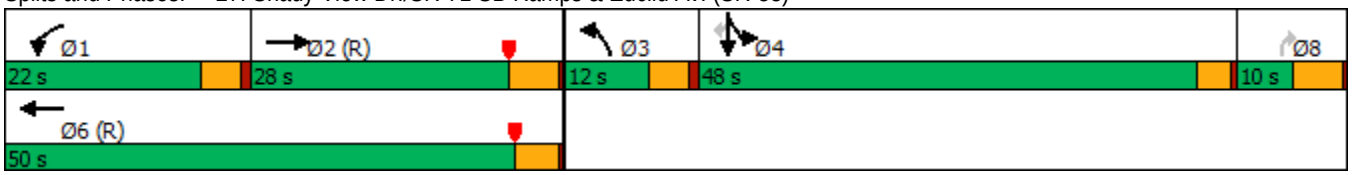
Intersection Summary	
HCM 2010 Ctrl Delay	41.8
HCM 2010 LOS	D

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	328	105	243	31	16	770	149	162
Future Volume (vph)	328	105	243	31	16	770	149	162
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.0	22.0	50.0	12.0	10.0	48.0	48.0	48.0
Total Split (%)	23.3%	18.3%	41.7%	10.0%	8.3%	40.0%	40.0%	40.0%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	38.7	13.1	56.8	6.9	5.0	38.0	38.0	38.0
Actuated g/C Ratio	0.32	0.11	0.47	0.06	0.04	0.32	0.32	0.32
v/c Ratio	0.35	0.62	0.16	0.35	0.08	0.80	0.27	0.28
Control Delay	34.9	75.1	12.9	64.5	0.9	43.8	30.7	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	75.1	12.9	64.5	0.9	43.8	30.7	5.1
LOS	C	E	B	E	A	D	C	A
Approach Delay	34.9		31.6				36.2	
Approach LOS	C		C				D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 35.2 — Intersection LOS: D
Intersection Capacity Utilization 53.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	328	45	105	243	0	31	0	16	770	149	162
Future Volume (veh/h)	0	328	45	105	243	0	31	0	16	770	149	162
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	338	46	108	251	0	32	0	16	794	154	167
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1583	214	130	2189	0	0	0	0	908	520	442
Arrive On Green	0.00	0.52	0.52	0.16	1.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29
Sat Flow, veh/h	0	3119	409	1619	3510	0		0		3141	1800	1530
Grp Volume(v), veh/h	0	190	194	108	251	0		0.0		794	154	167
Grp Sat Flow(s),veh/h/ln	0	1710	1728	1619	1710	0				1570	1800	1530
Q Serve(g_s), s	0.0	7.1	7.3	7.8	0.0	0.0				28.9	8.0	10.5
Cycle Q Clear(g_c), s	0.0	7.1	7.3	7.8	0.0	0.0				28.9	8.0	10.5
Prop In Lane	0.00		0.24	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	893	903	130	2189	0				908	520	442
V/C Ratio(X)	0.00	0.21	0.22	0.83	0.11	0.00				0.87	0.30	0.38
Avail Cap(c_a), veh/h	0	893	903	236	2189	0				1165	668	567
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	15.4	15.4	49.6	0.0	0.0				40.6	33.2	34.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	12.8	0.1	0.0				6.2	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.5	3.6	3.9	0.0	0.0				13.2	4.0	4.5
LnGrp Delay(d),s/veh	0.0	15.9	16.0	62.4	0.1	0.0				46.8	33.5	34.6
LnGrp LOS		B	B	E	A					D	C	C
Approach Vol, veh/h		384			359						1115	
Approach Delay, s/veh		15.9			18.8						43.1	
Approach LOS		B			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.1	67.7		38.2		81.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	17.5	23.0		44.5		* 46		
Max Q Clear Time (g_c+I1), s	9.8	9.3		30.9		2.0		
Green Ext Time (p_c), s	0.1	1.0		3.8		1.2		

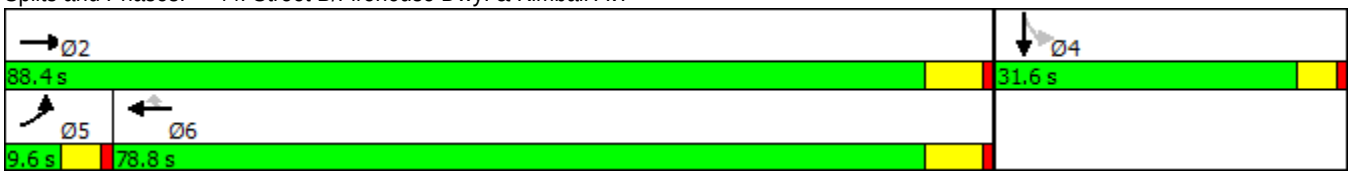
Intersection Summary	
HCM 2010 Ctrl Delay	32.8
HCM 2010 LOS	C

Notes

Lane Group	EBT	WBT	Ø4	Ø5
Lane Configurations				
Traffic Volume (vph)	1187	876		
Future Volume (vph)	1187	876		
Turn Type	NA	NA		
Protected Phases	2	6	4	5
Permitted Phases				
Detector Phase	2	6		
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	23.2	23.2	31.6	9.6
Total Split (s)	88.4	78.8	31.6	9.6
Total Split (%)	73.7%	65.7%	26%	8%
Yellow Time (s)	5.2	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	6.2	6.2		
Lead/Lag		Lag		Lead
Lead-Lag Optimize?		Yes		Yes
Recall Mode	None	None	Min	None
Act Effct Green (s)	26.5	26.5		
Actuated g/C Ratio	0.52	0.52		
v/c Ratio	0.70	0.52		
Control Delay	12.0	9.5		
Queue Delay	0.0	0.0		
Total Delay	12.0	9.5		
LOS	B	A		
Approach Delay	12.0	9.5		
Approach LOS	B	A		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 50.9		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.70		
Intersection Signal Delay: 11.0	Intersection LOS: B	
Intersection Capacity Utilization 39.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1187	0	0	876	0	0	0	0	0	0	0
Future Volume (veh/h)	0	1187	0	0	876	0	0	0	0	0	0	0
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800				1700	1800	1800
Adj Flow Rate, veh/h	0	1249	0	0	922	0				0	0	0
Adj No. of Lanes	1	2	0	0	2	1				0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	4	2874	0	0	2874	1286				0	5	0
Arrive On Green	0.00	0.84	0.00	0.00	0.84	0.00				0.00	0.00	0.00
Sat Flow, veh/h	1619	3510	0	0	3510	1530				0	1800	0
Grp Volume(v), veh/h	0	1249	0	0	922	0				0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530				0	1800	0
Q Serve(g_s), s	0.0	3.6	0.0	0.0	2.3	0.0				0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.6	0.0	0.0	2.3	0.0				0.0	0.0	0.0
Prop In Lane	1.00		0.00	0.00		1.00				0.00		0.00
Lane Grp Cap(c), veh/h	4	2874	0	0	2874	1286				0	5	0
V/C Ratio(X)	0.00	0.43	0.00	0.00	0.32	0.00				0.00	0.00	0.00
Avail Cap(c_a), veh/h	208	7234	0	0	6390	2858				0	1251	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.8	0.0	0.0	0.7	0.0				0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0				0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	0.0	0.0	1.0	0.0				0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.9	0.0	0.0	0.7	0.0				0.0	0.0	0.0
LnGrp LOS		A			A							
Approach Vol, veh/h		1249			922						0	
Approach Delay, s/veh		0.9			0.7						0.0	
Approach LOS		A			A							

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		38.9		0.0	0.0	38.9		
Change Period (Y+Rc), s		6.2		4.6	4.6	6.2		
Max Green Setting (Gmax), s		82.2		27.0	5.0	72.6		
Max Q Clear Time (g_c+I1), s		5.6		0.0	0.0	4.3		
Green Ext Time (p_c), s		27.1		0.0	0.0	26.3		

Intersection Summary	
HCM 2010 Ctrl Delay	0.8
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	268	683	14	416	26	6	76	18
Future Volume (vph)	268	683	14	416	26	6	76	18
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	37.4	9.6	24.0	33.0	33.0	33.0	33.0
Total Split (%)	28.8%	46.8%	12.0%	30.0%	41.3%	41.3%	41.3%	41.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	16.0	34.8	5.1	15.9		26.1		26.1
Actuated g/C Ratio	0.22	0.47	0.07	0.22		0.35		0.35
v/c Ratio	0.81	0.49	0.14	0.75		0.10		0.90
Control Delay	48.4	15.5	38.4	35.2		18.0		46.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	48.4	15.5	38.4	35.2		18.0		46.0
LOS	D	B	D	D		B		D
Approach Delay		24.3		35.3		18.0		46.0
Approach LOS		C		D		B		D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 73.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 31.8	Intersection LOS: C
Intersection Capacity Utilization 72.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	683	47	14	416	89	26	6	10	76	18	348
Future Volume (veh/h)	268	683	47	14	416	89	26	6	10	76	18	348
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	285	727	50	15	443	95	28	6	11	81	19	370
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	326	1324	91	29	632	135	242	57	69	130	44	414
Arrive On Green	0.20	0.41	0.41	0.02	0.23	0.23	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1619	3240	223	1619	2807	598	449	162	198	196	125	1187
Grp Volume(v), veh/h	285	383	394	15	269	269	45	0	0	470	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1753	1619	1710	1695	809	0	0	1508	0	0
Q Serve(g_s), s	11.7	11.7	11.7	0.6	9.9	10.0	0.0	0.0	0.0	14.4	0.0	0.0
Cycle Q Clear(g_c), s	11.7	11.7	11.7	0.6	9.9	10.0	1.2	0.0	0.0	20.2	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.35	0.62		0.24	0.17		0.79
Lane Grp Cap(c), veh/h	326	699	716	29	385	382	367	0	0	587	0	0
V/C Ratio(X)	0.87	0.55	0.55	0.51	0.70	0.71	0.12	0.00	0.00	0.80	0.00	0.00
Avail Cap(c_a), veh/h	435	779	798	118	444	440	445	0	0	686	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.5	15.4	15.4	33.3	24.4	24.4	14.9	0.0	0.0	21.0	0.0	0.0
Incr Delay (d2), s/veh	11.6	0.7	0.7	5.0	4.0	4.3	0.1	0.0	0.0	5.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	5.7	5.8	0.3	5.1	5.1	0.6	0.0	0.0	9.3	0.0	0.0
LnGrp Delay(d),s/veh	38.1	16.1	16.1	38.4	28.4	28.7	15.1	0.0	0.0	26.9	0.0	0.0
LnGrp LOS	D	B	B	D	C	C	B			C		
Approach Vol, veh/h		1062			553			45			470	
Approach Delay, s/veh		22.0			28.8			15.1			26.9	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	34.2		28.5	18.4	21.6		28.5
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	31.2		28.4	18.4	17.8		28.4
Max Q Clear Time (g_c+I1), s	2.6	13.7		22.2	13.7	12.0		3.2
Green Ext Time (p_c), s	0.0	6.8		1.7	0.2	3.3		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	351	373	193	159	334	204
Future Volume (vph)	351	373	193	159	334	204
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	14.0	46.8	32.8	32.8
Total Split (%)	41.5%	41.5%	17.5%	58.5%	41.0%	41.0%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	19.0	17.3	9.8	32.5	18.0	18.0
Actuated g/C Ratio	0.30	0.28	0.16	0.52	0.29	0.29
v/c Ratio	0.77	0.57	0.82	0.18	0.69	0.37
Control Delay	31.6	5.8	58.9	9.5	28.1	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	5.8	58.9	9.5	28.1	5.1
LOS	C	A	E	A	C	A
Approach Delay				36.6	19.4	
Approach LOS				D	B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 62.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 22.7	Intersection LOS: C
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	351	0	373	0	0	0	193	159	0	0	334	204
Future Volume (veh/h)	351	0	373	0	0	0	193	159	0	0	334	204
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	377	0	401				208	171	0	0	359	219
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	490	0	463				250	919	0	0	493	409
Arrive On Green	0.30	0.00	0.30				0.15	0.51	0.00	0.00	0.27	0.27
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1493
Grp Volume(v), veh/h	377	0	401				208	171	0	0	359	219
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1493
Q Serve(g_s), s	11.8	0.0	13.8				7.0	2.9	0.0	0.0	10.1	7.0
Cycle Q Clear(g_c), s	11.8	0.0	13.8				7.0	2.9	0.0	0.0	10.1	7.0
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	490	0	463				250	919	0	0	493	409
V/C Ratio(X)	0.77	0.00	0.87				0.83	0.19	0.00	0.00	0.73	0.54
Avail Cap(c_a), veh/h	830	0	784				273	1322	0	0	871	722
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	0.0	18.4				22.9	7.4	0.0	0.0	18.4	17.2
Incr Delay (d2), s/veh	1.0	0.0	2.4				16.5	0.1	0.0	0.0	2.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	10.8				4.3	1.4	0.0	0.0	5.3	5.9
LnGrp Delay(d),s/veh	18.6	0.0	20.8				39.4	7.5	0.0	0.0	20.4	18.3
LnGrp LOS	B		C				D	A			C	B
Approach Vol, veh/h		778						379			578	
Approach Delay, s/veh		19.8						25.0			19.6	
Approach LOS		B						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		34.3		21.5	13.2	21.1		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		41.0		28.6	9.4	27.0		
Max Q Clear Time (g_c+I1), s		4.9		15.8	9.0	12.1		
Green Ext Time (p_c), s		3.9		1.1	0.0	3.2		

Intersection Summary	
HCM 2010 Ctrl Delay	20.9
HCM 2010 LOS	C

APPENDIX 8.12:

OPENING YEAR CUMULATIVE (2020) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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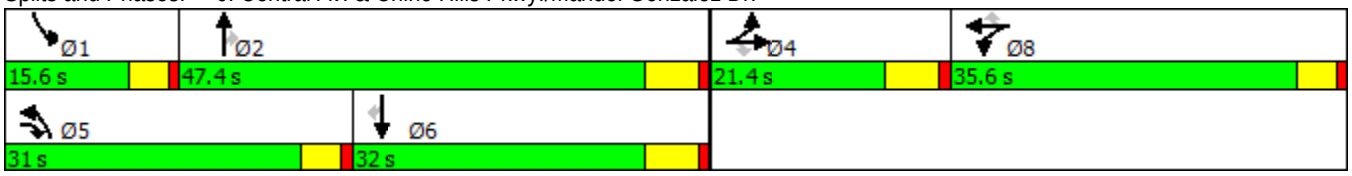
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	54	341	2	3	8	396	864	47	67	724	265
Future Volume (vph)	319	54	341	2	3	8	396	864	47	67	724	265
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	5	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	31.0	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	25.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	47.1	13.5	13.5	13.5	26.9	47.6	47.6	8.2	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.50	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.78	0.74	0.39	0.01	0.01	0.03	0.93	0.54	0.06	0.52	0.81	0.51
Control Delay	61.7	56.9	2.5	35.5	35.3	0.1	64.5	21.6	0.1	57.9	41.4	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	56.9	2.5	35.5	35.3	0.1	64.5	21.6	0.1	57.9	41.4	15.7
LOS	E	E	A	D	D	A	E	C	A	E	D	B
Approach Delay		32.2			12.7			33.8			36.0	
Approach LOS		C			B			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 34.1	Intersection LOS: C
Intersection Capacity Utilization 76.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	319	54	341	2	3	8	396	864	47	67	724	265
Future Volume (veh/h)	319	54	341	2	3	8	396	864	47	67	724	265
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	389	0	275	2	3	4	430	939	39	73	787	233
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	501	0	671	36	40	34	459	1806	791	91	1028	454
Arrive On Green	0.15	0.00	0.15	0.02	0.02	0.02	0.28	0.53	0.53	0.06	0.30	0.30
Sat Flow, veh/h	3238	0	1530	1619	1800	1530	1619	3420	1498	1619	3420	1511
Grp Volume(v), veh/h	389	0	275	2	3	4	430	939	39	73	787	233
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1530	1619	1710	1498	1619	1710	1511
Q Serve(g_s), s	10.1	0.0	10.7	0.1	0.1	0.2	22.6	15.6	1.1	3.9	18.2	11.1
Cycle Q Clear(g_c), s	10.1	0.0	10.7	0.1	0.1	0.2	22.6	15.6	1.1	3.9	18.2	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	501	0	671	36	40	34	459	1806	791	91	1028	454
V/C Ratio(X)	0.78	0.00	0.41	0.05	0.07	0.12	0.94	0.52	0.05	0.80	0.77	0.51
Avail Cap(c_a), veh/h	579	0	708	576	640	544	490	1806	791	204	1028	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	0.0	16.8	41.7	41.7	41.8	30.5	13.4	10.0	40.7	27.7	25.2
Incr Delay (d2), s/veh	5.7	0.0	0.4	0.6	0.8	1.5	24.1	1.1	0.1	6.0	5.4	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	4.6	0.1	0.1	0.1	13.1	7.6	0.5	1.9	9.3	5.1
LnGrp Delay(d),s/veh	41.1	0.0	17.2	42.3	42.5	43.3	54.6	14.5	10.1	46.7	33.2	29.3
LnGrp LOS	D		B	D	D	D	D	B	B	D	C	C
Approach Vol, veh/h		664			9			1408			1093	
Approach Delay, s/veh		31.2			42.8			26.6			33.2	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.5	51.8		19.3	29.3	32.0		6.6
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	5.9	17.6		12.7	24.6	20.2		2.2
Green Ext Time (p_c), s	0.0	17.5		0.8	0.2	5.3		0.0

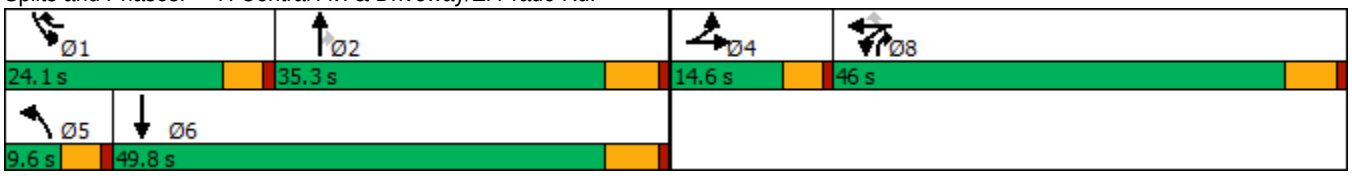
Intersection Summary	
HCM 2010 Ctrl Delay	29.9
HCM 2010 LOS	C

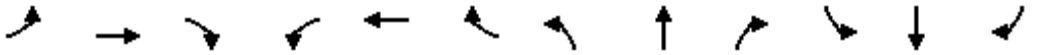
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	1085	3	537	2	798	802	498	652
Future Volume (vph)	1	1	1085	3	537	2	798	802	498	652
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	46.0	46.0	24.1	9.6	35.3	46.0	24.1	49.8
Total Split (%)	12.2%	12.2%	38.3%	38.3%	20.1%	8.0%	29.4%	38.3%	20.1%	41.5%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.0	10.0	40.3	40.3	65.7	5.0	29.6	69.9	19.5	52.0
Actuated g/C Ratio	0.09	0.09	0.37	0.37	0.61	0.05	0.27	0.65	0.18	0.48
v/c Ratio	0.01	0.01	0.92	0.88	0.48	0.02	0.87	0.66	0.90	0.27
Control Delay	48.0	41.0	54.5	47.7	7.8	53.0	48.8	6.4	62.9	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	41.0	54.5	47.7	7.8	53.0	48.8	6.4	62.9	18.4
LOS	D	D	D	D	A	D	D	A	E	B
Approach Delay		43.3		36.8			27.6			37.5
Approach LOS		D		D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 33.6	Intersection LOS: C
Intersection Capacity Utilization 92.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	1085	3	537	2	798	802	498	652	10
Future Volume (veh/h)	1	1	1	1085	3	537	2	798	802	498	652	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1768	1872	1872	1768	1872	1872	1768	1872	1872	1768	1872	1872
Adj Flow Rate, veh/h	1	1	1	1208	0	454	2	887	722	553	724	9
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	13	7	7	1221	0	857	5	996	995	574	2431	30
Arrive On Green	0.01	0.01	0.01	0.36	0.00	0.36	0.00	0.27	0.27	0.18	0.44	0.44
Sat Flow, veh/h	1684	860	860	3368	0	1591	1684	3744	1571	3267	5535	69
Grp Volume(v), veh/h	1	0	2	1208	0	454	2	887	722	553	489	244
Grp Sat Flow(s),veh/h/ln	1684	0	1720	1684	0	1591	1684	1872	1571	1633	1872	1860
Q Serve(g_s), s	0.1	0.0	0.1	39.5	0.0	20.4	0.1	25.3	29.5	18.6	9.4	9.4
Cycle Q Clear(g_c), s	0.1	0.0	0.1	39.5	0.0	20.4	0.1	25.3	29.5	18.6	9.4	9.4
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	13	0	14	1221	0	857	5	996	995	574	1644	817
V/C Ratio(X)	0.07	0.00	0.15	0.99	0.00	0.53	0.44	0.89	0.73	0.96	0.30	0.30
Avail Cap(c_a), veh/h	152	0	155	1221	0	857	76	996	995	574	1644	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	54.6	35.1	0.0	16.5	55.2	39.1	13.1	45.3	20.1	20.1
Incr Delay (d2), s/veh	0.9	0.0	1.8	23.1	0.0	0.6	23.0	11.8	4.6	28.1	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	22.2	0.0	9.1	0.1	14.7	23.1	10.6	4.9	5.0
LnGrp Delay(d),s/veh	55.5	0.0	56.4	58.3	0.0	17.1	78.2	51.0	17.7	73.5	20.5	21.0
LnGrp LOS	E		E	E		B	E	D	B	E	C	C
Approach Vol, veh/h		3			1662			1611			1286	
Approach Delay, s/veh		56.1			47.0			36.1			43.4	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	24.1	35.3		5.5	4.9	54.5		46.0
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	19.5	29.5		10.0	5.0	44.0		40.2
Max Q Clear Time (g_c+I1), s	20.6	31.5		2.1	2.1	11.4		41.5
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	6.9		0.0

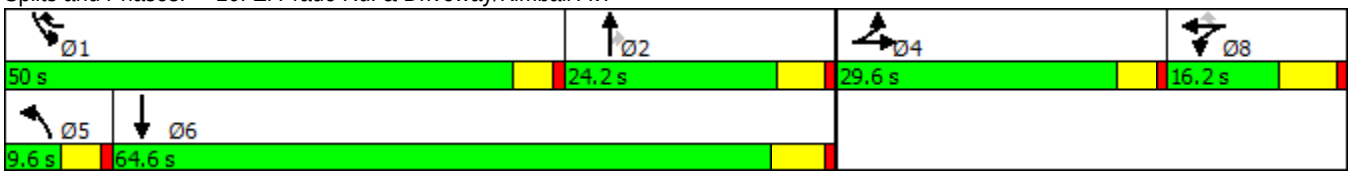
Intersection Summary	
HCM 2010 Ctrl Delay	42.2
HCM 2010 LOS	D

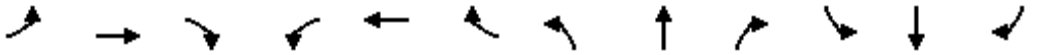
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	1	27	1333	5	293	33	939	213
Future Volume (vph)	12	1	27	1333	5	293	33	939	213
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	50.0	9.6	24.2	24.2	50.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	41.7%	8.0%	20.2%	20.2%	41.7%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.7	12.7	10.3	59.0	5.1	19.5	19.5	46.6	60.4
Actuated g/C Ratio	0.13	0.13	0.11	0.61	0.05	0.20	0.20	0.49	0.63
v/c Ratio	0.06	0.01	0.31	1.15	0.06	0.82	0.08	0.63	0.24
Control Delay	40.2	30.3	50.1	92.3	52.6	58.9	0.4	24.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	30.3	50.1	92.3	52.6	58.9	0.4	24.0	11.4
LOS	D	C	D	F	D	E	A	C	B
Approach Delay		38.2	90.6			52.9			21.3
Approach LOS		D	F			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 57.8	Intersection LOS: E
Intersection Capacity Utilization 123.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	2	29	27	1333	5	293	33	939	213	44
Future Volume (veh/h)	12	1	2	29	27	1333	5	293	33	939	213	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	1	1	30	28	499	5	299	34	958	217	45
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	55	28	28	122	114	728	109	370	314	1072	693	144
Arrive On Green	0.03	0.03	0.03	0.13	0.13	0.13	0.07	0.21	0.21	0.34	0.48	0.48
Sat Flow, veh/h	1619	827	827	908	847	1530	1619	1800	1530	3141	1447	300
Grp Volume(v), veh/h	12	0	2	58	0	499	5	299	34	958	0	262
Grp Sat Flow(s),veh/h/ln	1619	0	1654	1755	0	1530	1619	1800	1530	1570	0	1747
Q Serve(g_s), s	0.5	0.0	0.1	2.2	0.0	10.0	0.2	11.8	1.3	21.5	0.0	6.8
Cycle Q Clear(g_c), s	0.5	0.0	0.1	2.2	0.0	10.0	0.2	11.8	1.3	21.5	0.0	6.8
Prop In Lane	1.00		0.50	0.52		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	55	0	56	236	0	728	109	370	314	1072	0	837
V/C Ratio(X)	0.22	0.00	0.04	0.25	0.00	0.69	0.05	0.81	0.11	0.89	0.00	0.31
Avail Cap(c_a), veh/h	544	0	556	236	0	728	109	460	391	1918	0	1381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.0	0.0	34.7	28.8	0.0	15.2	32.4	28.1	24.0	23.2	0.0	11.9
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.5	0.0	2.7	0.1	8.5	0.2	1.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.1	0.0	8.4	0.1	6.7	0.6	9.5	0.0	3.3
LnGrp Delay(d),s/veh	37.0	0.0	35.0	29.3	0.0	17.8	32.5	36.6	24.2	24.3	0.0	12.1
LnGrp LOS	D		D	C		B	C	D	C	C		B
Approach Vol, veh/h		14			557			338			1220	
Approach Delay, s/veh		36.7			19.0			35.3			21.7	
Approach LOS		D			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	30.0	21.1		7.1	9.6	41.4		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	45.4	* 19		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	23.5	13.8		2.5	2.2	8.8		12.0
Green Ext Time (p_c), s	1.9	1.5		0.0	0.0	3.5		0.0

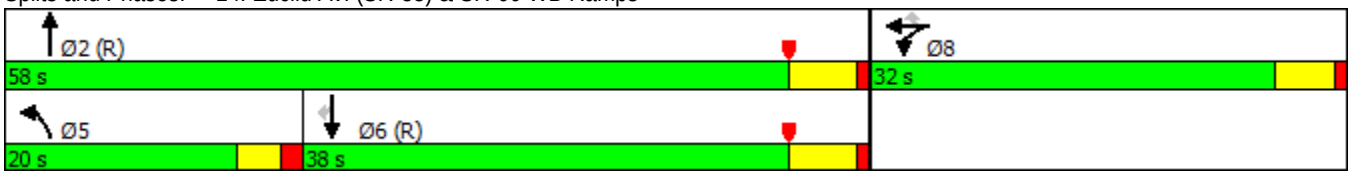
Intersection Summary	
HCM 2010 Ctrl Delay	23.3
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	843	2	393	478	1004	1090	499
Future Volume (vph)	843	2	393	478	1004	1090	499
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	32.0	32.0	32.0	20.0	58.0	38.0	38.0
Total Split (%)	35.6%	35.6%	35.6%	22.2%	64.4%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	27.0	27.0	27.0	15.5	52.5	32.5	32.5
Actuated g/C Ratio	0.30	0.30	0.30	0.17	0.58	0.36	0.36
v/c Ratio	1.04	1.00	0.77	0.95	0.54	0.95	0.61
Control Delay	86.7	75.8	33.5	54.4	18.3	45.0	5.3
Queue Delay	9.0	6.8	0.0	0.0	1.4	0.0	0.0
Total Delay	95.7	82.6	33.5	54.4	19.7	45.0	5.3
LOS	F	F	C	D	B	D	A
Approach Delay		73.3			30.9	32.5	
Approach LOS		E			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 50 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 43.7	Intersection LOS: D
Intersection Capacity Utilization 141.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	843	2	393	478	1004	0	0	1090	499
Future Volume (veh/h)	0	0	0	843	2	393	478	1004	0	0	1090	499
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				990	0	179	514	1080	0	0	1172	537
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				971	0	459	541	1995	0	0	1235	540
Arrive On Green				0.30	0.00	0.30	0.06	0.19	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3238	0	1530	3141	3510	0	0	3510	1496
Grp Volume(v), veh/h				990	0	179	514	1080	0	0	1172	537
Grp Sat Flow(s),veh/h/ln				1619	0	1530	1570	1710	0	0	1710	1496
Q Serve(g_s), s				27.0	0.0	8.3	14.7	25.6	0.0	0.0	30.0	32.2
Cycle Q Clear(g_c), s				27.0	0.0	8.3	14.7	25.6	0.0	0.0	30.0	32.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				971	0	459	541	1995	0	0	1235	540
V/C Ratio(X)				1.02	0.00	0.39	0.95	0.54	0.00	0.00	0.95	0.99
Avail Cap(c_a), veh/h				971	0	459	541	1995	0	0	1235	540
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.50	0.50	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.5	0.0	25.0	42.1	25.5	0.0	0.0	27.9	28.7
Incr Delay (d2), s/veh				33.8	0.0	0.2	16.7	0.5	0.0	0.0	16.0	37.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.6	0.0	3.6	7.7	12.3	0.0	0.0	16.7	18.9
LnGrp Delay(d),s/veh				65.3	0.0	25.2	58.7	26.0	0.0	0.0	43.9	65.9
LnGrp LOS				F		C	E	C			D	E
Approach Vol, veh/h					1169			1594			1709	
Approach Delay, s/veh					59.1			36.6			50.8	
Approach LOS					E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.0			20.0	38.0		32.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		52.5			15.5	32.5		27.0
Max Q Clear Time (g_c+I1), s		27.6			16.7	34.2		29.0
Green Ext Time (p_c), s		22.4			0.0	0.0		0.0

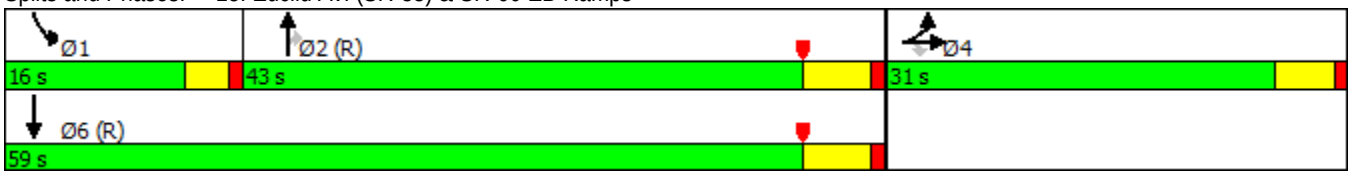
Intersection Summary	
HCM 2010 Ctrl Delay	47.9
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	351	0	690	1131	677	311	1623
Future Volume (vph)	351	0	690	1131	677	311	1623
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	31.0	31.0	31.0	43.0	43.0	16.0	59.0
Total Split (%)	34.4%	34.4%	34.4%	47.8%	47.8%	17.8%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	23.5	23.5	23.5	40.3	40.3	11.7	56.0
Actuated g/C Ratio	0.26	0.26	0.26	0.45	0.45	0.13	0.62
v/c Ratio	0.84	0.91	0.87	0.79	0.67	0.81	0.81
Control Delay	50.3	52.8	46.1	26.8	5.1	44.1	5.7
Queue Delay	0.4	0.7	0.0	0.0	0.0	0.0	2.3
Total Delay	50.7	53.5	46.1	26.8	5.1	44.1	8.0
LOS	D	D	D	C	A	D	A
Approach Delay		50.1		18.7			13.8
Approach LOS		D		B			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 23.5	Intersection LOS: C
Intersection Capacity Utilization 141.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	351	0	690	0	0	0	0	1131	677	311	1623	0
Future Volume (veh/h)	351	0	690	0	0	0	0	1131	677	311	1623	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	249	0	784				0	1203	720	331	1727	0
Adj No. of Lanes	1	0	2				0	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	449	0	848				0	1486	663	400	2073	0
Arrive On Green	0.28	0.00	0.28				0.00	0.43	0.43	0.04	0.20	0.00
Sat Flow, veh/h	1619	0	3060				0	3510	1526	3141	3510	0
Grp Volume(v), veh/h	249	0	784				0	1203	720	331	1727	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1526	1570	1710	0
Q Serve(g_s), s	11.8	0.0	22.4				0.0	27.6	39.1	9.4	43.6	0.0
Cycle Q Clear(g_c), s	11.8	0.0	22.4				0.0	27.6	39.1	9.4	43.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	449	0	848				0	1486	663	400	2073	0
V/C Ratio(X)	0.55	0.00	0.92				0.00	0.81	1.09	0.83	0.83	0.00
Avail Cap(c_a), veh/h	468	0	884				0	1486	663	419	2073	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.66	0.66	0.15	0.15	0.00
Uniform Delay (d), s/veh	27.8	0.0	31.6				0.0	22.2	25.5	42.1	31.6	0.0
Incr Delay (d2), s/veh	0.7	0.0	14.4				0.0	3.3	54.9	1.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	11.2				0.0	13.7	26.5	4.2	20.8	0.0
LnGrp Delay(d),s/veh	28.5	0.0	46.0				0.0	25.5	80.4	44.0	32.3	0.0
LnGrp LOS	C		D					C	F	D	C	
Approach Vol, veh/h		1033						1923			2058	
Approach Delay, s/veh		41.8						46.0			34.1	
Approach LOS		D						D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.5	44.6		29.9		60.1		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	12.0	37.5		26.0		53.5		
Max Q Clear Time (g_c+I1), s	11.4	41.1		24.4		45.6		
Green Ext Time (p_c), s	0.0	0.0		0.5		7.8		

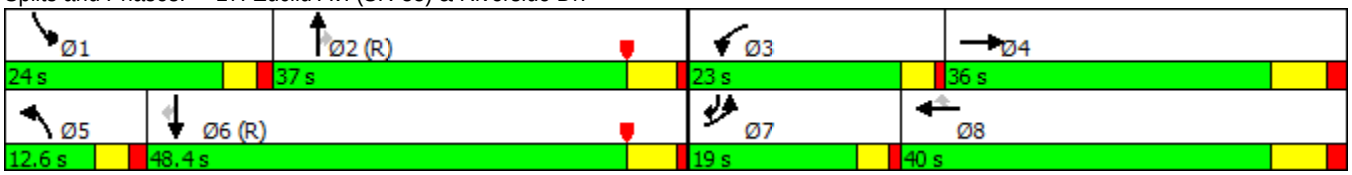
Intersection Summary	
HCM 2010 Ctrl Delay	40.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	150	344	193	404	53	67	1039	180	189	1273	156
Future Volume (vph)	150	344	193	404	53	67	1039	180	189	1273	156
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	19.0	36.0	23.0	40.0	40.0	12.6	37.0	37.0	24.0	48.4	19.0
Total Split (%)	15.8%	30.0%	19.2%	33.3%	33.3%	10.5%	30.8%	30.8%	20.0%	40.3%	15.8%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	14.0	21.7	17.4	25.1	25.1	9.5	41.0	41.0	18.9	52.6	72.1
Actuated g/C Ratio	0.12	0.18	0.14	0.21	0.21	0.08	0.34	0.34	0.16	0.44	0.60
v/c Ratio	0.84	0.69	0.87	0.59	0.13	0.55	0.65	0.29	0.79	0.62	0.17
Control Delay	86.9	50.0	82.9	45.7	0.6	61.0	32.0	11.1	46.6	19.5	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.9	50.0	82.9	45.7	0.6	61.0	32.0	11.1	46.6	19.5	6.3
LOS	F	D	F	D	A	E	C	B	D	B	A
Approach Delay		60.0		53.1			30.6			21.4	
Approach LOS		E		D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 68 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 74.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	344	60	193	404	53	67	1039	180	189	1273	156
Future Volume (veh/h)	150	344	60	193	404	53	67	1039	180	189	1273	156
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	158	362	40	203	425	51	71	1094	108	199	1340	98
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	182	543	60	227	694	310	89	1818	566	226	2236	868
Arrive On Green	0.11	0.17	0.17	0.14	0.20	0.20	0.02	0.12	0.12	0.05	0.15	0.15
Sat Flow, veh/h	1619	3103	341	1619	3420	1528	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	158	198	204	203	425	51	71	1094	108	199	1340	98
Grp Sat Flow(s),veh/h/ln	1619	1710	1734	1619	1710	1528	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	11.5	13.0	13.2	14.8	13.6	3.3	5.2	25.3	7.6	14.7	30.6	5.3
Cycle Q Clear(g_c), s	11.5	13.0	13.2	14.8	13.6	3.3	5.2	25.3	7.6	14.7	30.6	5.3
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	299	303	227	694	310	89	1818	566	226	2236	868
V/C Ratio(X)	0.87	0.66	0.67	0.89	0.61	0.16	0.80	0.60	0.19	0.88	0.60	0.11
Avail Cap(c_a), veh/h	202	413	419	256	941	420	109	1818	566	263	2236	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.63	0.63	0.38	0.38	0.38
Uniform Delay (d), s/veh	52.4	46.2	46.3	50.7	43.5	39.4	58.3	44.3	36.5	56.2	40.8	19.3
Incr Delay (d2), s/veh	26.9	3.6	3.6	26.5	1.3	0.4	19.2	0.9	0.5	11.3	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	6.4	6.6	8.3	6.6	1.4	2.8	11.6	3.3	7.3	14.0	2.3
LnGrp Delay(d),s/veh	79.3	49.8	49.9	77.2	44.8	39.8	77.4	45.2	37.0	67.6	41.2	19.4
LnGrp LOS	E	D	D	E	D	D	E	D	D	E	D	B
Approach Vol, veh/h		560			679			1273			1637	
Approach Delay, s/veh		58.2			54.1			46.3			43.1	
Approach LOS		E			D			D			D	

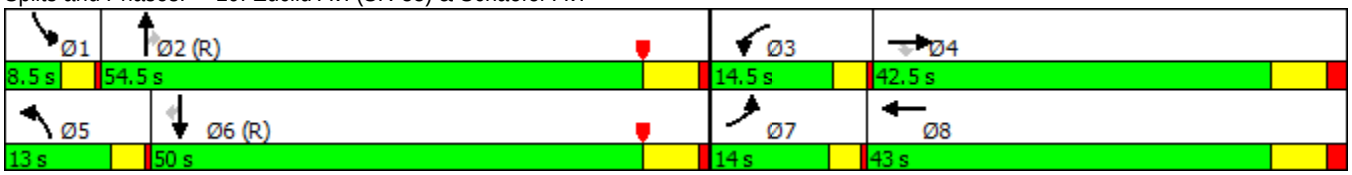
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.3	49.9	20.8	28.0	11.1	60.1	17.5	31.3
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	19.5	31.5	19.0	29.0	8.1	42.9	15.0	33.0
Max Q Clear Time (g_c+I1), s	16.7	27.3	16.8	15.2	7.2	32.6	13.5	15.6
Green Ext Time (p_c), s	0.1	3.8	0.1	5.6	0.0	8.9	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	47.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	63	129	63	123	124	1495	22	15	1850	137
Future Volume (vph)	145	63	129	63	123	124	1495	22	15	1850	137
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	42.5	42.5	14.5	43.0	13.0	54.5	54.5	8.5	50.0	50.0
Total Split (%)	11.7%	35.4%	35.4%	12.1%	35.8%	10.8%	45.4%	45.4%	7.1%	41.7%	41.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.5	20.6	20.6	10.4	17.8	15.4	71.5	71.5	5.4	56.3	56.3
Actuated g/C Ratio	0.09	0.17	0.17	0.09	0.15	0.13	0.60	0.60	0.04	0.47	0.47
v/c Ratio	1.09	0.22	0.36	0.48	0.56	0.64	0.54	0.02	0.22	0.85	0.19
Control Delay	153.4	43.1	8.8	64.1	51.6	40.0	21.6	2.4	81.7	11.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	153.4	43.1	8.8	64.1	51.6	40.0	21.6	2.4	81.7	11.6	0.5
LOS	F	D	A	E	D	D	C	A	F	B	A
Approach Delay		77.4			55.5		22.8			11.4	
Approach LOS		E			E		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 79.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	63	129	63	123	18	124	1495	22	15	1850	137
Future Volume (veh/h)	145	63	129	63	123	18	124	1495	22	15	1850	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	154	67	85	67	131	17	132	1590	18	16	1968	98
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	142	216	184	120	167	22	128	3055	951	28	2751	836
Arrive On Green	0.09	0.12	0.12	0.07	0.11	0.11	0.03	0.21	0.21	0.01	0.38	0.38
Sat Flow, veh/h	1619	1800	1530	1619	1562	203	1619	4914	1530	1619	4914	1494
Grp Volume(v), veh/h	154	67	85	67	0	148	132	1590	18	16	1968	98
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1764	1619	1638	1530	1619	1638	1494
Q Serve(g_s), s	10.5	4.1	6.2	4.8	0.0	9.8	9.5	34.6	1.1	1.2	41.1	5.1
Cycle Q Clear(g_c), s	10.5	4.1	6.2	4.8	0.0	9.8	9.5	34.6	1.1	1.2	41.1	5.1
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	142	216	184	120	0	189	128	3055	951	28	2751	836
V/C Ratio(X)	1.09	0.31	0.46	0.56	0.00	0.78	1.03	0.52	0.02	0.57	0.72	0.12
Avail Cap(c_a), veh/h	142	533	453	148	0	529	128	3055	951	67	2751	836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.62	0.62	0.62	0.11	0.11	0.11
Uniform Delay (d), s/veh	54.8	48.3	49.2	53.6	0.0	52.2	58.4	31.8	18.5	58.9	29.3	18.1
Incr Delay (d2), s/veh	100.8	0.6	1.3	1.5	0.0	5.3	70.5	0.4	0.0	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	2.1	2.7	2.2	0.0	5.0	6.8	15.8	0.5	0.5	18.6	2.1
LnGrp Delay(d),s/veh	155.6	48.9	50.5	55.1	0.0	57.5	129.3	32.2	18.5	59.6	29.5	18.1
LnGrp LOS	F	D	D	E		E	F	C	B	E	C	B
Approach Vol, veh/h		306			215			1740			2082	
Approach Delay, s/veh		103.0			56.8			39.4			29.2	
Approach LOS		F			E			D			C	

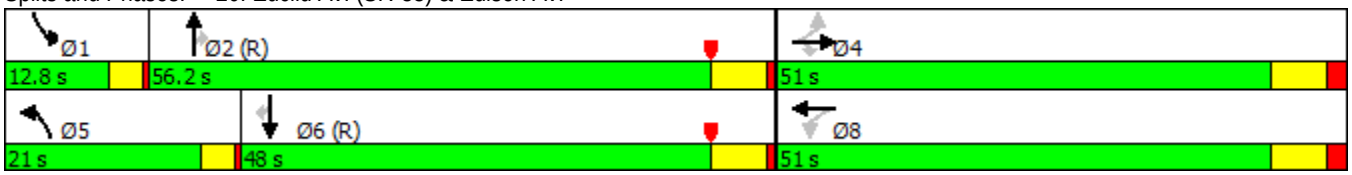
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	80.6	12.4	21.4	13.0	73.2	14.0	19.8
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	48.5	11.0	35.5	9.5	44.0	10.5	36.0
Max Q Clear Time (g_c+I1), s	3.2	36.6	6.8	8.2	11.5	43.1	12.5	11.8
Green Ext Time (p_c), s	0.0	11.4	0.0	1.0	0.0	0.9	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	222	172	260	74	356	259	1342	39	42	1701	257
Future Volume (vph)	222	172	260	74	356	259	1342	39	42	1701	257
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0	21.0	56.2	56.2	12.8	48.0	48.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%	17.5%	46.8%	46.8%	10.7%	40.0%	40.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.0	44.0	44.0	44.0	44.0	17.5	53.7	53.7	7.5	42.0	42.0
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.15	0.45	0.45	0.06	0.35	0.35
v/c Ratio	1.17	0.28	0.38	0.21	0.65	1.17	0.65	0.06	0.45	1.05	0.43
Control Delay	151.9	28.2	4.8	27.9	36.8	150.2	17.8	1.4	80.8	57.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	151.9	28.2	4.8	27.9	36.8	150.2	17.8	1.4	80.8	57.9	8.9
LOS	F	C	A	C	D	F	B	A	F	E	A
Approach Delay		60.8			35.4		38.4			52.1	
Approach LOS		E			D		D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 46.9	Intersection LOS: D
Intersection Capacity Utilization 107.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	172	260	74	356	41	259	1342	39	42	1701	257
Future Volume (veh/h)	222	172	260	74	356	41	259	1342	39	42	1701	257
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	236	183	210	79	379	42	276	1428	26	45	1810	242
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	216	660	561	340	584	65	236	2267	706	56	1720	535
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.29	0.92	0.92	0.05	0.47	0.47
Sat Flow, veh/h	926	1800	1530	951	1592	176	1619	4914	1530	1619	4914	1528
Grp Volume(v), veh/h	236	183	210	79	0	421	276	1428	26	45	1810	242
Grp Sat Flow(s),veh/h/ln	926	1800	1530	951	0	1769	1619	1638	1530	1619	1638	1528
Q Serve(g_s), s	20.3	8.6	12.1	7.7	0.0	23.7	17.5	6.4	0.2	3.3	42.0	12.9
Cycle Q Clear(g_c), s	44.0	8.6	12.1	16.3	0.0	23.7	17.5	6.4	0.2	3.3	42.0	12.9
Prop In Lane	1.00		1.00	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	216	660	561	340	0	649	236	2267	706	56	1720	535
V/C Ratio(X)	1.09	0.28	0.37	0.23	0.00	0.65	1.17	0.63	0.04	0.81	1.05	0.45
Avail Cap(c_a), veh/h	216	660	561	340	0	649	236	2267	706	125	1720	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.72	0.72	0.72	0.48	0.48	0.48
Uniform Delay (d), s/veh	52.7	26.8	27.9	32.5	0.0	31.6	42.5	2.7	2.5	56.9	32.1	24.3
Incr Delay (d2), s/veh	87.4	0.2	0.4	0.3	0.0	2.3	103.7	1.0	0.1	5.0	31.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	4.3	5.1	2.1	0.0	12.0	14.5	2.6	0.1	1.6	23.9	5.6
LnGrp Delay(d),s/veh	140.1	27.0	28.3	32.9	0.0	33.9	146.2	3.7	2.6	61.8	63.3	25.6
LnGrp LOS	F	C	C	C		C	F	A	A	E	F	C
Approach Vol, veh/h		629			500			1730			2097	
Approach Delay, s/veh		69.9			33.7			26.4			58.9	
Approach LOS		E			C			C			E	

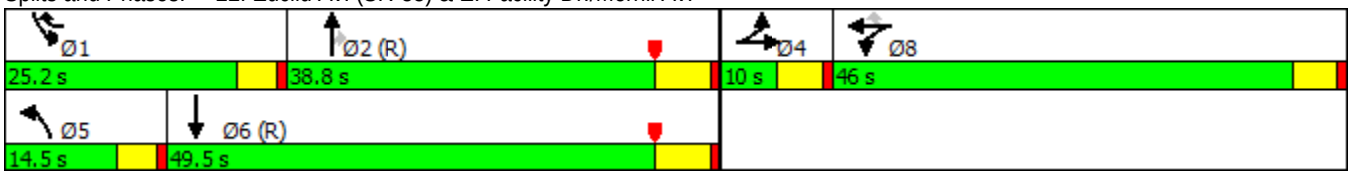
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	61.4		51.0	21.0	48.0		51.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.3	50.2		44.0	17.5	42.0		44.0
Max Q Clear Time (g_c+I1), s	5.3	8.4		46.0	19.5	44.0		25.7
Green Ext Time (p_c), s	0.0	34.5		0.0	0.0	0.0		5.6

Intersection Summary	
HCM 2010 Ctrl Delay	46.4
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	6	49	622	20	1122	186	484	1750
Future Volume (vph)	6	49	622	20	1122	186	484	1750
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	25.2	14.5	38.8	38.8	25.2	49.5
Total Split (%)	8.3%	38.3%	21.0%	12.1%	32.3%	32.3%	21.0%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	35.7	57.6	10.0	43.4	43.4	21.4	63.5
Actuated g/C Ratio	0.04	0.30	0.48	0.08	0.36	0.36	0.18	0.53
v/c Ratio	0.24	0.90	0.82	0.16	0.64	0.30	0.88	0.72
Control Delay	54.8	61.5	28.3	64.3	21.9	5.6	52.9	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	61.5	28.3	64.3	21.9	5.6	52.9	17.0
LOS	D	E	C	E	C	A	D	B
Approach Delay	54.8	42.1			20.3			24.6
Approach LOS	D	D			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 27.5	Intersection LOS: C
Intersection Capacity Utilization 90.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	6	4	394	49	622	20	1122	186	484	1750	45
Future Volume (veh/h)	8	6	4	394	49	622	20	1122	186	484	1750	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1872	1800	1768	1800	1800
Adj Flow Rate, veh/h	8	6	3	410	51	602	21	1169	168	504	1823	44
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	14	11	5	524	65	774	68	1537	460	552	2111	51
Arrive On Green	0.02	0.02	0.02	0.34	0.34	0.34	0.04	0.30	0.30	0.17	0.43	0.43
Sat Flow, veh/h	803	602	301	1533	191	1509	1619	5111	1530	3267	4936	119
Grp Volume(v), veh/h	17	0	0	461	0	602	21	1169	168	504	1210	657
Grp Sat Flow(s),veh/h/ln	1707	0	0	1723	0	1509	1619	1704	1530	1633	1638	1779
Q Serve(g_s), s	1.2	0.0	0.0	28.9	0.0	39.0	1.5	24.9	10.4	18.2	40.2	40.3
Cycle Q Clear(g_c), s	1.2	0.0	0.0	28.9	0.0	39.0	1.5	24.9	10.4	18.2	40.2	40.3
Prop In Lane	0.47		0.18	0.89		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	31	0	0	589	0	774	68	1537	460	552	1401	761
V/C Ratio(X)	0.55	0.00	0.00	0.78	0.00	0.78	0.31	0.76	0.37	0.91	0.86	0.86
Avail Cap(c_a), veh/h	71	0	0	589	0	774	135	1537	460	563	1401	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	35.5	0.0	23.9	55.8	38.0	33.0	49.0	31.2	31.2
Incr Delay (d2), s/veh	5.6	0.0	0.0	6.2	0.0	4.6	0.7	2.9	1.8	18.7	7.3	12.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	14.7	0.0	17.2	0.7	12.1	4.6	9.6	19.6	22.4
LnGrp Delay(d),s/veh	64.1	0.0	0.0	41.7	0.0	28.5	56.5	40.9	34.7	67.8	38.4	43.7
LnGrp LOS	E			D		C	E	D	C	E	D	D
Approach Vol, veh/h		17			1063			1358			2371	
Approach Delay, s/veh		64.1			34.3			40.4			46.1	
Approach LOS		E			C			D			D	

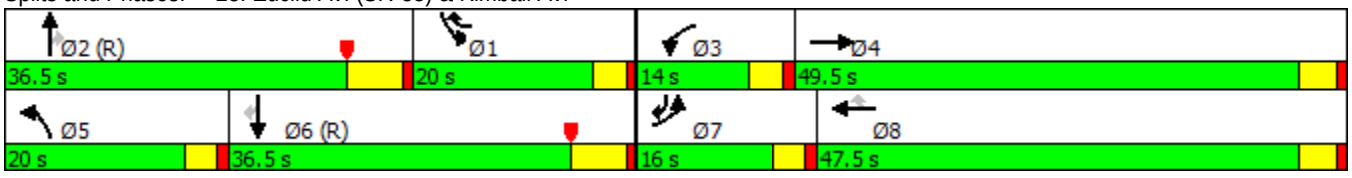
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	24.8	42.1		7.2	9.5	57.3		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	20.7	32.8		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	20.2	26.9		3.2	3.5	42.3		41.0
Green Ext Time (p_c), s	0.1	5.6		0.0	0.0	1.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	41.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	282	511	137	631	188	176	800	228	636	751	635
Future Volume (vph)	282	511	137	631	188	176	800	228	636	751	635
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	1	5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	9.0	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	16.0	49.5	14.0	47.5	20.0	20.0	36.5	36.5	20.0	36.5	16.0
Total Split (%)	13.3%	41.3%	11.7%	39.6%	16.7%	16.7%	30.4%	30.4%	16.7%	30.4%	13.3%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.0	31.4	10.0	29.4	52.7	17.0	37.3	37.3	22.8	43.1	57.1
Actuated g/C Ratio	0.10	0.26	0.08	0.24	0.44	0.14	0.31	0.31	0.19	0.36	0.48
v/c Ratio	0.92	0.64	1.04	0.77	0.26	0.79	0.53	0.37	1.09	0.43	0.82
Control Delay	87.9	41.3	143.4	48.1	6.4	48.9	29.5	11.1	103.4	27.9	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.9	41.3	143.4	48.1	6.4	48.9	29.5	11.1	103.4	27.9	33.1
LOS	F	D	F	D	A	D	C	B	F	C	C
Approach Delay		57.0		53.6			28.9			53.3	
Approach LOS		E		D			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 49 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 48.1	Intersection LOS: D
Intersection Capacity Utilization 81.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	282	511	46	137	631	188	176	800	228	636	751	635
Future Volume (veh/h)	282	511	46	137	631	188	176	800	228	636	751	635
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	288	521	45	140	644	170	180	816	225	649	766	610
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	314	824	71	135	828	793	206	1037	323	867	1851	722
Arrive On Green	0.10	0.26	0.26	0.08	0.24	0.24	0.04	0.07	0.07	0.28	0.38	0.38
Sat Flow, veh/h	3141	3187	275	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	288	279	287	140	644	170	180	816	225	649	766	610
Grp Sat Flow(s),veh/h/ln	1570	1710	1752	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	10.9	17.3	17.4	10.0	21.1	2.0	13.3	19.6	13.6	22.6	13.8	42.5
Cycle Q Clear(g_c), s	10.9	17.3	17.4	10.0	21.1	2.0	13.3	19.6	13.6	22.6	13.8	42.5
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	314	442	453	135	828	793	206	1037	323	867	1851	722
V/C Ratio(X)	0.92	0.63	0.63	1.04	0.78	0.21	0.87	0.79	0.70	0.75	0.41	0.84
Avail Cap(c_a), veh/h	314	641	657	135	1226	971	216	1249	389	867	1851	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	0.46	0.46	0.46	0.55	0.55	0.55
Uniform Delay (d), s/veh	53.5	39.4	39.4	55.0	42.5	5.8	56.5	53.2	32.4	39.6	27.6	27.6
Incr Delay (d2), s/veh	26.3	1.2	1.2	87.9	1.0	0.0	15.3	2.9	5.6	1.8	0.4	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	8.4	8.6	7.8	10.0	1.6	6.8	9.2	6.3	10.0	6.3	18.9
LnGrp Delay(d),s/veh	79.8	40.6	40.7	143.3	43.4	5.8	71.8	56.0	38.0	41.4	28.0	34.3
LnGrp LOS	E	D	D	F	D	A	E	E	D	D	C	C
Approach Vol, veh/h		854			954			1221			2025	
Approach Delay, s/veh		53.8			51.4			55.0			34.2	
Approach LOS		D			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.1	31.3	14.0	35.5	19.2	51.2	16.0	33.5
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	16.0	* 31	10.0	45.0	16.0	30.5	12.0	43.0
Max Q Clear Time (g_c+I1), s	24.6	21.6	12.0	19.4	15.3	44.5	12.9	23.1
Green Ext Time (p_c), s	0.0	3.7	0.0	6.4	0.0	0.0	0.0	5.9

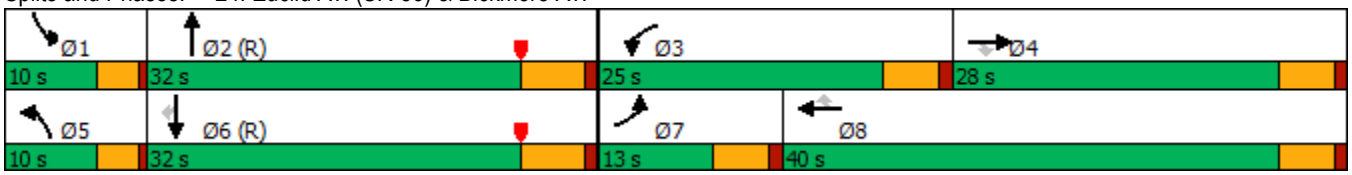
Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

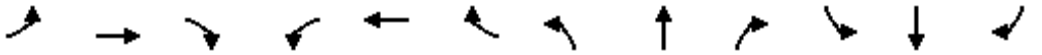
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	87	28	52	309	419	263	80	823	85	703	113
Future Volume (vph)	87	28	52	309	419	263	80	823	85	703	113
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	28.0	28.0	10.0	28.0	28.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.0	28.0	28.0	25.0	40.0	40.0	10.0	32.0	10.0	32.0	32.0
Total Split (%)	13.7%	29.5%	29.5%	26.3%	42.1%	42.1%	10.5%	33.7%	10.5%	33.7%	33.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	8.1	14.7	14.7	21.7	28.4	28.4	8.2	33.1	8.5	33.4	33.4
Actuated g/C Ratio	0.09	0.15	0.15	0.23	0.30	0.30	0.09	0.35	0.09	0.35	0.35
v/c Ratio	0.67	0.11	0.14	0.89	0.83	0.45	0.61	0.63	0.62	0.43	0.18
Control Delay	66.6	31.3	0.8	64.0	44.2	7.6	62.4	28.5	62.7	26.6	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	31.3	0.8	64.0	44.2	7.6	62.4	28.5	62.7	26.6	1.8
LOS	E	C	A	E	D	A	E	C	E	C	A
Approach Delay		40.3			40.7			31.0		26.9	
Approach LOS		D			D			C		C	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 10 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 33.4	Intersection LOS: C
Intersection Capacity Utilization 71.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	28	52	309	419	263	80	823	181	85	703	113
Future Volume (veh/h)	87	28	52	309	419	263	80	823	181	85	703	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	93	30	53	329	446	267	85	876	192	90	748	111
Adj No. of Lanes	1	1	1	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	125	258	219	341	498	423	105	1525	333	111	1871	583
Arrive On Green	0.08	0.14	0.14	0.21	0.28	0.28	0.07	0.38	0.38	0.07	0.38	0.38
Sat Flow, veh/h	1619	1800	1527	1619	1800	1530	1619	4040	881	1619	4914	1530
Grp Volume(v), veh/h	93	30	53	329	446	267	85	710	358	90	748	111
Grp Sat Flow(s),veh/h/ln	1619	1800	1527	1619	1800	1530	1619	1638	1645	1619	1638	1530
Q Serve(g_s), s	5.3	1.4	2.9	19.1	22.6	14.5	4.9	16.3	16.5	5.2	10.6	4.6
Cycle Q Clear(g_c), s	5.3	1.4	2.9	19.1	22.6	14.5	4.9	16.3	16.5	5.2	10.6	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	125	258	219	341	498	423	105	1237	621	111	1871	583
V/C Ratio(X)	0.74	0.12	0.24	0.97	0.90	0.63	0.81	0.57	0.58	0.81	0.40	0.19
Avail Cap(c_a), veh/h	136	436	370	341	663	564	111	1237	621	111	1871	583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.70	0.70	0.70
Uniform Delay (d), s/veh	42.9	35.4	36.1	37.2	33.0	30.1	43.8	23.5	23.5	43.6	21.5	19.6
Incr Delay (d2), s/veh	15.2	0.1	0.2	39.2	10.1	0.6	3.5	0.2	0.4	25.0	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.7	1.2	12.2	12.7	6.2	2.3	7.4	7.5	3.1	4.9	2.0
LnGrp Delay(d),s/veh	58.1	35.5	36.3	76.3	43.2	30.7	47.3	23.7	23.9	68.6	21.9	20.1
LnGrp LOS	E	D	D	E	D	C	D	C	C	E	C	C
Approach Vol, veh/h		176			1042			1153			949	
Approach Delay, s/veh		47.7			50.4			25.5			26.1	
Approach LOS		D			D			C			C	

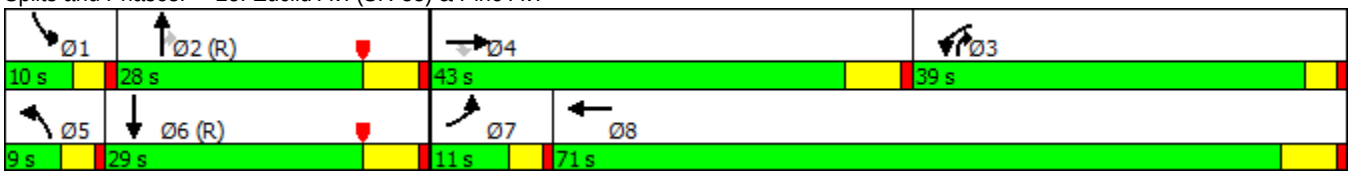
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	41.4	25.0	18.6	9.7	41.7	12.3	31.3
Change Period (Y+Rc), s	3.5	5.5	5.0	5.0	3.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	6.5	26.5	20.0	23.0	6.5	26.5	8.0	35.0
Max Q Clear Time (g_c+I1), s	7.2	18.5	21.1	4.9	6.9	12.6	7.3	24.6
Green Ext Time (p_c), s	0.0	2.7	0.0	0.1	0.0	2.7	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	5	227	34	915	173	60	1027	516	92	950
Future Volume (vph)	5	227	34	915	173	60	1027	516	92	950
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	11.0	43.0	43.0	39.0	71.0	9.0	28.0	39.0	10.0	29.0
Total Split (%)	9.2%	35.8%	35.8%	32.5%	59.2%	7.5%	23.3%	32.5%	8.3%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.3	23.2	23.2	45.0	70.2	7.3	22.0	69.0	9.8	24.5
Actuated g/C Ratio	0.04	0.19	0.19	0.38	0.58	0.06	0.18	0.58	0.08	0.20
v/c Ratio	0.07	0.66	0.09	0.84	0.31	0.62	1.15	0.50	0.71	0.97
Control Delay	57.0	52.6	0.4	42.8	11.4	68.5	107.8	2.3	70.2	53.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	52.6	0.4	42.8	11.4	68.5	107.8	2.3	70.2	53.5
LOS	E	D	A	D	B	E	F	A	E	D
Approach Delay		46.1			34.9		72.4			54.9
Approach LOS		D			C		E			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 40 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 55.2	Intersection LOS: E
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	227	34	915	173	135	60	1027	516	92	950	15
Future Volume (veh/h)	5	227	34	915	173	135	60	1027	516	92	950	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	5	229	0	924	175	121	61	1037	343	93	960	10
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	10	275	234	862	449	310	67	1583	928	81	1656	17
Arrive On Green	0.01	0.15	0.00	0.29	0.45	0.45	0.04	0.32	0.32	0.02	0.11	0.11
Sat Flow, veh/h	1619	1800	1530	2956	987	682	1619	4914	1496	1619	5013	52
Grp Volume(v), veh/h	5	229	0	924	0	296	61	1037	343	93	627	343
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1669	1619	1638	1496	1619	1638	1789
Q Serve(g_s), s	0.4	14.8	0.0	35.0	0.0	14.1	4.5	21.8	3.0	6.0	21.8	21.9
Cycle Q Clear(g_c), s	0.4	14.8	0.0	35.0	0.0	14.1	4.5	21.8	3.0	6.0	21.8	21.9
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	10	275	234	862	0	759	67	1583	928	81	1082	591
V/C Ratio(X)	0.48	0.83	0.00	1.07	0.00	0.39	0.90	0.66	0.37	1.15	0.58	0.58
Avail Cap(c_a), veh/h	94	555	472	862	0	904	67	1583	928	81	1082	591
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.77	0.77	0.77
Uniform Delay (d), s/veh	59.4	49.3	0.0	42.5	0.0	21.7	57.3	34.9	3.7	59.0	45.5	45.5
Incr Delay (d2), s/veh	12.4	8.9	0.0	51.7	0.0	0.5	14.1	0.2	0.1	133.3	1.7	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.1	0.0	20.4	0.0	6.6	2.3	9.8	2.9	5.7	10.2	11.4
LnGrp Delay(d),s/veh	71.8	58.2	0.0	94.2	0.0	22.1	71.3	35.1	3.8	192.3	47.3	48.7
LnGrp LOS	E	E		F		C	E	D	A	F	D	D
Approach Vol, veh/h		234			1220			1441			1063	
Approach Delay, s/veh		58.5			76.7			29.2			60.4	
Approach LOS		E			E			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	44.6	41.0	24.4	9.0	45.6	4.8	60.6
Change Period (Y+Rc), s	4.0	6.0	6.0	* 6	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	22.0	35.0	* 37	5.0	23.0	7.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	23.8	37.0	16.8	6.5	23.9	2.4	16.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	0.0	0.0	4.3

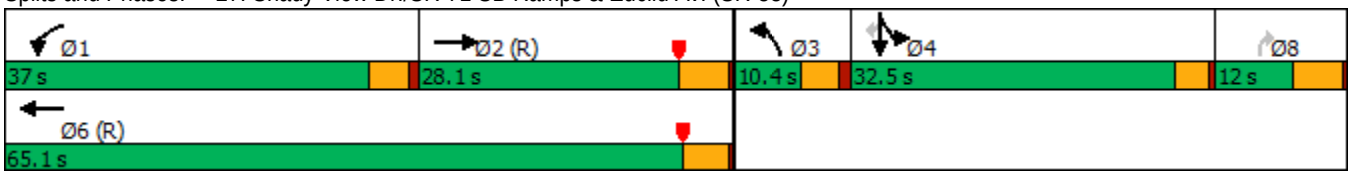
Intersection Summary	
HCM 2010 Ctrl Delay	54.0
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	845	412	253	64	312	282	22	37
Future Volume (vph)	845	412	253	64	312	282	22	37
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.1	37.0	65.1	10.4	12.0	32.5	32.5	32.5
Total Split (%)	23.4%	30.8%	54.3%	8.7%	10.0%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	26.0	39.8	70.8	5.9	7.2	18.6	18.6	18.6
Actuated g/C Ratio	0.22	0.33	0.59	0.05	0.06	0.16	0.16	0.16
v/c Ratio	1.28	0.85	0.14	0.89	0.83	0.64	0.09	0.11
Control Delay	175.6	28.6	4.8	130.3	23.2	52.9	41.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	175.6	28.6	4.8	130.3	23.2	52.9	41.0	0.6
LOS	F	C	A	F	C	D	D	A
Approach Delay	175.6		19.6				46.4	
Approach LOS	F		B				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 93.7 (78%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 87.2	Intersection LOS: F
Intersection Capacity Utilization 74.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	845	17	412	253	0	64	0	312	282	22	37
Future Volume (veh/h)	0	845	17	412	253	0	64	0	312	282	22	37
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	929	19	453	278	0	70	0	343	310	24	41
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1709	35	438	2760	0	0	0	0	384	220	187
Arrive On Green	0.00	0.50	0.50	0.45	1.00	0.00	0.00	0.00	0.00	0.12	0.12	0.12
Sat Flow, veh/h	0	3518	70	1619	3510	0		0		3141	1800	1530
Grp Volume(v), veh/h	0	463	485	453	278	0		0.0		310	24	41
Grp Sat Flow(s),veh/h/ln	0	1710	1788	1619	1710	0				1570	1800	1530
Q Serve(g_s), s	0.0	22.4	22.4	32.5	0.0	0.0				11.5	1.4	2.9
Cycle Q Clear(g_c), s	0.0	22.4	22.4	32.5	0.0	0.0				11.5	1.4	2.9
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	853	891	438	2760	0				384	220	187
V/C Ratio(X)	0.00	0.54	0.54	1.03	0.10	0.00				0.81	0.11	0.22
Avail Cap(c_a), veh/h	0	853	891	438	2760	0				759	435	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	20.7	20.7	32.9	0.0	0.0				51.3	46.9	47.5
Incr Delay (d2), s/veh	0.0	2.5	2.4	51.8	0.1	0.0				4.1	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.1	11.6	20.7	0.0	0.0				5.2	0.7	1.3
LnGrp Delay(d),s/veh	0.0	23.2	23.1	84.6	0.1	0.0				55.4	47.1	48.1
LnGrp LOS		C	C	F	A					E	D	D
Approach Vol, veh/h		948			731						375	
Approach Delay, s/veh		23.1			52.5						54.0	
Approach LOS		C			D						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	37.0	64.8		18.2		101.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	32.5	23.1		29.0		* 61		
Max Q Clear Time (g_c+I1), s	34.5	24.4		13.5		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.1		1.4		

Intersection Summary	
HCM 2010 Ctrl Delay	39.2
HCM 2010 LOS	D

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1169	215	16	1038	41	3
Future Volume (vph)	1169	215	16	1038	41	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.2	24.2	9.6	24.2	32.1	32.1
Total Split (s)	57.9	57.9	10.0	67.9	32.1	32.1
Total Split (%)	57.9%	57.9%	10.0%	67.9%	32.1%	32.1%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	31.6	31.6	5.7	32.8	13.1	13.1
Actuated g/C Ratio	0.54	0.54	0.10	0.56	0.22	0.22
v/c Ratio	0.69	0.25	0.11	0.59	0.12	0.01
Control Delay	12.8	2.3	35.7	9.5	23.3	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	2.3	35.7	9.5	23.3	17.0
LOS	B	A	D	A	C	B
Approach Delay	11.2			9.9	22.9	
Approach LOS	B			A	C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 58.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1169	215	16	1038	41	3
Future Volume (veh/h)	1169	215	16	1038	41	3
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1271	234	17	1128	45	3
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2057	920	33	2356	237	224
Arrive On Green	0.60	0.60	0.02	0.69	0.15	0.15
Sat Flow, veh/h	3510	1530	1619	3510	1619	1530
Grp Volume(v), veh/h	1271	234	17	1128	45	3
Grp Sat Flow(s),veh/h/ln	1710	1530	1619	1710	1619	1530
Q Serve(g_s), s	16.1	4.9	0.7	10.5	1.7	0.1
Cycle Q Clear(g_c), s	16.1	4.9	0.7	10.5	1.7	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2057	920	33	2356	237	224
V/C Ratio(X)	0.62	0.25	0.52	0.48	0.19	0.01
Avail Cap(c_a), veh/h	2584	1156	128	3083	639	604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.7	6.4	33.2	4.9	25.7	25.0
Incr Delay (d2), s/veh	0.3	0.1	4.7	0.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	2.1	0.4	4.9	0.8	0.1
LnGrp Delay(d),s/veh	9.0	6.6	37.9	5.1	26.0	25.0
LnGrp LOS	A	A	D	A	C	C
Approach Vol, veh/h	1505			1145	48	
Approach Delay, s/veh	8.6			5.6	26.0	
Approach LOS	A			A	C	

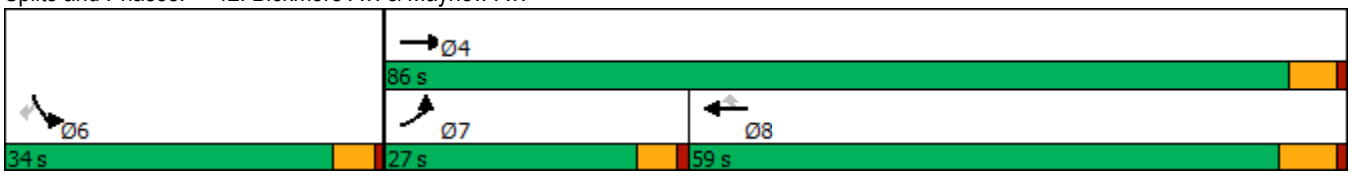
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.0	47.4				53.3		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.4	51.7				61.7		27.0
Max Q Clear Time (g_c+I1), s	2.7	18.1				12.5		3.7
Green Ext Time (p_c), s	0.0	23.0				29.3		0.1

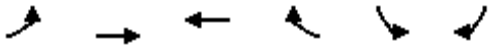
Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	153	162	1030	22	6	20
Future Volume (vph)	153	162	1030	22	6	20
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phase	7	4	8	8	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	15.4	23.2	23.2	31.7	31.7
Total Split (s)	27.0	86.0	59.0	59.0	34.0	34.0
Total Split (%)	22.5%	71.7%	49.2%	49.2%	28.3%	28.3%
Yellow Time (s)	3.6	4.4	5.2	5.2	3.7	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	6.2	6.2	4.7	4.7
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	13.4	53.0	33.8	33.8	12.9	12.9
Actuated g/C Ratio	0.17	0.69	0.44	0.44	0.17	0.17
v/c Ratio	0.59	0.07	0.74	0.03	0.03	0.08
Control Delay	41.6	4.2	22.1	6.5	32.5	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	4.2	22.1	6.5	32.5	14.8
LOS	D	A	C	A	C	B
Approach Delay		22.3	21.8		19.1	
Approach LOS		C	C		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 76.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 60.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 42: Bickmore Av. & Mayhew Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	153	162	1030	22	6	20
Future Volume (veh/h)	153	162	1030	22	6	20
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1700	1800
Adj Flow Rate, veh/h	166	176	1120	24	7	22
Adj No. of Lanes	1	2	2	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	206	2247	1553	695	266	251
Arrive On Green	0.13	0.66	0.45	0.45	0.16	0.16
Sat Flow, veh/h	1619	3510	3510	1530	1619	1530
Grp Volume(v), veh/h	166	176	1120	24	7	22
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1530	1619	1530
Q Serve(g_s), s	6.1	1.1	16.2	0.5	0.2	0.7
Cycle Q Clear(g_c), s	6.1	1.1	16.2	0.5	0.2	0.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	206	2247	1553	695	266	251
V/C Ratio(X)	0.81	0.08	0.72	0.03	0.03	0.09
Avail Cap(c_a), veh/h	595	4525	2964	1326	779	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	3.8	13.5	9.2	21.4	21.6
Incr Delay (d2), s/veh	2.8	0.0	0.6	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.5	7.8	0.2	0.1	0.3
LnGrp Delay(d),s/veh	28.7	3.8	14.1	9.2	21.4	21.7
LnGrp LOS	C	A	B	A	C	C
Approach Vol, veh/h		342	1144		29	
Approach Delay, s/veh		15.9	14.0		21.7	
Approach LOS		B	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				46.2		14.7	12.3	33.9
Change Period (Y+Rc), s				* 6.2		4.7	4.6	6.2
Max Green Setting (Gmax), s				* 81		29.3	22.4	52.8
Max Q Clear Time (g_c+I1), s				3.1		2.7	8.1	18.2
Green Ext Time (p_c), s				1.1		0.0	0.2	9.5

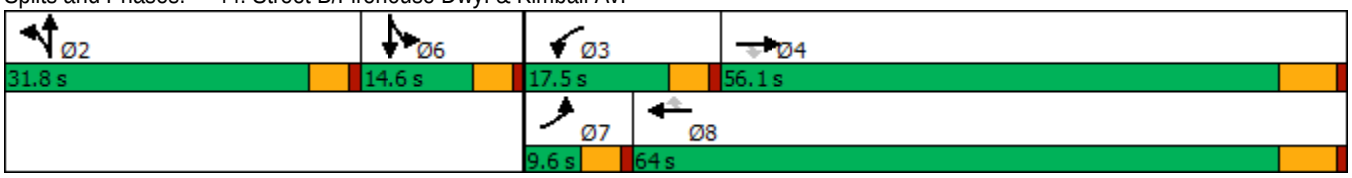
Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	3	995	266	79	1412	0	0
Future Volume (vph)	3	995	266	79	1412	0	0
Turn Type	Prot	NA	Perm	Prot	NA	NA	NA
Protected Phases	7	4		3	8	2	6
Permitted Phases			4				
Detector Phase	7	4	4	3	8	2	6
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	23.2	9.6	16.2	31.6	14.6
Total Split (s)	9.6	56.1	56.1	17.5	64.0	31.8	14.6
Total Split (%)	8.0%	46.8%	46.8%	14.6%	53.3%	26.5%	12.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	Max	None	None
Act Effct Green (s)	5.1	57.5	57.5	8.7	67.2	12.8	10.2
Actuated g/C Ratio	0.06	0.64	0.64	0.10	0.75	0.14	0.11
v/c Ratio	0.03	0.47	0.24	0.53	0.61	0.19	0.00
Control Delay	48.3	14.7	5.7	53.3	12.0	1.0	44.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	14.7	5.7	53.3	12.0	1.0	44.0
LOS	D	B	A	D	B	A	D
Approach Delay		12.9			14.2	1.0	44.0
Approach LOS		B			B	A	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 89.9	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	995	266	79	1412	0	59	0	6	1	0	0
Future Volume (veh/h)	3	995	266	79	1412	0	59	0	6	1	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	3	1093	182	87	1552	0	65	0	7	1	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	2175	924	109	2282	1021	145	0	16	5	0	0
Arrive On Green	0.00	0.60	0.60	0.07	0.67	0.00	0.10	0.00	0.10	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	3420	1530	1530	0	165	1714	0	0
Grp Volume(v), veh/h	3	1093	182	87	1552	0	72	0	0	1	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1710	1530	1694	0	0	1714	0	0
Q Serve(g_s), s	0.2	14.9	4.6	4.6	23.9	0.0	3.5	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.2	14.9	4.6	4.6	23.9	0.0	3.5	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.90		0.10	1.00		0.00
Lane Grp Cap(c), veh/h	7	2175	924	109	2282	1021	161	0	0	5	0	0
V/C Ratio(X)	0.46	0.50	0.20	0.80	0.68	0.00	0.45	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	93	2175	924	241	2282	1021	532	0	0	198	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	43.0	9.7	7.7	39.8	8.8	0.0	37.0	0.0	0.0	43.1	0.0	0.0
Incr Delay (d2), s/veh	17.7	0.8	0.5	5.1	1.7	0.0	1.9	0.0	0.0	21.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	7.5	2.0	2.2	11.7	0.0	1.7	0.0	0.0	0.1	0.0	0.0
LnGrp Delay(d),s/veh	60.7	10.6	8.2	44.9	10.4	0.0	39.0	0.0	0.0	64.2	0.0	0.0
LnGrp LOS	E	B	A	D	B		D			E		
Approach Vol, veh/h		1278			1639			72			1	
Approach Delay, s/veh		10.3			12.3			39.0			64.1	
Approach LOS		B			B			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.8	10.4	58.5		4.8	4.9	64.0
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		27.2	12.9	49.9		10.0	5.0	57.8
Max Q Clear Time (g_c+I1), s		5.5	6.6	16.9		2.1	2.2	25.9
Green Ext Time (p_c), s		0.3	0.0	9.1		0.0	0.0	13.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	408	419	5	504	20	20	97	13
Future Volume (vph)	408	419	5	504	20	20	97	13
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	31.0	48.8	9.6	27.4	31.6	31.6	31.6	31.6
Total Split (%)	34.4%	54.2%	10.7%	30.4%	35.1%	35.1%	35.1%	35.1%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	24.7	47.6	5.1	20.0		24.2		24.2
Actuated g/C Ratio	0.29	0.56	0.06	0.24		0.29		0.29
v/c Ratio	0.91	0.24	0.05	0.85		0.15		0.87
Control Delay	55.6	10.7	41.6	43.7		24.4		52.4
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	55.6	10.7	41.6	43.7		24.4		52.4
LOS	E	B	D	D		C		D
Approach Delay		32.5		43.7		24.4		52.4
Approach LOS		C		D		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 84.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 39.7	Intersection LOS: D
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	408	419	12	5	504	126	20	20	18	97	13	233
Future Volume (veh/h)	408	419	12	5	504	126	20	20	18	97	13	233
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	429	441	13	5	531	133	21	21	19	102	14	245
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	464	1775	52	11	657	164	156	151	111	157	34	280
Arrive On Green	0.29	0.52	0.52	0.01	0.24	0.24	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1619	3390	100	1619	2699	673	346	554	407	360	126	1026
Grp Volume(v), veh/h	429	222	232	5	335	329	61	0	0	361	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1780	1619	1710	1662	1308	0	0	1512	0	0
Q Serve(g_s), s	20.1	5.6	5.6	0.2	14.4	14.5	0.0	0.0	0.0	14.6	0.0	0.0
Cycle Q Clear(g_c), s	20.1	5.6	5.6	0.2	14.4	14.5	2.1	0.0	0.0	17.8	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.40	0.34		0.31	0.28		0.68
Lane Grp Cap(c), veh/h	464	895	932	11	416	405	419	0	0	471	0	0
V/C Ratio(X)	0.92	0.25	0.25	0.47	0.81	0.81	0.15	0.00	0.00	0.77	0.00	0.00
Avail Cap(c_a), veh/h	548	933	971	104	464	451	524	0	0	581	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	27.0	10.2	10.2	38.6	27.8	27.8	21.4	0.0	0.0	27.0	0.0	0.0
Incr Delay (d2), s/veh	18.5	0.1	0.1	11.4	9.2	9.9	0.2	0.0	0.0	4.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	2.6	2.7	0.1	7.9	7.8	1.0	0.0	0.0	8.1	0.0	0.0
LnGrp Delay(d),s/veh	45.5	10.3	10.3	50.1	36.9	37.7	21.6	0.0	0.0	31.9	0.0	0.0
LnGrp LOS	D	B	B	D	D	D	C			C		
Approach Vol, veh/h		883			669			61			361	
Approach Delay, s/veh		27.4			37.4			21.6			31.9	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	47.1		25.9	27.0	25.2		25.9
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	42.6		27.0	26.4	21.2		27.0
Max Q Clear Time (g_c+I1), s	2.2	7.6		19.8	22.1	16.5		4.1
Green Ext Time (p_c), s	0.0	6.9		1.5	0.3	2.5		2.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.4
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	232	201	325	473	123	260
Future Volume (vph)	232	201	325	473	123	260
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	24.0	56.8	32.8	32.8
Total Split (%)	36.9%	36.9%	26.7%	63.1%	36.4%	36.4%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	15.6	14.0	20.1	37.8	13.0	13.0
Actuated g/C Ratio	0.24	0.22	0.31	0.59	0.20	0.20
v/c Ratio	0.64	0.43	0.69	0.48	0.36	0.52
Control Delay	30.1	6.5	31.9	10.2	25.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	6.5	31.9	10.2	25.5	7.2
LOS	C	A	C	B	C	A
Approach Delay				19.0	13.1	
Approach LOS				B	B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 64.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 17.6 — Intersection LOS: B
Intersection Capacity Utilization 54.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	232	0	201	0	0	0	325	473	0	0	123	260
Future Volume (veh/h)	232	0	201	0	0	0	325	473	0	0	123	260
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	249	0	216				349	509	0	0	132	280
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	316	0	298				402	1100	0	0	500	425
Arrive On Green	0.20	0.00	0.20				0.25	0.61	0.00	0.00	0.28	0.28
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1530
Grp Volume(v), veh/h	249	0	216				349	509	0	0	132	280
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1530
Q Serve(g_s), s	7.9	0.0	7.1				11.1	8.2	0.0	0.0	3.1	8.7
Cycle Q Clear(g_c), s	7.9	0.0	7.1				11.1	8.2	0.0	0.0	3.1	8.7
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	316	0	298				402	1100	0	0	500	425
V/C Ratio(X)	0.79	0.00	0.72				0.87	0.46	0.00	0.00	0.26	0.66
Avail Cap(c_a), veh/h	862	0	814				585	1708	0	0	904	769
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	0.0	20.3				19.4	5.7	0.0	0.0	15.1	17.2
Incr Delay (d2), s/veh	1.7	0.0	1.3				6.9	0.3	0.0	0.0	0.3	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	5.9				5.7	4.1	0.0	0.0	1.5	7.3
LnGrp Delay(d),s/veh	22.2	0.0	21.5				26.3	6.0	0.0	0.0	15.4	18.9
LnGrp LOS	C		C				C	A			B	B
Approach Vol, veh/h		465						858			412	
Approach Delay, s/veh		21.9						14.2			17.8	
Approach LOS		C						B			B	

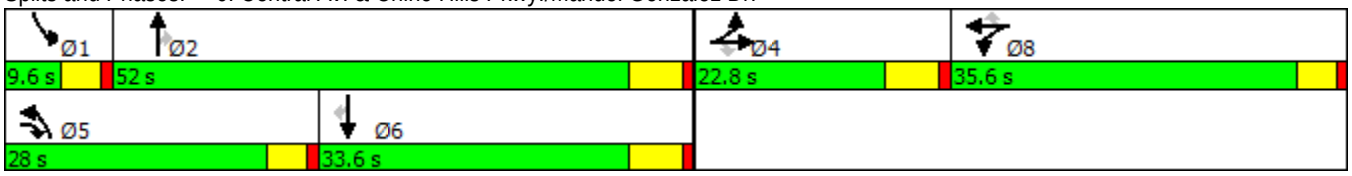
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		38.7		15.1	17.9	20.7		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		51.0		28.6	19.4	27.0		
Max Q Clear Time (g_c+I1), s		10.2		9.9	13.1	10.7		
Green Ext Time (p_c), s		5.1		0.6	0.3	4.2		

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	2	447	12	43	35	396	792	1	11	881	240
Future Volume (vph)	514	2	447	12	43	35	396	792	1	11	881	240
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	5	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	22.8	22.8	28.0	35.6	35.6	35.6	28.0	52.0	52.0	9.6	33.6	33.6
Total Split (%)	19.0%	19.0%	23.3%	29.7%	29.7%	29.7%	23.3%	43.3%	43.3%	8.0%	28.0%	28.0%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	17.2	17.2	43.2	13.6	13.6	13.6	23.7	54.9	54.9	5.1	28.2	28.2
Actuated g/C Ratio	0.17	0.17	0.43	0.14	0.14	0.14	0.24	0.55	0.55	0.05	0.28	0.28
v/c Ratio	1.06	1.01	0.52	0.06	0.19	0.11	1.13	0.46	0.00	0.15	1.00	0.49
Control Delay	115.1	100.6	3.3	37.7	40.4	0.7	123.5	17.6	0.0	54.5	66.5	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.1	100.6	3.3	37.7	40.4	0.7	123.5	17.6	0.0	54.5	66.5	17.8
LOS	F	F	A	D	D	A	F	B	A	D	E	B
Approach Delay		59.3			24.6			52.8			56.0	
Approach LOS		E			C			D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 55.0	Intersection LOS: D
Intersection Capacity Utilization 86.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	514	2	447	12	43	35	396	792	1	11	881	240
Future Volume (veh/h)	514	2	447	12	43	35	396	792	1	11	881	240
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	560	0	358	13	47	21	430	861	1	12	958	191
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	559	0	627	156	174	147	385	1729	773	23	965	426
Arrive On Green	0.17	0.00	0.17	0.10	0.10	0.10	0.24	0.51	0.51	0.01	0.28	0.28
Sat Flow, veh/h	3238	0	1530	1619	1800	1521	1619	3420	1528	1619	3420	1509
Grp Volume(v), veh/h	560	0	358	13	47	21	430	861	1	12	958	191
Grp Sat Flow(s),veh/h/ln	1619	0	1530	1619	1800	1521	1619	1710	1528	1619	1710	1509
Q Serve(g_s), s	17.0	0.0	17.0	0.7	2.4	1.2	23.4	16.4	0.0	0.7	27.5	10.2
Cycle Q Clear(g_c), s	17.0	0.0	17.0	0.7	2.4	1.2	23.4	16.4	0.0	0.7	27.5	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	559	0	627	156	174	147	385	1729	773	23	965	426
V/C Ratio(X)	1.00	0.00	0.57	0.08	0.27	0.14	1.12	0.50	0.00	0.52	0.99	0.45
Avail Cap(c_a), veh/h	559	0	627	509	566	479	385	1729	773	82	965	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.8	0.0	22.4	40.5	41.3	40.8	37.6	16.1	12.1	48.2	35.3	29.1
Incr Delay (d2), s/veh	38.6	0.0	1.2	0.2	0.8	0.4	81.9	1.0	0.0	6.6	27.3	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	0.0	7.7	0.3	1.2	0.5	19.1	7.9	0.0	0.4	16.6	4.6
LnGrp Delay(d),s/veh	79.4	0.0	23.6	40.8	42.1	41.2	119.5	17.1	12.1	54.9	62.5	32.4
LnGrp LOS	F		C	D	D	D	F	B	B	D	E	C
Approach Vol, veh/h		918			81			1292			1161	
Approach Delay, s/veh		57.6			41.7			51.2			57.5	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	55.6		22.8	28.0	33.6		14.1
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	46.2		17.0	23.4	27.8		31.0
Max Q Clear Time (g_c+I1), s	2.7	18.4		19.0	25.4	29.5		4.4
Green Ext Time (p_c), s	0.0	19.9		0.0	0.0	0.0		0.3

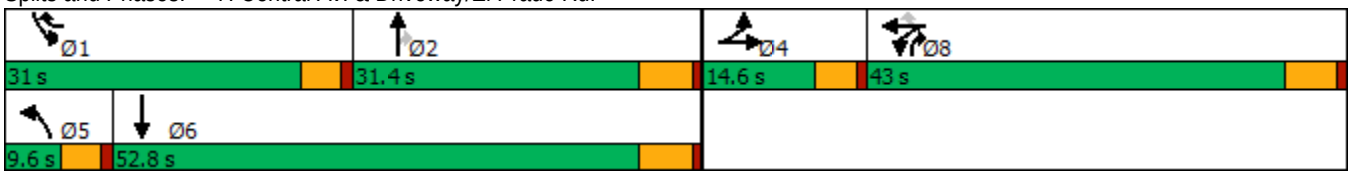
Intersection Summary	
HCM 2010 Ctrl Delay	54.8
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	27	5	838	4	557	9	595	873	613	738
Future Volume (vph)	27	5	838	4	557	9	595	873	613	738
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	43.0	43.0	31.0	9.6	31.4	43.0	31.0	52.8
Total Split (%)	12.2%	12.2%	35.8%	35.8%	25.8%	8.0%	26.2%	35.8%	25.8%	44.0%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.2	10.2	34.4	34.4	64.3	5.1	26.3	60.7	23.9	53.1
Actuated g/C Ratio	0.09	0.09	0.31	0.31	0.57	0.05	0.23	0.54	0.21	0.47
v/c Ratio	0.17	0.14	0.81	0.77	0.50	0.11	0.71	0.79	0.88	0.30
Control Delay	54.1	25.1	49.9	46.7	10.3	58.7	47.0	14.2	58.3	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	25.1	49.9	46.7	10.3	58.7	47.0	14.2	58.3	20.1
LOS	D	C	D	D	B	E	D	B	E	C
Approach Delay		39.8		33.2			27.7			37.2
Approach LOS		D		C			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.1	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 32.7	Intersection LOS: C
Intersection Capacity Utilization 97.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	5	21	838	4	557	9	595	873	613	738	18
Future Volume (veh/h)	27	5	21	838	4	557	9	595	873	613	738	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1768	1872	1872	1768	1872	1872	1768	1872	1872	1768	1872	1872
Adj Flow Rate, veh/h	28	5	13	876	0	429	9	620	733	639	769	15
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	116	32	82	996	0	811	18	871	835	700	2392	47
Arrive On Green	0.07	0.07	0.07	0.30	0.00	0.30	0.01	0.23	0.23	0.21	0.44	0.44
Sat Flow, veh/h	1684	461	1199	3368	0	1591	1684	3744	1569	3267	5488	107
Grp Volume(v), veh/h	28	0	18	876	0	429	9	620	733	639	524	260
Grp Sat Flow(s),veh/h/ln	1684	0	1660	1684	0	1591	1684	1872	1569	1633	1872	1850
Q Serve(g_s), s	1.7	0.0	1.1	27.3	0.0	19.9	0.6	16.8	25.6	21.0	10.1	10.1
Cycle Q Clear(g_c), s	1.7	0.0	1.1	27.3	0.0	19.9	0.6	16.8	25.6	21.0	10.1	10.1
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	116	0	114	996	0	811	18	871	835	700	1632	806
V/C Ratio(X)	0.24	0.00	0.16	0.88	0.00	0.53	0.49	0.71	0.88	0.91	0.32	0.32
Avail Cap(c_a), veh/h	153	0	151	1138	0	879	76	871	835	784	1632	806
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.5	0.0	48.3	36.9	0.0	18.1	54.1	38.8	18.3	42.2	20.4	20.4
Incr Delay (d2), s/veh	0.4	0.0	0.2	7.4	0.0	0.5	7.3	4.9	12.6	13.4	0.5	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	13.7	0.0	8.8	0.3	9.3	25.1	10.8	5.4	5.4
LnGrp Delay(d),s/veh	48.9	0.0	48.5	44.3	0.0	18.6	61.4	43.8	30.9	55.6	20.9	21.4
LnGrp LOS	D		D	D		B	E	D	C	E	C	C
Approach Vol, veh/h		46			1305			1362			1423	
Approach Delay, s/veh		48.8			35.9			36.9			36.6	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.2	31.4		12.1	5.8	53.8		38.3
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	26.4	25.6		10.0	5.0	47.0		37.2
Max Q Clear Time (g_c+I1), s	23.0	27.6		3.7	2.6	12.1		29.3
Green Ext Time (p_c), s	0.5	0.0		0.0	0.0	7.6		3.3

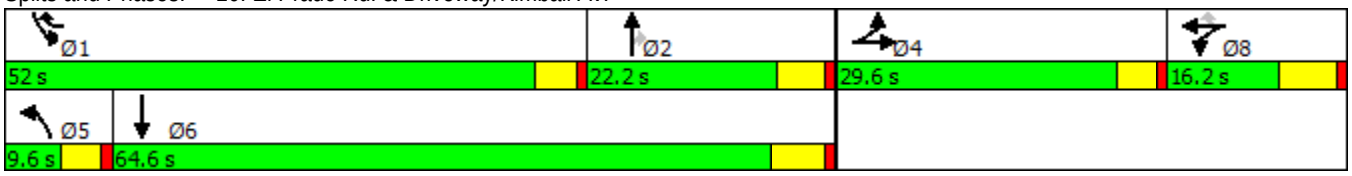
Intersection Summary	
HCM 2010 Ctrl Delay	36.6
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	37	9	3	1029	4	210	25	1061	366
Future Volume (vph)	37	9	3	1029	4	210	25	1061	366
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	52.0	9.6	22.2	22.2	52.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	43.3%	8.0%	18.5%	18.5%	43.3%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.9	12.9	10.5	58.1	5.2	16.0	16.0	49.8	59.9
Actuated g/C Ratio	0.14	0.14	0.11	0.62	0.06	0.17	0.17	0.53	0.64
v/c Ratio	0.18	0.08	0.15	0.93	0.04	0.72	0.07	0.68	0.35
Control Delay	42.7	29.4	48.4	24.6	53.2	55.8	0.3	24.2	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	29.4	48.4	24.6	53.2	55.8	0.3	24.2	13.5
LOS	D	C	D	C	D	E	A	C	B
Approach Delay		38.5	25.2			50.0			21.4
Approach LOS		D	C			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 25.6	Intersection LOS: C
Intersection Capacity Utilization 99.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	9	9	24	3	1029	4	210	25	1061	366	14
Future Volume (veh/h)	37	9	9	24	3	1029	4	210	25	1061	366	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	39	9	7	25	3	632	4	221	25	1117	385	14
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	139	80	63	181	22	773	95	288	245	1217	843	31
Arrive On Green	0.09	0.09	0.09	0.12	0.12	0.12	0.06	0.16	0.16	0.39	0.49	0.49
Sat Flow, veh/h	1619	940	731	1538	185	1530	1619	1800	1530	3141	1726	63
Grp Volume(v), veh/h	39	0	16	28	0	632	4	221	25	1117	0	399
Grp Sat Flow(s),veh/h/ln	1619	0	1671	1723	0	1530	1619	1800	1530	1570	0	1789
Q Serve(g_s), s	1.9	0.0	0.8	1.2	0.0	10.0	0.2	10.0	1.2	28.7	0.0	12.5
Cycle Q Clear(g_c), s	1.9	0.0	0.8	1.2	0.0	10.0	0.2	10.0	1.2	28.7	0.0	12.5
Prop In Lane	1.00		0.44	0.89		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	139	0	143	203	0	773	95	288	245	1217	0	874
V/C Ratio(X)	0.28	0.00	0.11	0.14	0.00	0.82	0.04	0.77	0.10	0.92	0.00	0.46
Avail Cap(c_a), veh/h	476	0	492	203	0	773	95	360	306	1752	0	1238
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	35.9	33.6	0.0	17.7	37.7	34.2	30.5	24.7	0.0	14.3
Incr Delay (d2), s/veh	1.1	0.0	0.3	0.3	0.0	6.9	0.1	7.6	0.2	4.9	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.4	0.6	0.0	13.8	0.1	5.6	0.5	13.2	0.0	6.2
LnGrp Delay(d),s/veh	37.5	0.0	36.2	33.9	0.0	24.6	37.8	41.8	30.7	29.6	0.0	14.7
LnGrp LOS	D		D	C		C	D	D	C	C		B
Approach Vol, veh/h		55			660			250			1516	
Approach Delay, s/veh		37.1			25.0			40.6			25.7	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	37.5	19.4		11.9	9.6	47.3		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	47.4	* 17		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	30.7	12.0		3.9	2.2	14.5		12.0
Green Ext Time (p_c), s	2.2	1.6		0.1	0.0	3.9		0.0

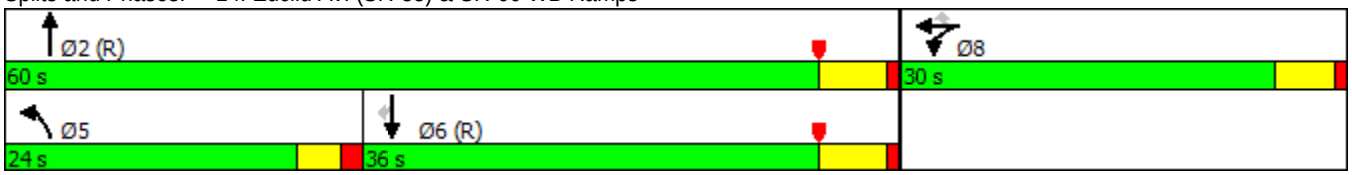
Intersection Summary	
HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	674	6	431	598	1109	968	560
Future Volume (vph)	674	6	431	598	1109	968	560
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	24.0	60.0	36.0	36.0
Total Split (%)	33.3%	33.3%	33.3%	26.7%	66.7%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	24.6	24.6	24.6	19.3	54.9	31.1	31.1
Actuated g/C Ratio	0.27	0.27	0.27	0.21	0.61	0.35	0.35
v/c Ratio	0.96	0.93	0.81	0.94	0.56	0.86	0.65
Control Delay	69.6	61.4	38.9	46.3	18.9	36.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	2.3	0.0	0.0
Total Delay	69.6	61.4	38.9	46.3	21.2	36.9	6.0
LOS	E	E	D	D	C	D	A
Approach Delay		57.1			30.0	25.6	
Approach LOS		E			C	C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 51 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 96.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	674	6	431	598	1109	0	0	968	560
Future Volume (veh/h)	0	0	0	674	6	431	598	1109	0	0	968	560
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1700	1800	1800	1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h				805	0	202	629	1167	0	0	1019	589
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				870	0	406	681	2102	0	0	1190	522
Arrive On Green				0.27	0.00	0.27	0.07	0.20	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3238	0	1510	3141	3510	0	0	3510	1500
Grp Volume(v), veh/h				805	0	202	629	1167	0	0	1019	589
Grp Sat Flow(s),veh/h/ln				1619	0	1510	1570	1710	0	0	1710	1500
Q Serve(g_s), s				21.8	0.0	10.2	17.9	27.6	0.0	0.0	24.9	31.3
Cycle Q Clear(g_c), s				21.8	0.0	10.2	17.9	27.6	0.0	0.0	24.9	31.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				870	0	406	681	2102	0	0	1190	522
V/C Ratio(X)				0.93	0.00	0.50	0.92	0.56	0.00	0.00	0.86	1.13
Avail Cap(c_a), veh/h				899	0	420	681	2102	0	0	1190	522
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.41	0.41	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.0	0.0	27.8	41.0	24.8	0.0	0.0	27.2	29.3
Incr Delay (d2), s/veh				14.5	0.0	0.4	9.0	0.4	0.0	0.0	8.0	79.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.5	0.0	4.2	8.7	13.2	0.0	0.0	13.1	24.5
LnGrp Delay(d),s/veh				46.5	0.0	28.1	50.0	25.2	0.0	0.0	35.2	109.0
LnGrp LOS				D		C	D	C			D	F
Approach Vol, veh/h					1007			1796			1608	
Approach Delay, s/veh					42.9			33.9			62.3	
Approach LOS					D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		60.8			24.0	36.8		29.2
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		54.5			19.5	30.5		25.0
Max Q Clear Time (g_c+I1), s		29.6			19.9	33.3		23.8
Green Ext Time (p_c), s		22.3			0.0	0.0		0.4

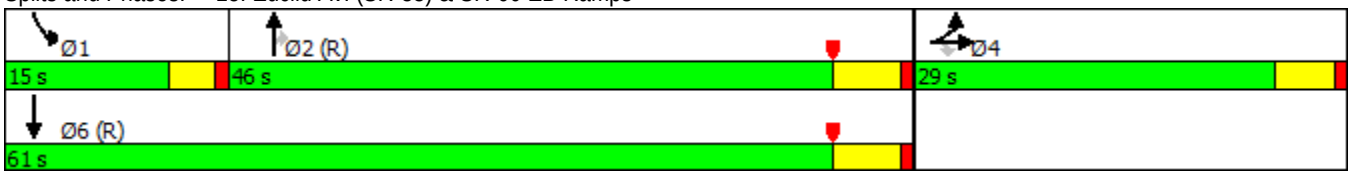
Intersection Summary	
HCM 2010 Ctrl Delay	46.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	400	2	577	1309	853	319	1324
Future Volume (vph)	400	2	577	1309	853	319	1324
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	29.0	46.0	46.0	15.0	61.0
Total Split (%)	32.2%	32.2%	32.2%	51.1%	51.1%	16.7%	67.8%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.6	22.6	22.6	41.9	41.9	11.0	56.9
Actuated g/C Ratio	0.25	0.25	0.25	0.47	0.47	0.12	0.63
v/c Ratio	0.90	0.82	0.76	0.84	0.79	0.85	0.62
Control Delay	60.4	44.0	36.2	27.7	9.6	51.1	2.4
Queue Delay	9.3	3.5	0.0	0.0	0.0	0.0	0.5
Total Delay	69.6	47.4	36.2	27.7	9.6	51.1	2.9
LOS	E	D	D	C	A	D	A
Approach Delay		51.5		20.6			12.3
Approach LOS		D		C			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 96.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	2	577	0	0	0	0	1309	853	319	1324	0
Future Volume (veh/h)	400	2	577	0	0	0	0	1309	853	319	1324	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800				0	1800	1800	1700	1800	0
Adj Flow Rate, veh/h	584	0	325				0	1336	870	326	1351	0
Adj No. of Lanes	2	0	1				0	2	1	2	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	767	0	362				0	1641	722	384	2211	0
Arrive On Green	0.24	0.00	0.24				0.00	0.48	0.48	0.04	0.21	0.00
Sat Flow, veh/h	3238	0	1530				0	3510	1505	3141	3510	0
Grp Volume(v), veh/h	584	0	325				0	1336	870	326	1351	0
Grp Sat Flow(s),veh/h/ln	1619	0	1530				0	1710	1505	1570	1710	0
Q Serve(g_s), s	15.1	0.0	18.5				0.0	30.0	43.2	9.3	32.2	0.0
Cycle Q Clear(g_c), s	15.1	0.0	18.5				0.0	30.0	43.2	9.3	32.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	767	0	362				0	1641	722	384	2211	0
V/C Ratio(X)	0.76	0.00	0.90				0.00	0.81	1.21	0.85	0.61	0.00
Avail Cap(c_a), veh/h	863	0	408				0	1641	722	384	2211	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.43	0.43	0.33	0.33	0.00
Uniform Delay (d), s/veh	32.0	0.0	33.3				0.0	20.0	23.4	42.4	25.2	0.0
Incr Delay (d2), s/veh	2.9	0.0	19.1				0.0	2.0	98.1	5.8	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.0	9.7				0.0	14.6	37.5	4.4	15.4	0.0
LnGrp Delay(d),s/veh	34.9	0.0	52.4				0.0	22.0	121.6	48.2	25.6	0.0
LnGrp LOS	C		D					C	F	D	C	
Approach Vol, veh/h		909						2206			1677	
Approach Delay, s/veh		41.2						61.3			30.0	
Approach LOS		D						E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.0	48.7		26.3		63.7		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	11.0	40.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	11.3	45.2		20.5		34.2		
Green Ext Time (p_c), s	0.0	0.0		0.8		20.8		

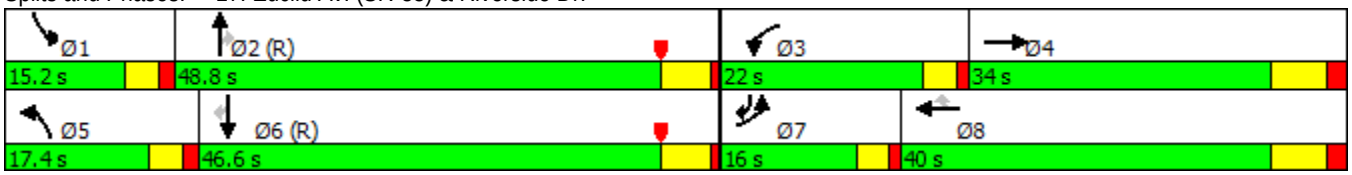
Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	155	399	184	358	57	115	1712	294	135	1260	172
Future Volume (vph)	155	399	184	358	57	115	1712	294	135	1260	172
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	16.0	34.0	22.0	40.0	40.0	17.4	48.8	48.8	15.2	46.6	16.0
Total Split (%)	13.3%	28.3%	18.3%	33.3%	33.3%	14.5%	40.7%	40.7%	12.7%	38.8%	13.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	12.0	24.2	16.9	29.0	29.0	12.5	44.8	44.8	13.2	45.5	59.0
Actuated g/C Ratio	0.10	0.20	0.14	0.24	0.24	0.10	0.37	0.37	0.11	0.38	0.49
v/c Ratio	1.04	0.77	0.88	0.47	0.14	0.74	1.00	0.44	0.82	0.73	0.22
Control Delay	133.7	51.3	85.2	40.1	2.3	52.0	61.9	18.0	70.2	28.4	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.7	51.3	85.2	40.1	2.3	52.0	61.9	18.0	70.2	28.4	10.6
LOS	F	D	F	D	A	D	E	B	E	C	B
Approach Delay		71.1		50.4			55.3			30.0	
Approach LOS		E		D			E			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 48.7	Intersection LOS: D
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	399	93	184	358	57	115	1712	294	135	1260	172
Future Volume (veh/h)	155	399	93	184	358	57	115	1712	294	135	1260	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	167	429	66	198	385	61	124	1841	185	145	1355	87
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	162	565	86	222	777	342	149	2008	625	144	1996	765
Arrive On Green	0.10	0.19	0.19	0.14	0.23	0.23	0.03	0.13	0.13	0.03	0.13	0.13
Sat Flow, veh/h	1619	2975	455	1619	3420	1507	1619	4914	1530	1619	4914	1507
Grp Volume(v), veh/h	167	245	250	198	385	61	124	1841	185	145	1355	87
Grp Sat Flow(s),veh/h/ln	1619	1710	1720	1619	1710	1507	1619	1638	1530	1619	1638	1507
Q Serve(g_s), s	12.0	16.3	16.5	14.4	11.8	3.9	9.1	44.4	13.1	10.7	31.5	5.1
Cycle Q Clear(g_c), s	12.0	16.3	16.5	14.4	11.8	3.9	9.1	44.4	13.1	10.7	31.5	5.1
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	325	327	222	777	342	149	2008	625	144	1996	765
V/C Ratio(X)	1.03	0.76	0.76	0.89	0.50	0.18	0.83	0.92	0.30	1.00	0.68	0.11
Avail Cap(c_a), veh/h	162	385	387	243	941	414	174	2008	625	144	1996	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.26	0.26	0.26	0.72	0.72	0.72
Uniform Delay (d), s/veh	54.0	46.0	46.0	50.9	40.4	37.3	57.3	49.9	36.3	58.2	44.5	23.2
Incr Delay (d2), s/veh	79.3	8.0	8.4	28.1	0.7	0.4	8.1	2.5	0.3	64.6	1.4	0.2
Initial Q Delay(d3),s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	8.4	8.6	8.2	5.6	1.7	4.4	20.6	5.6	7.4	14.6	2.2
LnGrp Delay(d),s/veh	133.6	53.9	54.4	79.0	41.1	37.7	65.3	52.3	36.7	122.8	45.9	23.4
LnGrp LOS	F	D	D	E	D	D	E	D	D	F	D	C
Approach Vol, veh/h		662			644			2150			1587	
Approach Delay, s/veh		74.2			52.4			51.7			51.7	
Approach LOS		E			D			D			D	

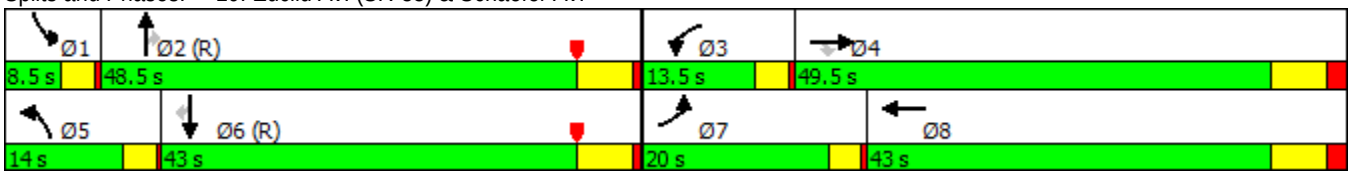
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.2	54.5	20.4	29.8	15.5	54.2	16.0	34.3
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	10.7	43.3	18.0	27.0	12.9	41.1	12.0	33.0
Max Q Clear Time (g_c+I1), s	12.7	46.4	16.4	18.5	11.1	33.5	14.0	13.8
Green Ext Time (p_c), s	0.0	0.0	0.0	4.3	0.0	7.2	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	54.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	312	234	195	29	51	131	2053	46	23	1401	137
Future Volume (vph)	312	234	195	29	51	131	2053	46	23	1401	137
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	20.0	49.5	49.5	13.5	43.0	14.0	48.5	48.5	8.5	43.0	43.0
Total Split (%)	16.7%	41.3%	41.3%	11.3%	35.8%	11.7%	40.4%	40.4%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	16.6	25.7	25.7	10.0	16.1	14.7	67.4	67.4	5.7	55.0	55.0
Actuated g/C Ratio	0.14	0.21	0.21	0.08	0.13	0.12	0.56	0.56	0.05	0.46	0.46
v/c Ratio	1.44	0.62	0.41	0.22	0.28	0.69	0.77	0.05	0.32	0.64	0.18
Control Delay	259.2	48.7	6.9	55.8	37.1	46.5	34.4	3.4	63.7	27.7	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	259.2	48.7	6.9	55.8	37.1	46.5	34.4	3.4	63.7	27.7	7.8
LOS	F	D	A	E	D	D	C	A	E	C	A
Approach Delay		126.4			42.8		34.5			26.5	
Approach LOS		F			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.44	
Intersection Signal Delay: 46.7	Intersection LOS: D
Intersection Capacity Utilization 87.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	312	234	195	29	51	15	131	2053	46	23	1401	137
Future Volume (veh/h)	312	234	195	29	51	15	131	2053	46	23	1401	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	322	241	125	30	53	10	135	2116	38	24	1444	88
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	287	244	85	110	21	142	2941	916	37	2623	799
Arrive On Green	0.14	0.16	0.16	0.05	0.07	0.07	0.06	0.40	0.40	0.01	0.18	0.18
Sat Flow, veh/h	1619	1800	1530	1619	1473	278	1619	4914	1530	1619	4914	1496
Grp Volume(v), veh/h	322	241	125	30	0	63	135	2116	38	24	1444	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	0	1751	1619	1638	1530	1619	1638	1496
Q Serve(g_s), s	16.5	15.6	9.0	2.1	0.0	4.1	10.0	43.5	1.8	1.8	32.2	5.9
Cycle Q Clear(g_c), s	16.5	15.6	9.0	2.1	0.0	4.1	10.0	43.5	1.8	1.8	32.2	5.9
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	287	244	85	0	130	142	2941	916	37	2623	799
V/C Ratio(X)	1.45	0.84	0.51	0.35	0.00	0.48	0.95	0.72	0.04	0.65	0.55	0.11
Avail Cap(c_a), veh/h	223	638	542	135	0	525	142	2941	916	67	2623	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.36	0.36	0.36	0.62	0.62	0.62
Uniform Delay (d), s/veh	51.8	49.0	46.2	54.9	0.0	53.3	56.2	27.5	15.0	59.1	36.3	25.5
Incr Delay (d2), s/veh	224.3	5.0	1.2	0.9	0.0	2.1	33.2	0.6	0.0	4.3	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.2	8.2	3.9	1.0	0.0	2.1	5.8	19.9	0.8	0.8	14.8	2.5
LnGrp Delay(d),s/veh	276.1	53.9	47.4	55.8	0.0	55.4	89.4	28.0	15.0	63.4	36.8	25.7
LnGrp LOS	F	D	D	E		E	F	C	B	E	D	C
Approach Vol, veh/h		688			93			2289			1556	
Approach Delay, s/veh		156.7			55.5			31.4			36.6	
Approach LOS		F			E			C			D	

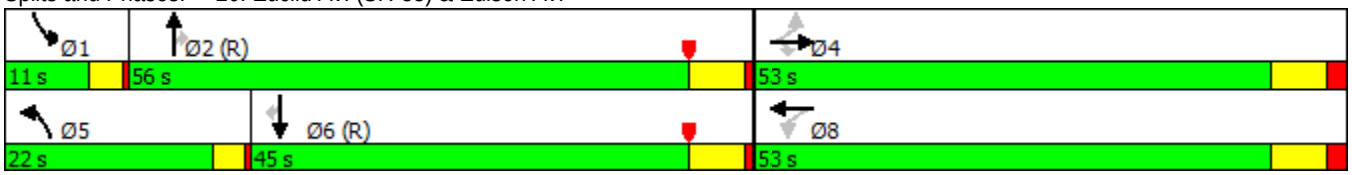
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	77.8	9.8	26.1	14.0	70.1	20.0	15.9
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	42.5	10.0	42.5	10.5	37.0	16.5	36.0
Max Q Clear Time (g_c+I1), s	3.8	45.5	4.1	17.6	12.0	34.2	18.5	6.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	2.8	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	52.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	357	490	296	30	145	199	1807	84	71	1372	176
Future Volume (vph)	357	490	296	30	145	199	1807	84	71	1372	176
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	53.0	53.0	53.0	53.0	53.0	22.0	56.0	56.0	11.0	45.0	45.0
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%	18.3%	46.7%	46.7%	9.2%	37.5%	37.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.0	44.0	44.0	44.0	44.0	17.3	52.1	52.1	7.3	42.2	42.2
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.14	0.43	0.43	0.06	0.35	0.35
v/c Ratio	0.94	0.76	0.41	0.21	0.28	0.88	0.86	0.12	0.73	0.81	0.29
Control Delay	69.7	41.4	4.5	29.4	25.8	59.8	34.5	12.2	113.2	18.8	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	41.4	4.5	29.4	25.8	59.8	34.5	12.2	113.2	18.8	2.8
LOS	E	D	A	C	C	E	C	B	F	B	A
Approach Delay		40.7			26.3		36.0			21.2	
Approach LOS		D			C		D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 31.9	Intersection LOS: C
Intersection Capacity Utilization 93.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	357	490	296	30	145	31	199	1807	84	71	1372	176
Future Volume (veh/h)	357	490	296	30	145	31	199	1807	84	71	1372	176
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	364	500	210	31	148	27	203	1844	66	72	1400	153
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	425	690	578	164	568	104	229	2086	649	89	1659	517
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.05	0.14	0.14	0.11	0.68	0.68
Sat Flow, veh/h	1161	1800	1508	709	1482	270	1619	4914	1530	1619	4914	1530
Grp Volume(v), veh/h	364	500	210	31	0	175	203	1844	66	72	1400	153
Grp Sat Flow(s),veh/h/ln	1161	1800	1508	709	0	1752	1619	1638	1530	1619	1638	1530
Q Serve(g_s), s	37.6	28.5	12.0	4.7	0.0	8.2	15.0	44.2	4.5	5.2	25.8	4.9
Cycle Q Clear(g_c), s	45.8	28.5	12.0	33.1	0.0	8.2	15.0	44.2	4.5	5.2	25.8	4.9
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	425	690	578	164	0	672	229	2086	649	89	1659	517
V/C Ratio(X)	0.86	0.72	0.36	0.19	0.00	0.26	0.89	0.88	0.10	0.81	0.84	0.30
Avail Cap(c_a), veh/h	425	690	578	164	0	672	250	2086	649	101	1659	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.46	0.46	0.46	0.76	0.76	0.76
Uniform Delay (d), s/veh	41.0	31.6	26.5	45.7	0.0	25.3	56.2	48.7	31.6	52.8	17.1	13.7
Incr Delay (d2), s/veh	15.6	3.8	0.4	0.6	0.0	0.2	14.3	2.9	0.1	24.5	4.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.9	14.9	5.0	0.9	0.0	4.0	7.6	20.7	1.9	2.9	11.8	2.2
LnGrp Delay(d),s/veh	56.7	35.4	26.9	46.3	0.0	25.6	70.6	51.6	31.8	77.3	21.3	14.8
LnGrp LOS	E	D	C	D		C	E	D	C	E	C	B
Approach Vol, veh/h		1074			206			2113			1625	
Approach Delay, s/veh		40.9			28.7			52.8			23.2	
Approach LOS		D			C			D			C	

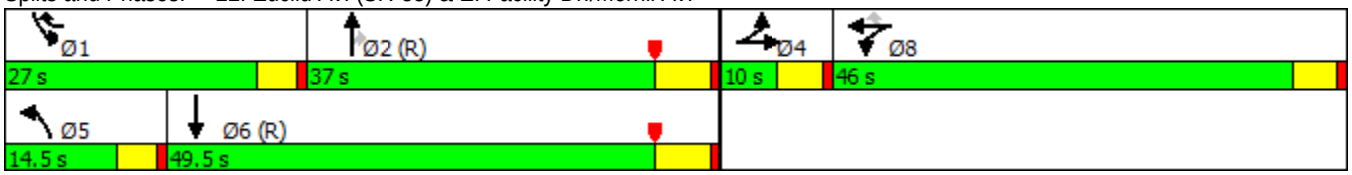
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.1	56.9		53.0	20.5	46.5		53.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	50.0		46.0	18.5	39.0		46.0
Max Q Clear Time (g_c+I1), s	7.2	46.2		47.8	17.0	27.8		35.1
Green Ext Time (p_c), s	0.0	3.7		0.0	0.0	10.5		4.8

Intersection Summary	
HCM 2010 Ctrl Delay	39.7
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	22	0	460	2	1737	356	698	1182
Future Volume (vph)	22	0	460	2	1737	356	698	1182
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	27.0	14.5	37.0	37.0	27.0	49.5
Total Split (%)	8.3%	38.3%	22.5%	12.1%	30.8%	30.8%	22.5%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	22.3	65.5	10.0	36.0	36.0	38.2	75.8
Actuated g/C Ratio	0.04	0.19	0.55	0.08	0.30	0.30	0.32	0.63
v/c Ratio	0.49	0.63	0.55	0.01	1.22	0.69	0.73	0.41
Control Delay	63.3	52.4	15.5	64.0	138.8	22.3	37.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	52.4	15.5	64.0	138.8	22.3	37.0	5.1
LOS	E	D	B	E	F	C	D	A
Approach Delay	63.3	26.1			118.9			17.0
Approach LOS	E	C			F			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 88.5 (74%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 64.4	Intersection LOS: E
Intersection Capacity Utilization 88.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	11	185	0	460	2	1737	356	698	1182	1
Future Volume (veh/h)	5	22	11	185	0	460	2	1737	356	698	1182	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1872	1800	1768	1800	1800
Adj Flow Rate, veh/h	5	24	4	199	0	387	2	1868	354	751	1271	1
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	7	35	6	386	0	631	9	1986	587	612	2895	2
Arrive On Green	0.03	0.03	0.03	0.23	0.00	0.23	0.01	0.39	0.39	0.19	0.57	0.57
Sat Flow, veh/h	265	1272	212	1714	0	1530	1619	5111	1510	3267	5071	4
Grp Volume(v), veh/h	33	0	0	199	0	387	2	1868	354	751	821	451
Grp Sat Flow(s),veh/h/ln	1749	0	0	1714	0	1530	1619	1704	1510	1633	1638	1799
Q Serve(g_s), s	2.2	0.0	0.0	12.2	0.0	23.9	0.1	42.3	22.5	22.5	17.2	17.2
Cycle Q Clear(g_c), s	2.2	0.0	0.0	12.2	0.0	23.9	0.1	42.3	22.5	22.5	17.2	17.2
Prop In Lane	0.15		0.12	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	49	0	0	386	0	631	9	1986	587	612	1870	1027
V/C Ratio(X)	0.68	0.00	0.00	0.52	0.00	0.61	0.23	0.94	0.60	1.23	0.44	0.44
Avail Cap(c_a), veh/h	73	0	0	586	0	810	135	1986	587	612	1870	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.49	0.49	0.49	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.8	0.0	0.0	40.7	0.0	27.7	59.4	35.3	29.3	48.8	14.7	14.7
Incr Delay (d2), s/veh	6.0	0.0	0.0	0.4	0.0	0.4	2.4	5.8	2.3	115.8	0.8	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	5.8	0.0	10.1	0.1	21.0	9.7	20.0	7.9	8.9
LnGrp Delay(d),s/veh	63.8	0.0	0.0	41.1	0.0	28.1	61.9	41.1	31.6	164.5	15.5	16.1
LnGrp LOS	E			D		C	E	D	C	F	B	B
Approach Vol, veh/h		33			586			2224			2023	
Approach Delay, s/veh		63.8			32.5			39.6			71.0	
Approach LOS		E			C			D			E	

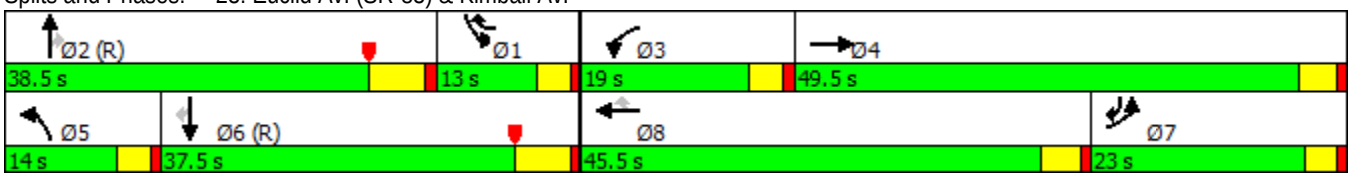
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	27.0	52.6		8.3	5.1	74.5		32.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	22.5	31.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	24.5	44.3		4.2	2.1	19.2		25.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	21.3		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	52.0
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	638	862	245	516	562	126	842	165	329	899	204
Future Volume (vph)	638	862	245	516	562	126	842	165	329	899	204
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8	1	5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.0	49.5	14.0	45.5	9.0	14.0	36.0	36.0	9.0	33.0	14.0
Total Split (s)	23.0	49.5	19.0	45.5	13.0	14.0	38.5	38.5	13.0	37.5	23.0
Total Split (%)	19.2%	41.3%	15.8%	37.9%	10.8%	11.7%	32.1%	32.1%	10.8%	31.3%	19.2%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	34.0	45.0	15.0	25.9	43.6	10.0	28.4	28.4	13.1	31.5	67.5
Actuated g/C Ratio	0.28	0.38	0.12	0.22	0.36	0.08	0.24	0.24	0.11	0.26	0.56
v/c Ratio	0.75	0.77	1.27	0.73	0.94	0.97	0.75	0.35	1.00	0.73	0.23
Control Delay	46.3	37.8	196.8	49.0	54.5	117.2	23.4	2.6	91.7	31.9	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	37.8	196.8	49.0	54.5	117.2	23.4	2.6	91.7	31.9	7.3
LOS	D	D	F	D	D	F	C	A	F	C	A
Approach Delay		41.2		78.7			30.8			42.2	
Approach LOS		D		E			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 48.4	Intersection LOS: D
Intersection Capacity Utilization 86.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	638	862	83	245	516	562	126	842	165	329	899	204
Future Volume (veh/h)	638	862	83	245	516	562	126	842	165	329	899	204
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	665	898	82	255	538	551	131	877	157	343	936	194
Adj No. of Lanes	2	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	709	995	91	202	715	591	135	1046	326	557	1589	834
Arrive On Green	0.23	0.31	0.31	0.13	0.21	0.21	0.17	0.43	0.43	0.18	0.32	0.32
Sat Flow, veh/h	3141	3170	289	1619	3420	1530	1619	4914	1530	3141	4914	1511
Grp Volume(v), veh/h	665	484	496	255	538	551	131	877	157	343	936	194
Grp Sat Flow(s),veh/h/ln	1570	1710	1749	1619	1710	1530	1619	1638	1530	1570	1638	1511
Q Serve(g_s), s	25.0	32.5	32.5	15.0	17.7	20.2	9.7	19.1	6.5	12.1	19.1	2.1
Cycle Q Clear(g_c), s	25.0	32.5	32.5	15.0	17.7	20.2	9.7	19.1	6.5	12.1	19.1	2.1
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	709	537	549	202	715	591	135	1046	326	557	1589	834
V/C Ratio(X)	0.94	0.90	0.90	1.26	0.75	0.93	0.97	0.84	0.48	0.62	0.59	0.23
Avail Cap(c_a), veh/h	709	641	656	202	1169	794	135	1331	414	557	1589	834
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.31	0.31	0.31	1.00	1.00	1.00	0.60	0.60	0.60	0.90	0.90	0.90
Uniform Delay (d), s/veh	45.6	39.4	39.4	52.5	44.5	35.3	49.9	32.6	16.1	45.6	33.9	5.1
Incr Delay (d2), s/veh	8.1	5.2	5.1	150.5	0.6	12.8	51.2	5.0	3.0	1.4	1.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	16.1	16.5	15.2	8.4	10.5	6.2	9.1	3.0	5.3	8.9	1.9
LnGrp Delay(d),s/veh	53.7	44.6	44.5	203.0	45.2	48.1	101.1	37.6	19.1	46.9	35.4	5.7
LnGrp LOS	D	D	D	F	D	D	F	D	B	D	D	A
Approach Vol, veh/h		1645			1344			1165			1473	
Approach Delay, s/veh		48.3			76.3			42.3			34.2	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.3	31.5	19.0	42.2	14.0	44.8	31.6	29.6
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.5	* 4.5
Max Green Setting (Gmax), s	9.0	* 33	15.0	45.0	10.0	31.5	19.0	* 41
Max Q Clear Time (g_c+I1), s	14.1	21.1	17.0	34.5	11.7	21.1	27.0	22.2
Green Ext Time (p_c), s	0.0	4.4	0.0	3.1	0.0	5.0	0.0	2.9

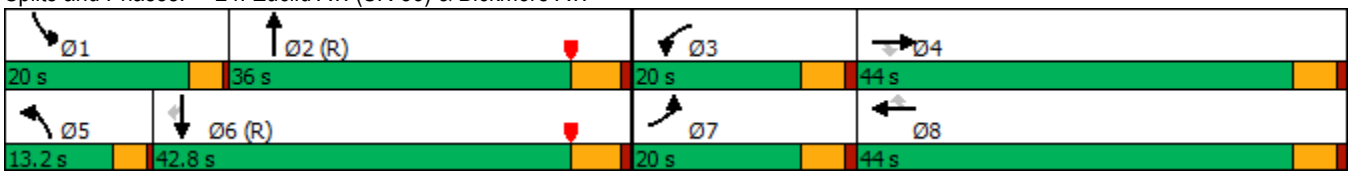
Intersection Summary	
HCM 2010 Ctrl Delay	50.0
HCM 2010 LOS	D

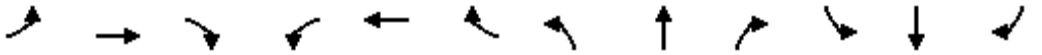
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	117	122	120	223	43	130	48	890	222	887	79
Future Volume (vph)	117	122	120	223	43	130	48	890	222	887	79
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4			8					6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	28.0	28.0	10.0	28.0	28.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	20.0	44.0	44.0	20.0	44.0	44.0	13.2	36.0	20.0	42.8	42.8
Total Split (%)	16.7%	36.7%	36.7%	16.7%	36.7%	36.7%	11.0%	30.0%	16.7%	35.7%	35.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.8	14.3	14.3	15.0	16.5	16.5	8.4	43.2	28.5	65.0	65.0
Actuated g/C Ratio	0.11	0.12	0.12	0.12	0.14	0.14	0.07	0.36	0.24	0.54	0.54
v/c Ratio	0.76	0.64	0.44	1.23	0.19	0.43	0.47	0.72	0.64	0.37	0.10
Control Delay	78.2	62.6	12.1	184.4	46.7	11.1	90.3	18.4	30.1	18.6	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.2	62.6	12.1	184.4	46.7	11.1	90.3	18.4	30.1	18.6	10.3
LOS	E	E	B	F	D	B	F	B	C	B	B
Approach Delay		50.8			112.7			21.3		20.2	
Approach LOS		D			F			C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 35.8	Intersection LOS: D
Intersection Capacity Utilization 74.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	122	120	223	43	130	48	890	245	222	887	79
Future Volume (veh/h)	117	122	120	223	43	130	48	890	245	222	887	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	130	136	114	248	48	132	53	989	262	247	986	88
Adj No. of Lanes	1	1	1	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	155	172	146	202	224	191	66	1863	493	223	2851	869
Arrive On Green	0.10	0.10	0.10	0.13	0.12	0.12	0.01	0.16	0.16	0.28	1.00	1.00
Sat Flow, veh/h	1619	1800	1530	1619	1800	1530	1619	3852	1019	1619	4914	1498
Grp Volume(v), veh/h	130	136	114	248	48	132	53	841	410	247	986	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1800	1530	1619	1638	1595	1619	1638	1498
Q Serve(g_s), s	9.5	8.9	8.7	15.0	2.9	9.9	3.9	28.3	28.3	16.5	0.0	0.0
Cycle Q Clear(g_c), s	9.5	8.9	8.7	15.0	2.9	9.9	3.9	28.3	28.3	16.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.64	1.00		1.00
Lane Grp Cap(c), veh/h	155	172	146	202	224	191	66	1584	771	223	2851	869
V/C Ratio(X)	0.84	0.79	0.78	1.23	0.21	0.69	0.80	0.53	0.53	1.11	0.35	0.10
Avail Cap(c_a), veh/h	202	585	497	202	585	497	131	1584	771	223	2851	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.43	0.43	0.43
Uniform Delay (d), s/veh	53.3	53.1	53.0	52.5	47.2	50.3	58.7	37.9	38.0	43.5	0.0	0.0
Incr Delay (d2), s/veh	16.6	3.1	3.4	137.2	0.2	1.7	0.8	0.1	0.2	72.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	4.6	3.8	14.4	1.4	4.3	1.8	12.9	12.6	11.8	0.0	0.0
LnGrp Delay(d),s/veh	69.9	56.2	56.4	189.7	47.4	52.0	59.5	38.0	38.2	116.4	0.1	0.1
LnGrp LOS	E	E	E	F	D	D	E	D	D	F	A	A
Approach Vol, veh/h		380			428			1304			1321	
Approach Delay, s/veh		60.9			131.3			39.0			21.9	
Approach LOS		E			F			D			C	

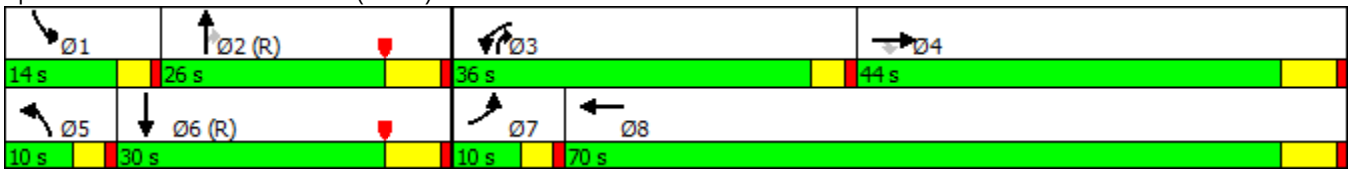
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	63.5	20.0	16.5	8.4	75.1	16.5	19.9
Change Period (Y+Rc), s	3.5	5.5	5.0	5.0	3.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	16.5	30.5	15.0	39.0	9.7	37.3	15.0	39.0
Max Q Clear Time (g_c+I1), s	18.5	30.3	17.0	10.9	5.9	2.0	11.5	11.9
Green Ext Time (p_c), s	0.0	0.1	0.0	0.6	0.0	4.3	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	46.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	353	30	494	80	35	1043	1117	144	1032
Future Volume (vph)	15	353	30	494	80	35	1043	1117	144	1032
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	10.0	44.0	44.0	36.0	70.0	10.0	26.0	36.0	14.0	30.0
Total Split (%)	8.3%	36.7%	36.7%	30.0%	58.3%	8.3%	21.7%	30.0%	11.7%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.5	30.3	30.3	32.0	62.3	6.4	21.9	59.9	15.8	35.0
Actuated g/C Ratio	0.05	0.25	0.25	0.27	0.52	0.05	0.18	0.50	0.13	0.29
v/c Ratio	0.20	0.80	0.06	0.65	0.17	0.42	1.20	1.32	0.69	0.75
Control Delay	61.5	55.2	0.3	43.5	9.7	67.9	130.9	163.5	67.3	45.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	55.2	0.3	43.5	9.7	67.9	130.9	163.5	67.3	45.1
LOS	E	E	A	D	A	E	F	F	E	D
Approach Delay		51.2			35.6		146.5			47.8
Approach LOS		D			D		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.32	
Intersection Signal Delay: 95.3	Intersection LOS: F
Intersection Capacity Utilization 113.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	353	30	494	80	71	35	1043	1117	144	1032	15
Future Volume (veh/h)	15	353	30	494	80	71	35	1043	1117	144	1032	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	15	364	0	509	82	67	36	1075	719	148	1064	11
Adj No. of Lanes	1	1	1	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	27	425	362	565	377	308	47	1585	786	135	1889	20
Arrive On Green	0.02	0.24	0.00	0.19	0.41	0.41	0.03	0.32	0.32	0.03	0.12	0.12
Sat Flow, veh/h	1619	1800	1530	2956	918	750	1619	4914	1530	1619	5014	52
Grp Volume(v), veh/h	15	364	0	509	0	149	36	1075	719	148	695	380
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	0	1668	1619	1638	1530	1619	1638	1789
Q Serve(g_s), s	1.1	23.2	0.0	20.2	0.0	6.9	2.6	22.8	38.7	10.0	24.0	24.0
Cycle Q Clear(g_c), s	1.1	23.2	0.0	20.2	0.0	6.9	2.6	22.8	38.7	10.0	24.0	24.0
Prop In Lane	1.00		1.00	1.00		0.45	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	27	425	362	565	0	686	47	1585	786	135	1234	674
V/C Ratio(X)	0.57	0.86	0.00	0.90	0.00	0.22	0.76	0.68	0.91	1.10	0.56	0.56
Avail Cap(c_a), veh/h	81	570	484	788	0	889	81	1585	786	135	1234	674
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.84	0.84	0.84
Uniform Delay (d), s/veh	58.6	43.9	0.0	47.4	0.0	22.8	57.8	35.3	26.8	58.4	43.2	43.3
Incr Delay (d2), s/veh	6.8	10.7	0.0	8.5	0.0	0.2	0.9	0.2	2.1	99.4	1.6	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.8	0.0	8.9	0.0	3.2	1.2	10.3	22.1	8.2	11.2	12.4
LnGrp Delay(d),s/veh	65.4	54.6	0.0	55.9	0.0	23.1	58.7	35.5	28.9	157.8	44.8	46.1
LnGrp LOS	E	D		E		C	E	D	C	F	D	D
Approach Vol, veh/h		379			658			1830			1223	
Approach Delay, s/veh		55.0			48.5			33.3			58.9	
Approach LOS		E			D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	44.7	26.9	34.4	7.5	51.2	6.0	55.3
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	20.0	32.0	38.0	6.0	24.0	6.0	64.0
Max Q Clear Time (g_c+I1), s	12.0	40.7	22.2	25.2	4.6	26.0	3.1	8.9
Green Ext Time (p_c), s	0.0	0.0	0.7	3.1	0.0	0.0	0.0	4.7

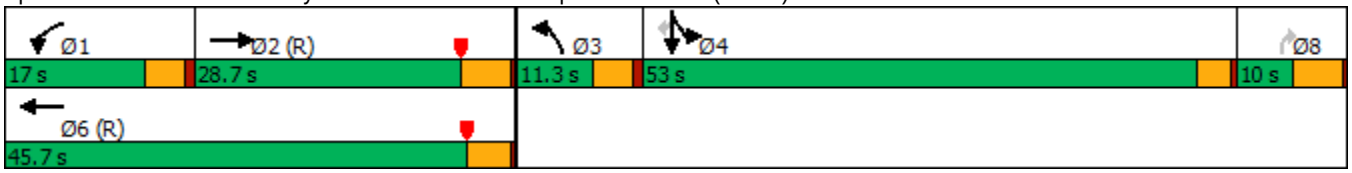
Intersection Summary	
HCM 2010 Ctrl Delay	45.4
HCM 2010 LOS	D

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	331	105	253	31	16	770	149	162
Future Volume (vph)	331	105	253	31	16	770	149	162
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	28.7	17.0	45.7	11.3	10.0	53.0	53.0	53.0
Total Split (%)	23.9%	14.2%	38.1%	9.4%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	38.5	12.5	56.0	6.5	5.0	39.2	39.2	39.2
Actuated g/C Ratio	0.32	0.10	0.47	0.05	0.04	0.33	0.33	0.33
v/c Ratio	0.36	0.64	0.16	0.37	0.08	0.78	0.26	0.27
Control Delay	35.0	78.0	12.8	66.7	0.9	41.6	29.5	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	78.0	12.8	66.7	0.9	41.6	29.5	4.7
LOS	C	E	B	E	A	D	C	A
Approach Delay	35.0		31.9				34.4	
Approach LOS	C		C				C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 34.3 — Intersection LOS: C
Intersection Capacity Utilization 53.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	331	45	105	253	0	31	0	16	770	149	162
Future Volume (veh/h)	0	331	45	105	253	0	31	0	16	770	149	162
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	1700	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	341	46	108	261	0	32	0	16	794	154	167
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1574	211	131	2180	0	0	0	0	916	525	446
Arrive On Green	0.00	0.52	0.52	0.05	0.43	0.00	0.00	0.00	0.00	0.29	0.29	0.29
Sat Flow, veh/h	0	3123	406	1619	3510	0		0		3141	1800	1530
Grp Volume(v), veh/h	0	191	196	108	261	0		0.0		794	154	167
Grp Sat Flow(s),veh/h/ln	0	1710	1728	1619	1710	0				1570	1800	1530
Q Serve(g_s), s	0.0	7.3	7.4	7.9	5.5	0.0				28.8	8.0	10.4
Cycle Q Clear(g_c), s	0.0	7.3	7.4	7.9	5.5	0.0				28.8	8.0	10.4
Prop In Lane	0.00		0.23	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	888	897	131	2180	0				916	525	446
V/C Ratio(X)	0.00	0.22	0.22	0.82	0.12	0.00				0.87	0.29	0.37
Avail Cap(c_a), veh/h	0	888	897	169	2180	0				1296	743	631
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	15.6	15.7	55.9	14.0	0.0				40.3	32.9	33.8
Incr Delay (d2), s/veh	0.0	0.6	0.6	22.1	0.1	0.0				4.6	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.5	3.7	4.4	2.7	0.0				13.1	4.0	4.5
LnGrp Delay(d),s/veh	0.0	16.2	16.2	78.0	14.2	0.0				44.9	33.2	34.3
LnGrp LOS		B	B	E	B					D	C	C
Approach Vol, veh/h		387			369						1115	
Approach Delay, s/veh		16.2			32.8						41.7	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.2	67.3		38.5		81.5		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	12.5	23.7		49.5		* 41		
Max Q Clear Time (g_c+I1), s	9.9	9.4		30.8		7.5		
Green Ext Time (p_c), s	0.1	1.1		4.3		1.3		

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Notes

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1303	57	4	1180	204	15
Future Volume (vph)	1303	57	4	1180	204	15
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	58.3	58.3	9.6	67.9	32.1	32.1
Total Split (%)	58.3%	58.3%	9.6%	67.9%	32.1%	32.1%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	35.8	35.8	5.4	37.1	16.4	16.4
Actuated g/C Ratio	0.54	0.54	0.08	0.56	0.25	0.25
v/c Ratio	0.76	0.07	0.03	0.67	0.55	0.04
Control Delay	15.8	3.2	39.2	11.9	30.1	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	3.2	39.2	11.9	30.1	12.4
LOS	B	A	D	B	C	B
Approach Delay	15.2			12.0	28.9	
Approach LOS	B			B	C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 65.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 60.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1303	57	4	1180	204	15
Future Volume (veh/h)	1303	57	4	1180	204	15
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1416	62	4	1283	222	16
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2093	936	9	2324	271	256
Arrive On Green	0.61	0.61	0.01	0.68	0.17	0.17
Sat Flow, veh/h	3510	1530	1619	3510	1619	1530
Grp Volume(v), veh/h	1416	62	4	1283	222	16
Grp Sat Flow(s),veh/h/ln	1710	1530	1619	1710	1619	1530
Q Serve(g_s), s	20.2	1.2	0.2	14.2	9.8	0.6
Cycle Q Clear(g_c), s	20.2	1.2	0.2	14.2	9.8	0.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2093	936	9	2324	271	256
V/C Ratio(X)	0.68	0.07	0.46	0.55	0.82	0.06
Avail Cap(c_a), veh/h	2415	1080	110	2860	593	560
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.5	5.8	36.6	6.1	29.6	25.9
Incr Delay (d2), s/veh	0.6	0.0	13.7	0.2	6.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	0.5	0.1	6.7	4.8	0.3
LnGrp Delay(d),s/veh	10.1	5.8	50.2	6.3	35.7	26.0
LnGrp LOS	B	A	D	A	D	C
Approach Vol, veh/h	1478			1287	238	
Approach Delay, s/veh	9.9			6.4	35.1	
Approach LOS	A			A	D	

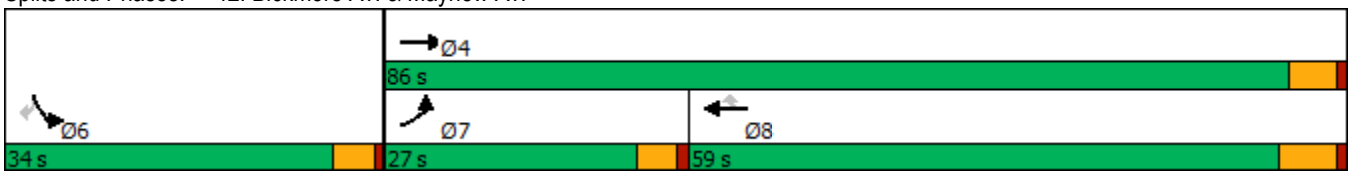
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.0	51.3				56.3		17.4
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	52.1				61.7		27.0
Max Q Clear Time (g_c+I1), s	2.2	22.2				16.2		11.8
Green Ext Time (p_c), s	0.0	22.9				31.1		0.6

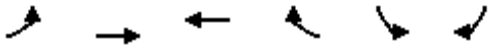
Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	42	410	212	6	30	99
Future Volume (vph)	42	410	212	6	30	99
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phase	7	4	8	8	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	15.4	23.2	23.2	31.7	31.7
Total Split (s)	27.0	86.0	59.0	59.0	34.0	34.0
Total Split (%)	22.5%	71.7%	49.2%	49.2%	28.3%	28.3%
Yellow Time (s)	3.6	4.4	5.2	5.2	3.7	3.7
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	6.2	6.2	4.7	4.7
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	6.3	14.2	11.8	11.8	13.0	13.0
Actuated g/C Ratio	0.16	0.37	0.31	0.31	0.34	0.34
v/c Ratio	0.17	0.35	0.22	0.01	0.06	0.18
Control Delay	19.6	9.7	12.7	9.8	10.2	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	9.7	12.7	9.8	10.2	3.8
LOS	B	A	B	A	B	A
Approach Delay		10.7	12.6		5.3	
Approach LOS		B	B		A	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 38.3		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.35		
Intersection Signal Delay: 10.3	Intersection LOS: B	
Intersection Capacity Utilization 33.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 42: Bickmore Av. & Mayhew Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	410	212	6	30	99
Future Volume (veh/h)	42	410	212	6	30	99
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1700	1800
Adj Flow Rate, veh/h	46	446	230	7	33	108
Adj No. of Lanes	1	2	2	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	82	1508	914	409	433	409
Arrive On Green	0.05	0.44	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1619	3510	3510	1530	1619	1530
Grp Volume(v), veh/h	46	446	230	7	33	108
Grp Sat Flow(s),veh/h/ln	1619	1710	1710	1530	1619	1530
Q Serve(g_s), s	1.0	3.1	2.0	0.1	0.6	2.1
Cycle Q Clear(g_c), s	1.0	3.1	2.0	0.1	0.6	2.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	82	1508	914	409	433	409
V/C Ratio(X)	0.56	0.30	0.25	0.02	0.08	0.26
Avail Cap(c_a), veh/h	970	7372	4829	2161	1269	1199
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	6.7	10.8	10.1	10.2	10.8
Incr Delay (d2), s/veh	2.2	0.1	0.1	0.0	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.4	0.9	0.1	0.3	0.9
LnGrp Delay(d),s/veh	19.5	6.8	10.9	10.1	10.3	11.1
LnGrp LOS	B	A	B	B	B	B
Approach Vol, veh/h		492	237		141	
Approach Delay, s/veh		8.0	10.9		10.9	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				22.7		14.7	6.5	16.2
Change Period (Y+Rc), s				* 6.2		4.7	4.6	6.2
Max Green Setting (Gmax), s				* 81		29.3	22.4	52.8
Max Q Clear Time (g_c+I1), s				5.1		4.1	3.0	4.0
Green Ext Time (p_c), s				3.1		0.4	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

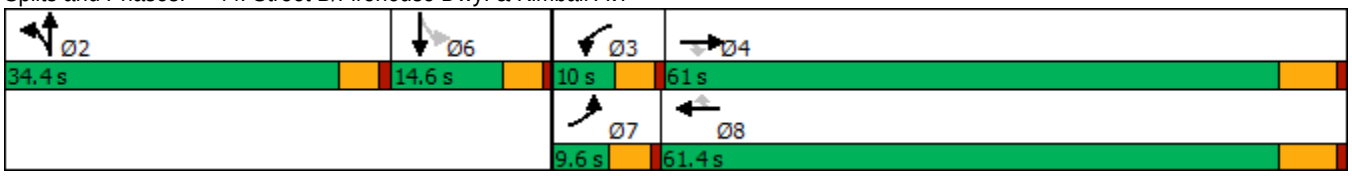
Notes

Lane Group	EBT	EBR	WBL	WBT	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	1265	71	21	893	0		
Future Volume (vph)	1265	71	21	893	0		
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		3	8	2	6	7
Permitted Phases		4					
Detector Phase	4	4	3	8	2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	23.2	23.2	9.6	16.2	31.6	14.6	9.6
Total Split (s)	61.0	61.0	10.0	61.4	34.4	14.6	9.6
Total Split (%)	50.8%	50.8%	8.3%	51.2%	28.7%	12%	8%
Yellow Time (s)	5.2	5.2	3.6	5.2	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.2	6.2	4.6	6.2	4.6		
Lead/Lag	Lag	Lag	Lead	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	Min	Min	None
Act Effct Green (s)	42.1	42.1	5.6	45.2	18.6		
Actuated g/C Ratio	0.46	0.46	0.06	0.50	0.20		
v/c Ratio	0.80	0.08	0.21	0.55	0.73		
Control Delay	26.0	2.3	55.7	16.9	33.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	26.0	2.3	55.7	16.9	33.9		
LOS	C	A	E	B	C		
Approach Delay	24.8			17.8	33.9		
Approach LOS	C			B	C		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 91
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 23.4 — Intersection LOS: C
Intersection Capacity Utilization 64.7% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1265	71	21	893	0	290	0	28	0	0	0
Future Volume (veh/h)	0	1265	71	21	893	0	290	0	28	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	1332	75	22	940	0	305	0	29	0	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	2	1791	761	41	2026	906	378	0	36	0	3	0
Arrive On Green	0.00	0.50	0.50	0.03	0.59	0.00	0.24	0.00	0.24	0.00	0.00	0.00
Sat Flow, veh/h	1619	3600	1530	1619	3420	1530	1549	0	147	0	1800	0
Grp Volume(v), veh/h	0	1332	75	22	940	0	334	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1619	1710	1530	1697	0	0	0	1800	0
Q Serve(g_s), s	0.0	19.5	1.7	0.9	10.2	0.0	12.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	19.5	1.7	0.9	10.2	0.0	12.2	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.91		0.09	0.00		0.00
Lane Grp Cap(c), veh/h	2	1791	761	41	2026	906	414	0	0	0	3	0
V/C Ratio(X)	0.00	0.74	0.10	0.54	0.46	0.00	0.81	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	123	2986	1269	132	2857	1278	765	0	0	0	272	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	13.2	8.8	31.8	7.6	0.0	23.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.1	4.1	0.2	0.0	3.7	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.8	0.7	0.4	4.7	0.0	6.2	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.9	8.8	35.9	7.7	0.0	27.2	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		B	A	D	A		C					
Approach Vol, veh/h		1407			962			334			0	
Approach Delay, s/veh		13.6			8.4			27.2			0.0	
Approach LOS		B			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		20.7	6.3	39.1		0.0	0.0	45.3
Change Period (Y+Rc), s		4.6	4.6	6.2		4.6	4.6	6.2
Max Green Setting (Gmax), s		29.8	5.4	54.8		10.0	5.0	55.2
Max Q Clear Time (g_c+I1), s		14.2	2.9	21.5		0.0	0.0	12.2
Green Ext Time (p_c), s		1.9	0.0	11.4		0.0	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	306	713	14	425	26	6	76	18
Future Volume (vph)	306	713	14	425	26	6	76	18
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	37.4	9.6	24.0	33.0	33.0	33.0	33.0
Total Split (%)	28.8%	46.8%	12.0%	30.0%	41.3%	41.3%	41.3%	41.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	17.3	36.4	5.1	16.2		26.9		26.9
Actuated g/C Ratio	0.23	0.48	0.07	0.21		0.35		0.35
v/c Ratio	0.89	0.50	0.14	0.77		0.10		0.92
Control Delay	56.7	15.8	38.6	36.9		18.1		49.9
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	56.7	15.8	38.6	36.9		18.1		49.9
LOS	E	B	D	D		B		D
Approach Delay		27.5		37.0		18.1		49.9
Approach LOS		C		D		B		D

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 76
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 34.6 — Intersection LOS: C
Intersection Capacity Utilization 75.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	713	47	14	425	89	26	6	10	76	18	359
Future Volume (veh/h)	306	713	47	14	425	89	26	6	10	76	18	359
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	326	759	50	15	452	95	28	6	11	81	19	382
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	363	1377	91	29	613	128	225	53	64	125	42	417
Arrive On Green	0.22	0.42	0.42	0.02	0.22	0.22	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1619	3251	214	1619	2818	588	418	151	184	194	119	1194
Grp Volume(v), veh/h	326	399	410	15	273	274	45	0	0	482	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1755	1619	1710	1696	753	0	0	1507	0	0
Q Serve(g_s), s	14.4	12.9	12.9	0.7	11.0	11.1	0.0	0.0	0.0	16.6	0.0	0.0
Cycle Q Clear(g_c), s	14.4	12.9	12.9	0.7	11.0	11.1	1.4	0.0	0.0	22.5	0.0	0.0
Prop In Lane	1.00		0.12	1.00		0.35	0.62		0.24	0.17		0.79
Lane Grp Cap(c), veh/h	363	725	744	29	372	369	342	0	0	583	0	0
V/C Ratio(X)	0.90	0.55	0.55	0.52	0.73	0.74	0.13	0.00	0.00	0.83	0.00	0.00
Avail Cap(c_a), veh/h	405	725	744	110	413	410	385	0	0	638	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	27.8	16.0	16.0	35.8	26.8	26.9	16.0	0.0	0.0	22.8	0.0	0.0
Incr Delay (d2), s/veh	19.8	0.9	0.9	5.2	5.9	6.4	0.2	0.0	0.0	8.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	6.3	6.4	0.3	5.8	5.8	0.6	0.0	0.0	10.7	0.0	0.0
LnGrp Delay(d),s/veh	47.5	16.8	16.8	41.0	32.8	33.3	16.2	0.0	0.0	31.0	0.0	0.0
LnGrp LOS	D	B	B	D	C	C	B			C		
Approach Vol, veh/h		1135			562			45			482	
Approach Delay, s/veh		25.7			33.2			16.2			31.0	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	37.4		30.3	21.1	22.2		30.3
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	31.2		28.4	18.4	17.8		28.4
Max Q Clear Time (g_c+I1), s	2.7	14.9		24.5	16.4	13.1		3.4
Green Ext Time (p_c), s	0.0	6.8		1.2	0.1	2.9		3.6

Intersection Summary	
HCM 2010 Ctrl Delay	28.5
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	351	398	200	159	334	204
Future Volume (vph)	351	398	200	159	334	204
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	15.8	32.8	32.8
Total Split (s)	33.2	33.2	14.0	46.8	32.8	32.8
Total Split (%)	41.5%	41.5%	17.5%	58.5%	41.0%	41.0%
Yellow Time (s)	3.6	5.2	3.6	4.8	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	5.8	5.8	5.8
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	19.0	17.3	9.8	32.5	18.0	18.0
Actuated g/C Ratio	0.30	0.28	0.16	0.52	0.29	0.29
v/c Ratio	0.77	0.59	0.85	0.18	0.69	0.37
Control Delay	31.6	6.0	62.5	9.5	28.1	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	6.0	62.5	9.5	28.1	5.1
LOS	C	A	E	A	C	A
Approach Delay				39.1	19.4	
Approach LOS				D	B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 62.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	351	0	398	0	0	0	200	159	0	0	334	204
Future Volume (veh/h)	351	0	398	0	0	0	200	159	0	0	334	204
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	0	1800				1700	1800	0	0	1800	1800
Adj Flow Rate, veh/h	377	0	428				215	171	0	0	359	219
Adj No. of Lanes	1	0	1				1	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	514	0	486				256	910	0	0	485	402
Arrive On Green	0.32	0.00	0.32				0.16	0.51	0.00	0.00	0.27	0.27
Sat Flow, veh/h	1619	0	1530				1619	1800	0	0	1800	1493
Grp Volume(v), veh/h	377	0	428				215	171	0	0	359	219
Grp Sat Flow(s),veh/h/ln	1619	0	1530				1619	1800	0	0	1800	1493
Q Serve(g_s), s	12.2	0.0	15.6				7.6	3.1	0.0	0.0	10.7	7.4
Cycle Q Clear(g_c), s	12.2	0.0	15.6				7.6	3.1	0.0	0.0	10.7	7.4
Prop In Lane	1.00		1.00				1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	514	0	486				256	910	0	0	485	402
V/C Ratio(X)	0.73	0.00	0.88				0.84	0.19	0.00	0.00	0.74	0.54
Avail Cap(c_a), veh/h	787	0	744				259	1254	0	0	826	685
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	19.0				24.1	7.9	0.0	0.0	19.6	18.4
Incr Delay (d2), s/veh	0.8	0.0	5.4				20.0	0.1	0.0	0.0	2.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	12.4				4.8	1.5	0.0	0.0	5.6	6.3
LnGrp Delay(d),s/veh	18.6	0.0	24.5				44.0	8.0	0.0	0.0	21.9	19.6
LnGrp LOS	B		C				D	A			C	B
Approach Vol, veh/h		805						386			578	
Approach Delay, s/veh		21.7						28.1			21.0	
Approach LOS		C						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		35.6		23.3	13.9	21.7		
Change Period (Y+Rc), s		5.8		4.6	4.6	5.8		
Max Green Setting (Gmax), s		41.0		28.6	9.4	27.0		
Max Q Clear Time (g_c+I1), s		5.1		17.6	9.6	12.7		
Green Ext Time (p_c), s		3.9		1.1	0.0	3.1		

Intersection Summary	
HCM 2010 Ctrl Delay	22.9
HCM 2010 LOS	C

APPENDIX 8.13:

OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	431	427	381	500	1076	1155	537
v/c Ratio	0.95	0.93	0.77	0.93	0.54	0.92	0.61
Control Delay	64.7	59.5	34.1	51.2	17.9	41.1	5.3
Queue Delay	2.3	1.7	0.0	0.0	1.3	0.0	0.0
Total Delay	67.0	61.2	34.1	51.2	19.2	41.1	5.3
Queue Length 50th (ft)	250	252	158	157	270	328	0
Queue Length 95th (ft)	#443	#452	#307	m#246	340	#465	68
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	460	467	499	539	2011	1252	883
Starvation Cap Reductn	0	0	0	0	666	0	0
Spillback Cap Reductn	8	8	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.93	0.76	0.93	0.80	0.92	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	336	355	344	1186	702	331	1617
v/c Ratio	0.85	0.84	0.80	0.77	0.66	0.81	0.76
Control Delay	52.2	43.0	37.9	25.9	4.9	45.4	5.3
Queue Delay	0.3	0.2	0.0	0.0	0.0	0.0	1.1
Total Delay	52.4	43.2	37.9	25.9	4.9	45.4	6.3
Queue Length 50th (ft)	182	158	143	308	0	85	300
Queue Length 95th (ft)	#317	#308	#257	398	69	m95	m338
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900						
Base Capacity (vph)	443	463	476	1543	1063	421	2141
Starvation Cap Reductn	0	0	0	0	0	0	277
Spillback Cap Reductn	6	5	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.78	0.72	0.77	0.66	0.79	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	935	453	276	70	343	310	24	41
v/c Ratio	1.26	0.85	0.14	0.89	0.83	0.64	0.09	0.11
Control Delay	165.2	28.6	4.9	130.3	23.2	52.9	41.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	165.2	28.6	4.9	130.3	23.2	52.9	41.0	0.6
Queue Length 50th (ft)	~489	138	11	55	0	119	16	0
Queue Length 95th (ft)	#654	#569	62	#147	#140	148	37	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	745	532	2017	79	420	757	435	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	0.85	0.14	0.89	0.82	0.41	0.06	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	397	389	359	561	1152	1015	589
v/c Ratio	0.95	0.92	0.79	0.87	0.55	0.83	0.65
Control Delay	67.8	58.9	37.6	41.1	18.7	34.6	5.8
Queue Delay	0.0	0.0	0.0	0.0	1.9	0.0	0.0
Total Delay	67.8	58.9	37.6	41.1	20.5	34.6	5.8
Queue Length 50th (ft)	230	224	152	171	285	282	0
Queue Length 95th (ft)	#416	#412	#300	m#231	363	#397	78
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	426	434	460	678	2092	1218	911
Starvation Cap Reductn	0	0	0	0	738	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.90	0.78	0.83	0.85	0.83	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	339	322	319	1254	786	326	1323
v/c Ratio	0.89	0.81	0.76	0.79	0.72	0.84	0.61
Control Delay	59.1	42.2	35.9	25.1	6.1	50.1	2.6
Queue Delay	4.9	1.9	0.0	0.0	0.0	0.0	0.5
Total Delay	64.0	44.0	35.9	25.1	6.1	50.1	3.1
Queue Length 50th (ft)	190	151	130	315	11	82	12
Queue Length 95th (ft)	#344	#293	#244	405	102	m103	m11
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900						
Base Capacity (vph)	409	425	445	1597	1099	391	2173
Starvation Cap Reductn	0	0	0	0	0	0	396
Spillback Cap Reductn	34	31	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.82	0.72	0.79	0.72	0.83	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	384	108	251	32	16	794	154	167
v/c Ratio	0.35	0.62	0.16	0.35	0.08	0.80	0.27	0.28
Control Delay	34.9	75.1	12.9	64.5	0.9	43.8	30.7	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	75.1	12.9	64.5	0.9	43.8	30.7	5.1
Queue Length 50th (ft)	124	77	36	24	0	286	88	0
Queue Length 95th (ft)	193	124	57	58	0	335	133	45
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1090	235	1618	100	190	1161	667	672
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.46	0.16	0.32	0.08	0.68	0.23	0.25

Intersection Summary

APPENDIX 8.14:

OPENING YEAR CUMULATIVE (2020) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	480	470	381	514	1080	1172	537
v/c Ratio	1.04	1.00	0.77	0.95	0.54	0.95	0.61
Control Delay	86.7	75.8	33.5	54.4	18.3	45.0	5.3
Queue Delay	9.0	6.8	0.0	0.0	1.4	0.0	0.0
Total Delay	95.7	82.6	33.5	54.4	19.7	45.0	5.3
Queue Length 50th (ft)	~314	~291	160	162	271	335	0
Queue Length 95th (ft)	#511	#516	#308	m#249	342	#476	68
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	460	468	498	539	1995	1235	878
Starvation Cap Reductn	0	0	0	0	667	0	0
Spillback Cap Reductn	11	11	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	1.03	0.77	0.95	0.81	0.95	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	336	389	382	1203	720	331	1727
v/c Ratio	0.84	0.91	0.87	0.79	0.67	0.81	0.81
Control Delay	50.3	52.8	46.1	26.8	5.1	44.1	5.7
Queue Delay	0.4	0.7	0.0	0.0	0.0	0.0	2.3
Total Delay	50.7	53.5	46.1	26.8	5.1	44.1	8.0
Queue Length 50th (ft)	182	184	169	315	0	86	317
Queue Length 95th (ft)	#317	#362	#328	407	70	m90	m282
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900						
Base Capacity (vph)	443	462	476	1530	1069	421	2126
Starvation Cap Reductn	0	0	0	0	0	0	264
Spillback Cap Reductn	9	8	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.86	0.80	0.79	0.67	0.79	0.93

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	948	453	278	70	343	310	24	41
v/c Ratio	1.28	0.85	0.14	0.89	0.83	0.64	0.09	0.11
Control Delay	175.6	28.6	4.8	130.3	23.2	52.9	41.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	175.6	28.6	4.8	130.3	23.2	52.9	41.0	0.6
Queue Length 50th (ft)	~504	127	11	55	0	119	16	0
Queue Length 95th (ft)	#663	#572	61	#147	#140	148	37	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	740	535	2017	79	420	757	435	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.85	0.14	0.89	0.82	0.41	0.06	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	404	397	368	629	1167	1019	589
v/c Ratio	0.96	0.93	0.81	0.94	0.56	0.86	0.65
Control Delay	69.6	61.4	38.9	46.3	18.9	36.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	2.3	0.0	0.0
Total Delay	69.6	61.4	38.9	46.3	21.2	36.9	6.0
Queue Length 50th (ft)	236	231	158	196	297	284	0
Queue Length 95th (ft)	#426	#425	#314	m#259	375	#400	78
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	426	433	460	678	2085	1180	901
Starvation Cap Reductn	0	0	0	0	745	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.92	0.80	0.93	0.87	0.86	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	347	328	324	1336	870	326	1351
v/c Ratio	0.90	0.82	0.76	0.84	0.79	0.85	0.62
Control Delay	60.4	44.0	36.2	27.7	9.6	51.1	2.4
Queue Delay	9.3	3.5	0.0	0.0	0.0	0.0	0.5
Total Delay	69.6	47.4	36.2	27.7	9.6	51.1	2.9
Queue Length 50th (ft)	196	158	133	348	40	82	13
Queue Length 95th (ft)	#355	#305	#261	#451	214	m99	m11
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900						
Base Capacity (vph)	409	421	445	1592	1098	386	2162
Starvation Cap Reductn	0	0	0	0	0	0	385
Spillback Cap Reductn	43	40	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.86	0.73	0.84	0.79	0.84	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	387	108	261	32	16	794	154	167
v/c Ratio	0.36	0.64	0.16	0.37	0.08	0.78	0.26	0.27
Control Delay	35.0	78.0	12.8	66.7	0.9	41.6	29.5	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	78.0	12.8	66.7	0.9	41.6	29.5	4.7
Queue Length 50th (ft)	125	78	35	24	0	284	87	0
Queue Length 95th (ft)	192	m126	66	59	0	317	126	43
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1085	182	1596	91	190	1292	742	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.59	0.16	0.35	0.08	0.61	0.21	0.23

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 9.1:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1439	514	28	1254	628	133	389
Future Volume (vph)	1439	514	28	1254	628	133	389
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	26.5	26.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.44	0.44	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.51	0.53	0.20	0.70	0.72	0.68	0.65
Control Delay	13.9	4.0	28.5	9.2	27.0	24.5	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	4.0	28.5	9.2	27.0	24.5	17.6
LOS	B	A	C	A	C	C	B
Approach Delay	11.3			9.6		23.0	
Approach LOS	B			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1439	514	28	1254	0	0	0	0	628	133	389
Future Volume (veh/h)	0	1439	514	28	1254	0	0	0	0	628	133	389
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0				1800	1900	1900
Adj Flow Rate, veh/h	0	1484	460	29	1293	0				745	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2569	634	55	1835	0				1143	0	538
Arrive On Green	0.00	0.39	0.39	0.04	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6802	1614	1714	3705	0				3429	0	1615
Grp Volume(v), veh/h	0	1484	460	29	1293	0				745	0	0
Grp Sat Flow(s),veh/h/ln	0	1634	1614	1714	1805	0				1714	0	1615
Q Serve(g_s), s	0.0	10.7	14.5	1.0	13.3	0.0				11.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.7	14.5	1.0	13.3	0.0				11.1	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2569	634	55	1835	0				1143	0	538
V/C Ratio(X)	0.00	0.58	0.73	0.53	0.70	0.00				0.65	0.00	0.00
Avail Cap(c_a), veh/h	0	2569	634	143	1835	0				1143	0	538
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.18	0.18	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	14.3	15.5	28.3	6.9	0.0				17.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	4.1	0.5	0.4	0.0				2.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.8	7.1	0.5	6.3	0.0				5.6	0.0	0.0
LnGrp Delay(d),s/veh	0.0	14.6	19.6	28.8	7.3	0.0				19.9	0.0	0.0
LnGrp LOS		B	B	C	A					B		
Approach Vol, veh/h		1944			1322						745	
Approach Delay, s/veh		15.8			7.8						19.9	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.9	28.1		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	3.0	16.5		13.1		15.3		
Green Ext Time (p_c), s	0.0	3.8		1.4		13.9		

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	729	1338	772	432	510	261
Future Volume (vph)	729	1338	772	432	510	261
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	15.0	47.0	32.0	32.0	13.0	13.0
Total Split (%)	25.0%	78.3%	53.3%	53.3%	21.7%	21.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	10.0	40.5	25.5	25.5	7.0	7.0
Actuated g/C Ratio	0.17	0.68	0.42	0.42	0.12	0.12
v/c Ratio	1.47	0.58	0.53	0.60	1.96	1.60
Control Delay	245.0	6.9	14.4	12.8	471.6	303.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	245.0	6.9	14.4	12.8	471.6	303.8
LOS	F	A	B	B	F	F
Approach Delay		90.9	13.8			360.3
Approach LOS		F	B			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.96	
Intersection Signal Delay: 132.2	Intersection LOS: F
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	729	1338	0	0	772	432	510	261	228	0	0	0
Future Volume (veh/h)	729	1338	0	0	772	432	510	261	228	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1900	0	0	1900	1900	1800	1900	1900			
Adj Flow Rate, veh/h	767	1408	0	0	813	454	350	537	237			
Adj No. of Lanes	2	2	0	0	2	1	1	2	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	523	2437	0	0	1534	676	200	292	129			
Arrive On Green	0.17	0.68	0.00	0.00	0.43	0.43	0.12	0.12	0.12			
Sat Flow, veh/h	3141	3705	0	0	3705	1589	1714	2504	1102			
Grp Volume(v), veh/h	767	1408	0	0	813	454	350	407	367			
Grp Sat Flow(s),veh/h/ln	1570	1805	0	0	1805	1589	1714	1900	1706			
Q Serve(g_s), s	10.0	12.5	0.0	0.0	10.0	13.8	7.0	7.0	7.0			
Cycle Q Clear(g_c), s	10.0	12.5	0.0	0.0	10.0	13.8	7.0	7.0	7.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.65			
Lane Grp Cap(c), veh/h	523	2437	0	0	1534	676	200	222	199			
V/C Ratio(X)	1.47	0.58	0.00	0.00	0.53	0.67	1.75	1.84	1.84			
Avail Cap(c_a), veh/h	523	2437	0	0	1534	676	200	222	199			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.81	0.81	0.00	0.00	0.49	0.49	1.00	1.00	1.00			
Uniform Delay (d), s/veh	25.0	5.2	0.0	0.0	12.8	13.9	26.5	26.5	26.5			
Incr Delay (d2), s/veh	217.8	0.8	0.0	0.0	0.6	2.6	357.3	393.4	398.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	20.1	6.3	0.0	0.0	5.1	6.4	23.1	27.9	25.3			
LnGrp Delay(d),s/veh	242.8	6.0	0.0	0.0	13.4	16.5	383.8	419.9	425.2			
LnGrp LOS	F	A			B	B	F	F	F			
Approach Vol, veh/h		2175			1267			1124				
Approach Delay, s/veh		89.5			14.6			410.4				
Approach LOS		F			B			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.0			15.0	32.0		13.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		40.5			10.0	25.5		7.0
Max Q Clear Time (g_c+I1), s		14.5			12.0	15.8		9.0
Green Ext Time (p_c), s		19.8			0.0	8.5		0.0

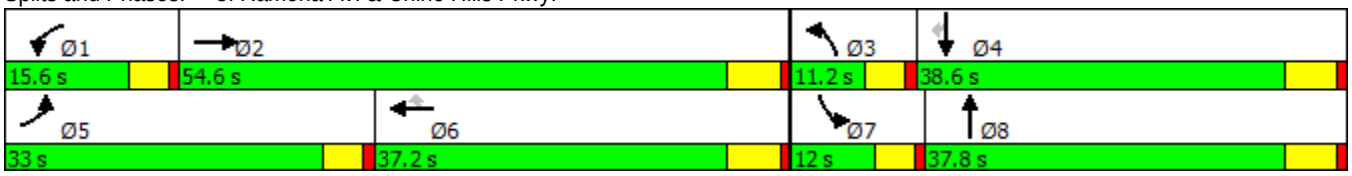
Intersection Summary	
HCM 2010 Ctrl Delay	147.7
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	500	1057	142	850	125	28	459	108	369	327
Future Volume (vph)	500	1057	142	850	125	28	459	108	369	327
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	28.4	48.8	11.0	31.4	31.4	6.0	32.0	7.4	37.3	37.3
Actuated g/C Ratio	0.24	0.41	0.09	0.26	0.26	0.05	0.27	0.06	0.31	0.31
v/c Ratio	1.30	0.53	0.96	0.95	0.25	0.34	0.73	1.09	0.35	0.47
Control Delay	190.7	28.1	115.8	63.0	5.0	65.7	41.9	165.2	34.1	5.9
Queue Delay	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	190.7	29.0	115.8	63.0	5.0	65.7	41.9	165.2	34.1	5.9
LOS	F	C	F	E	A	E	D	F	C	A
Approach Delay		80.6		63.2			42.8		40.3	
Approach LOS		F		E			D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 61.9	Intersection LOS: E
Intersection Capacity Utilization 103.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	1057	9	142	850	125	28	459	207	108	369	327
Future Volume (veh/h)	500	1057	9	142	850	125	28	459	207	108	369	327
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	526	1113	8	149	895	115	29	483	150	114	388	248
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	406	2160	16	157	944	416	44	722	223	106	1092	480
Arrive On Green	0.24	0.41	0.41	0.09	0.26	0.26	0.03	0.27	0.27	0.06	0.30	0.30
Sat Flow, veh/h	1714	5312	38	1714	3610	1591	1714	2708	835	1714	3610	1587
Grp Volume(v), veh/h	526	724	397	149	895	115	29	321	312	114	388	248
Grp Sat Flow(s),veh/h/ln	1714	1729	1893	1714	1805	1591	1714	1805	1738	1714	1805	1587
Q Serve(g_s), s	28.4	18.9	18.9	10.4	29.2	6.9	2.0	19.0	19.3	7.4	10.1	15.5
Cycle Q Clear(g_c), s	28.4	18.9	18.9	10.4	29.2	6.9	2.0	19.0	19.3	7.4	10.1	15.5
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	406	1406	770	157	944	416	44	481	463	106	1092	480
V/C Ratio(X)	1.30	0.52	0.52	0.95	0.95	0.28	0.66	0.67	0.67	1.08	0.36	0.52
Avail Cap(c_a), veh/h	406	1406	770	157	945	416	94	481	463	106	1092	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	26.7	26.7	54.2	43.5	35.3	57.9	39.2	39.3	56.3	32.7	34.6
Incr Delay (d2), s/veh	150.6	0.4	0.8	55.8	18.1	0.5	6.0	7.1	7.6	110.2	0.9	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.4	9.0	10.0	7.4	16.9	3.1	1.0	10.4	10.3	6.7	5.1	7.3
LnGrp Delay(d),s/veh	196.4	27.2	27.5	110.0	61.6	35.8	63.9	46.4	46.9	166.6	33.6	38.5
LnGrp LOS	F	C	C	F	E	D	E	D	D	F	C	D
Approach Vol, veh/h		1647			1159			662			750	
Approach Delay, s/veh		81.3			65.3			47.4			55.4	
Approach LOS		F			E			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	54.6	7.7	42.1	33.0	37.2	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	12.4	20.9	4.0	17.5	30.4	31.2	9.4	21.3
Green Ext Time (p_c), s	0.0	20.7	0.0	6.1	0.0	0.2	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	67.0
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1077	166	44	898	142	41
Future Vol, veh/h	1077	166	44	898	142	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1184	182	48	987	156	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1184	0	1774	592
Stage 1	-	-	-	-	1184	-
Stage 2	-	-	-	-	590	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	597	-	~ 76	454
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	597	-	~ 70	454
Mov Cap-2 Maneuver	-	-	-	-	222	-
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	480	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	59.3
HCM LOS			F

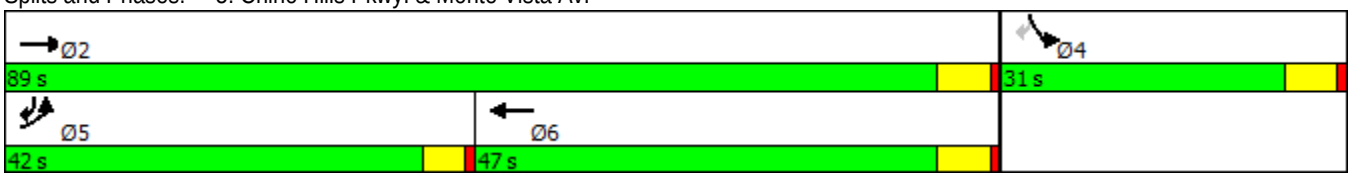
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	251	-	-	597	-
HCM Lane V/C Ratio	0.801	-	-	0.081	-
HCM Control Delay (s)	59.3	-	-	11.6	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	6.1	-	-	0.3	-

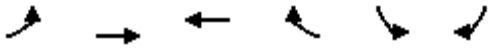
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	288	831	814	100	128
Future Volume (vph)	288	831	814	100	128
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	89.0	47.0	31.0	42.0
Total Split (%)	35.0%	74.2%	39.2%	25.8%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	23.0	62.3	34.7	25.7	49.9
Actuated g/C Ratio	0.23	0.62	0.35	0.26	0.50
v/c Ratio	0.80	0.40	0.77	0.14	0.17
Control Delay	52.2	9.5	34.2	32.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	9.5	34.2	32.9	9.7
LOS	D	A	C	C	A
Approach Delay		20.5	34.2	19.9	
Approach LOS		C	C	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 99.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 25.9	Intersection LOS: C
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	288	831	814	73	100	128
Future Volume (veh/h)	288	831	814	73	100	128
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1900	1700	1900
Adj Flow Rate, veh/h	313	903	885	79	109	64
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	347	2259	1263	113	805	741
Arrive On Green	0.20	0.63	0.38	0.38	0.26	0.26
Sat Flow, veh/h	1714	3705	3448	299	3141	1615
Grp Volume(v), veh/h	313	903	476	488	109	64
Grp Sat Flow(s),veh/h/ln	1714	1805	1805	1847	1570	1615
Q Serve(g_s), s	17.5	12.3	22.0	22.0	2.6	2.2
Cycle Q Clear(g_c), s	17.5	12.3	22.0	22.0	2.6	2.2
Prop In Lane	1.00			0.16	1.00	1.00
Lane Grp Cap(c), veh/h	347	2259	680	696	805	741
V/C Ratio(X)	0.90	0.40	0.70	0.70	0.14	0.09
Avail Cap(c_a), veh/h	652	3054	756	774	805	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	9.2	26.0	26.0	28.2	15.0
Incr Delay (d2), s/veh	3.6	0.2	3.0	2.9	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	6.1	11.5	11.8	1.2	2.7
LnGrp Delay(d),s/veh	41.8	9.3	28.9	28.9	28.5	15.2
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		1216	964		173	
Approach Delay, s/veh		17.7	28.9		23.6	
Approach LOS		B	C		C	

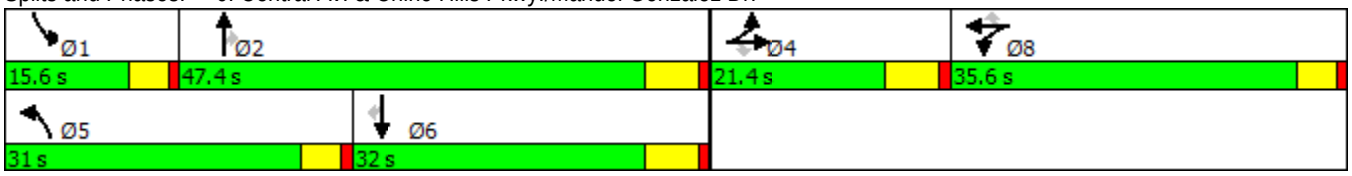
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		67.4		31.0	24.5	42.9		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		83.2		25.2	37.4	41.2		
Max Q Clear Time (g_c+I1), s		14.3		4.6	19.5	24.0		
Green Ext Time (p_c), s		30.9		0.5	0.4	13.1		

Intersection Summary	
HCM 2010 Ctrl Delay	22.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	439	60	317	2	4	8	469	1078	51	74	884	288
Future Volume (vph)	439	60	317	2	4	8	469	1078	51	74	884	288
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	15.9	13.5	13.5	13.5	26.9	47.5	47.5	8.3	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.98	0.94	0.62	0.01	0.01	0.02	1.05	0.65	0.06	0.53	0.94	0.55
Control Delay	91.3	81.5	10.2	35.5	35.5	0.1	89.2	23.5	0.1	57.5	52.4	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.3	81.5	10.2	35.5	35.5	0.1	89.2	23.5	0.1	57.5	52.4	19.2
LOS	F	F	B	D	D	A	F	C	A	E	D	B
Approach Delay		56.7			14.3			42.0			45.1	
Approach LOS		E			B			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 46.2	Intersection LOS: D
Intersection Capacity Utilization 85.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	439	60	317	2	4	8	469	1078	51	74	884	288
Future Volume (veh/h)	439	60	317	2	4	8	469	1078	51	74	884	288
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	523	0	249	2	4	4	510	1172	43	80	961	258
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	586	0	276	42	47	40	496	1867	818	102	1037	458
Arrive On Green	0.17	0.00	0.17	0.02	0.02	0.02	0.29	0.52	0.52	0.06	0.29	0.29
Sat Flow, veh/h	3429	0	1615	1714	1900	1615	1714	3610	1582	1714	3610	1594
Grp Volume(v), veh/h	523	0	249	2	4	4	510	1172	43	80	961	258
Grp Sat Flow(s),veh/h/ln	1714	0	1615	1714	1900	1615	1714	1805	1582	1714	1805	1594
Q Serve(g_s), s	13.6	0.0	13.8	0.1	0.2	0.2	26.4	21.2	1.2	4.2	23.6	12.6
Cycle Q Clear(g_c), s	13.6	0.0	13.8	0.1	0.2	0.2	26.4	21.2	1.2	4.2	23.6	12.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	586	0	276	42	47	40	496	1867	818	102	1037	458
V/C Ratio(X)	0.89	0.00	0.90	0.05	0.09	0.10	1.03	0.63	0.05	0.79	0.93	0.56
Avail Cap(c_a), veh/h	586	0	276	582	646	549	496	1867	818	207	1037	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	0.0	37.1	43.5	43.5	43.5	32.4	15.7	10.9	42.3	31.6	27.7
Incr Delay (d2), s/veh	15.9	0.0	30.1	0.5	0.8	1.1	47.8	1.6	0.1	5.0	15.1	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	8.4	0.1	0.1	0.1	19.0	10.8	0.6	2.1	13.9	6.1
LnGrp Delay(d),s/veh	52.9	0.0	67.2	43.9	44.3	44.6	80.2	17.4	11.1	47.3	46.7	32.6
LnGrp LOS	D		E	D	D	D	F	B	B	D	D	C
Approach Vol, veh/h		772			10			1725			1299	
Approach Delay, s/veh		57.5			44.3			35.8			43.9	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	53.0		21.4	31.0	32.0		6.8
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	6.2	23.2		15.8	28.4	25.6		2.2
Green Ext Time (p_c), s	0.0	16.0		0.0	0.0	0.6		0.0

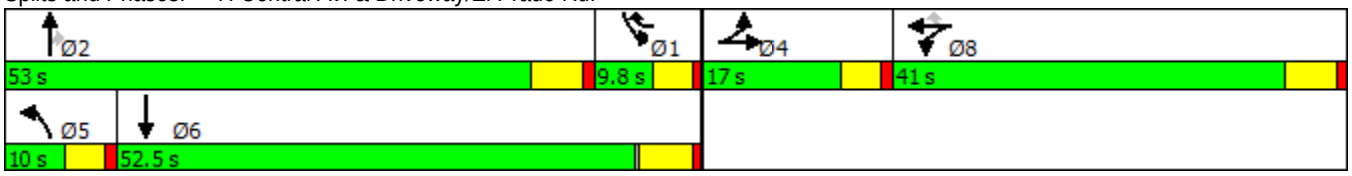
Intersection Summary	
HCM 2010 Ctrl Delay	43.0
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	386	4	214	2	666	403	267	794
Future Volume (vph)	1	1	386	4	214	2	666	403	267	794
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	17.0	17.0	41.0	41.0	9.8	10.0	53.0	53.0	9.8	52.5
Total Split (%)	14.1%	14.1%	33.9%	33.9%	8.1%	8.3%	43.9%	43.9%	8.1%	43.5%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.1	10.1	17.1	17.1	27.5	5.1	47.9	47.9	5.3	56.2
Actuated g/C Ratio	0.11	0.11	0.19	0.19	0.31	0.06	0.54	0.54	0.06	0.63
v/c Ratio	0.01	0.01	0.69	0.66	0.36	0.02	0.38	0.42	2.94	0.27
Control Delay	42.0	36.0	45.6	43.8	4.1	46.0	14.4	3.0	922.9	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	36.0	45.6	43.8	4.1	46.0	14.4	3.0	922.9	10.0
LOS	D	D	D	D	A	D	B	A	F	A
Approach Delay		38.0		30.3			10.2			237.7
Approach LOS		D		C			B			F

Intersection Summary	
Cycle Length: 120.8	
Actuated Cycle Length: 89	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.94	
Intersection Signal Delay: 103.3	Intersection LOS: F
Intersection Capacity Utilization 65.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	386	4	214	2	666	403	267	794	11
Future Volume (veh/h)	1	1	1	386	4	214	2	666	403	267	794	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	1	1	1	432	0	95	2	740	279	297	882	10
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	14	7	7	558	0	356	5	1899	839	99	3145	36
Arrive On Green	0.01	0.01	0.01	0.16	0.00	0.16	0.00	0.53	0.53	0.06	0.59	0.59
Sat Flow, veh/h	1714	873	873	3429	0	1615	1714	3610	1595	1714	5288	60
Grp Volume(v), veh/h	1	0	2	432	0	95	2	740	279	297	577	315
Grp Sat Flow(s),veh/h/ln	1714	0	1746	1714	0	1615	1714	1805	1595	1714	1729	1889
Q Serve(g_s), s	0.1	0.0	0.1	10.8	0.0	0.0	0.1	11.0	9.0	5.2	7.3	7.3
Cycle Q Clear(g_c), s	0.1	0.0	0.1	10.8	0.0	0.0	0.1	11.0	9.0	5.2	7.3	7.3
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	14	0	14	558	0	356	5	1899	839	99	2057	1124
V/C Ratio(X)	0.07	0.00	0.14	0.77	0.00	0.27	0.43	0.39	0.33	2.99	0.28	0.28
Avail Cap(c_a), veh/h	237	0	241	1345	0	727	103	1899	839	99	2057	1124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	0.0	44.2	36.0	0.0	28.9	44.7	12.7	12.2	42.3	8.8	8.8
Incr Delay (d2), s/veh	0.8	0.0	1.7	2.3	0.0	0.4	21.7	0.6	1.1	921.5	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	5.3	0.0	2.0	0.1	5.6	4.2	27.9	3.5	4.0
LnGrp Delay(d),s/veh	45.0	0.0	45.9	38.3	0.0	29.3	66.3	13.3	13.3	963.8	9.2	9.5
LnGrp LOS	D		D	D		C	E	B	B	F	A	A
Approach Vol, veh/h		3			527			1021			1189	
Approach Delay, s/veh		45.6			36.7			13.4			247.7	
Approach LOS		D			D			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	53.0		5.3	4.8	59.2		20.4
Change Period (Y+Rc), s	5.8	* 5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	5.2	* 47		12.4	5.4	46.7		35.2
Max Q Clear Time (g_c+I1), s	7.2	13.0		2.1	2.1	9.3		12.8
Green Ext Time (p_c), s	0.0	9.7		0.0	0.0	9.1		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	119.6
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1288	746	101
Future Volume (vph)	1288	746	101
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	68.0	68.0	22.0
Total Split (%)	75.6%	75.6%	24.4%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	63.5	63.5	17.0
Actuated g/C Ratio	0.71	0.71	0.19
v/c Ratio	0.42	0.25	1.44dr
Control Delay	3.2	4.9	66.9
Queue Delay	0.0	0.0	0.0
Total Delay	3.2	4.9	66.9
LOS	A	A	E
Approach Delay	3.2	4.9	66.9
Approach LOS	A	A	E

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1288	0	0	746	101	405
Future Volume (veh/h)	1288	0	0	746	101	405
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	0	1900	1800	1900
Adj Flow Rate, veh/h	1552	0	0	899	122	295
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3660	0	0	3660	324	305
Arrive On Green	1.00	0.00	0.00	0.71	0.19	0.19
Sat Flow, veh/h	5529	0	0	5529	1714	1615
Grp Volume(v), veh/h	1552	0	0	899	122	295
Grp Sat Flow(s),veh/h/ln	1729	0	0	1729	1714	1615
Q Serve(g_s), s	0.0	0.0	0.0	5.6	5.6	16.3
Cycle Q Clear(g_c), s	0.0	0.0	0.0	5.6	5.6	16.3
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	3660	0	0	3660	324	305
V/C Ratio(X)	0.42	0.00	0.00	0.25	0.38	0.97
Avail Cap(c_a), veh/h	3660	0	0	3660	324	305
HCM Platoon Ratio	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	4.7	31.9	36.2
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.2	0.3	42.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	2.6	2.7	10.9
LnGrp Delay(d),s/veh	0.4	0.0	0.0	4.9	32.1	78.5
LnGrp LOS	A			A	C	E
Approach Vol, veh/h	1552			899	417	
Approach Delay, s/veh	0.4			4.9	64.9	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		68.0				68.0		22.0
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		63.5				63.5		17.0
Max Q Clear Time (g_c+I1), s		2.0				7.6		18.3
Green Ext Time (p_c), s		18.3				18.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1800	94	327	323	0
Future Volume (vph)	1800	94	327	323	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	32.0	32.0	32.0	58.0	58.0
Total Split (%)	35.6%	35.6%	35.6%	64.4%	64.4%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	43.4	43.4	43.4	38.6	38.6
Actuated g/C Ratio	0.48	0.48	0.48	0.43	0.43
v/c Ratio	0.91	0.15	0.17	0.53	0.82
Control Delay	31.5	7.3	13.0	20.3	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	7.3	13.0	20.3	24.0
LOS	C	A	B	C	C
Approach Delay	30.3		13.0		22.6
Approach LOS	C		B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 26.4	Intersection LOS: C
Intersection Capacity Utilization 65.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1800	94	0	327	0	0	0	0	323	0	467
Future Volume (veh/h)	0	1800	94	0	327	0	0	0	0	323	0	467
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	0				1800	1900	1900
Adj Flow Rate, veh/h	0	2278	0	0	414	0				409	0	450
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	3099	965	0	3099	0				538	0	507
Arrive On Green	0.00	0.60	0.00	0.00	0.20	0.00				0.31	0.00	0.31
Sat Flow, veh/h	0	5358	1615	0	5529	0				1714	0	1615
Grp Volume(v), veh/h	0	2278	0	0	414	0				409	0	450
Grp Sat Flow(s),veh/h/ln	0	1729	1615	0	1729	0				1714	0	1615
Q Serve(g_s), s	0.0	28.4	0.0	0.0	5.9	0.0				19.4	0.0	23.9
Cycle Q Clear(g_c), s	0.0	28.4	0.0	0.0	5.9	0.0				19.4	0.0	23.9
Prop In Lane	0.00		1.00	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3099	965	0	3099	0				538	0	507
V/C Ratio(X)	0.00	0.74	0.00	0.00	0.13	0.00				0.76	0.00	0.89
Avail Cap(c_a), veh/h	0	3099	965	0	3099	0				1038	0	978
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.0	0.0	0.0	16.9	0.0				27.8	0.0	29.4
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.0	0.1	0.0				0.8	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.7	0.0	0.0	2.9	0.0				9.2	0.0	10.9
LnGrp Delay(d),s/veh	0.0	14.6	0.0	0.0	17.0	0.0				28.7	0.0	31.5
LnGrp LOS		B			B					C		C
Approach Vol, veh/h		2278			414						859	
Approach Delay, s/veh		14.6			17.0						30.2	
Approach LOS		B			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		58.3		31.7		58.3		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		27.5		54.5		27.5		
Max Q Clear Time (g_c+I1), s		30.4		25.9		7.9		
Green Ext Time (p_c), s		0.0		2.4		15.3		

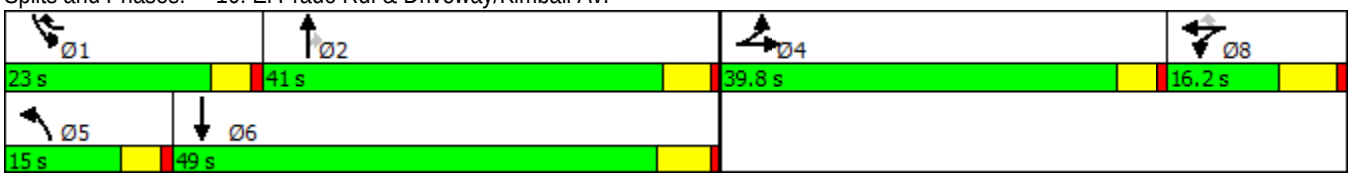
Intersection Summary	
HCM 2010 Ctrl Delay	18.7
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	1	30	515	6	35	56	534	59
Future Volume (vph)	13	1	30	515	6	35	56	534	59
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	39.8	39.8	16.2	23.0	15.0	41.0	41.0	23.0	49.0
Total Split (%)	33.2%	33.2%	13.5%	19.2%	12.5%	34.2%	34.2%	19.2%	40.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.6	12.6	10.3	35.7	5.2	10.3	10.3	19.0	23.4
Actuated g/C Ratio	0.20	0.20	0.16	0.56	0.08	0.16	0.16	0.30	0.37
v/c Ratio	0.04	0.01	0.42	0.46	0.04	0.12	0.15	1.06	0.09
Control Delay	22.4	18.0	32.3	3.0	33.7	28.6	0.8	84.8	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	18.0	32.3	3.0	33.7	28.6	0.8	84.8	11.2
LOS	C	B	C	A	C	C	A	F	B
Approach Delay		21.6	8.6			12.9			72.5
Approach LOS		C	A			B			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 63.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 38.5	Intersection LOS: D
Intersection Capacity Utilization 61.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	2	91	30	515	6	35	56	534	59	49
Future Volume (veh/h)	13	1	2	91	30	515	6	35	56	534	59	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	13	1	1	93	31	271	6	36	57	545	60	50
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	32	32	222	74	741	139	307	261	510	744	558
Arrive On Green	0.04	0.04	0.04	0.16	0.16	0.16	0.08	0.16	0.16	0.30	0.38	0.38
Sat Flow, veh/h	1714	873	873	1373	458	1615	1714	1900	1615	1714	1967	1475
Grp Volume(v), veh/h	13	0	2	124	0	271	6	36	57	545	55	55
Grp Sat Flow(s),veh/h/ln	1714	0	1746	1831	0	1615	1714	1900	1615	1714	1805	1637
Q Serve(g_s), s	0.5	0.0	0.1	3.8	0.0	6.7	0.2	1.0	1.9	18.4	1.2	1.3
Cycle Q Clear(g_c), s	0.5	0.0	0.1	3.8	0.0	6.7	0.2	1.0	1.9	18.4	1.2	1.3
Prop In Lane	1.00		0.50	0.75		1.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	63	0	64	296	0	741	139	307	261	510	683	619
V/C Ratio(X)	0.21	0.00	0.03	0.42	0.00	0.37	0.04	0.12	0.22	1.07	0.08	0.09
Avail Cap(c_a), veh/h	975	0	993	296	0	741	288	1100	935	510	1261	1143
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	0.0	28.7	23.3	0.0	10.9	26.2	22.2	22.5	21.7	12.3	12.4
Incr Delay (d2), s/veh	1.6	0.0	0.2	0.9	0.0	0.3	0.0	0.2	0.4	59.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	2.0	0.0	3.0	0.1	0.5	0.9	16.9	0.6	0.6
LnGrp Delay(d),s/veh	30.5	0.0	28.9	24.3	0.0	11.2	26.3	22.3	22.9	81.2	12.4	12.4
LnGrp LOS	C		C	C		B	C	C	C	F	B	B
Approach Vol, veh/h		15			395			99			655	
Approach Delay, s/veh		30.3			15.3			22.9			69.7	
Approach LOS		C			B			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	15.8		6.9	9.6	29.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	18.4	* 36		35.2	10.4	43.2		10.0
Max Q Clear Time (g_c+I1), s	20.4	3.9		2.5	2.2	3.3		8.7
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	1.0		0.2

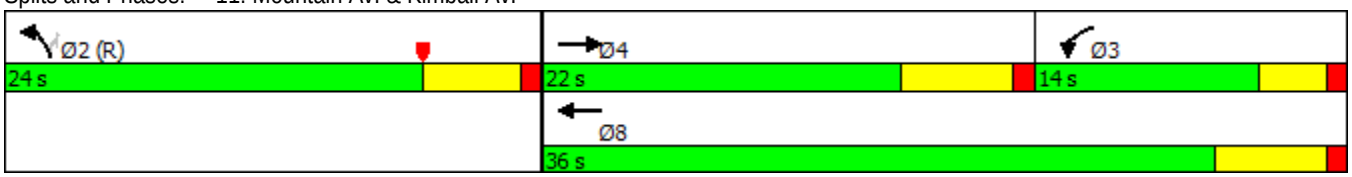
Intersection Summary	
HCM 2010 Ctrl Delay	46.7
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	552	101	596	39	72
Future Volume (vph)	552	101	596	39	72
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	14.0	36.0	24.0	24.0
Total Split (%)	36.7%	23.3%	60.0%	40.0%	40.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	13.8	8.1	23.7	25.0	25.0
Actuated g/C Ratio	0.23	0.14	0.40	0.42	0.42
v/c Ratio	0.75	0.45	0.44	0.06	0.10
Control Delay	27.0	30.2	13.3	14.2	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	30.2	13.3	14.2	5.0
LOS	C	C	B	B	A
Approach Delay	27.0		15.7	8.2	
Approach LOS	C		B	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 18.7 (31%), Referenced to phase 2:NBL and 6:, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 41.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	552	50	101	596	39	72
Future Volume (veh/h)	552	50	101	596	39	72
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	575	47	105	621	41	70
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	703	57	165	1460	698	658
Arrive On Green	0.21	0.21	0.10	0.40	0.41	0.41
Sat Flow, veh/h	3475	276	1714	3705	1714	1615
Grp Volume(v), veh/h	307	315	105	621	41	70
Grp Sat Flow(s),veh/h/ln	1805	1851	1714	1805	1714	1615
Q Serve(g_s), s	9.7	9.8	3.5	7.4	0.9	1.6
Cycle Q Clear(g_c), s	9.7	9.8	3.5	7.4	0.9	1.6
Prop In Lane		0.15	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	375	385	165	1460	698	658
V/C Ratio(X)	0.82	0.82	0.64	0.43	0.06	0.11
Avail Cap(c_a), veh/h	481	494	286	1805	698	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.86	0.86	1.00	1.00
Uniform Delay (d), s/veh	22.7	22.7	26.1	12.9	10.8	11.0
Incr Delay (d2), s/veh	3.8	3.8	1.3	0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	5.4	1.7	3.7	0.4	0.8
LnGrp Delay(d),s/veh	26.5	26.5	27.4	12.9	11.0	11.3
LnGrp LOS	C	C	C	B	B	B
Approach Vol, veh/h	622			726	111	
Approach Delay, s/veh	26.5			15.0	11.2	
Approach LOS	C			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		29.7	11.8	18.5				30.3
Change Period (Y+Rc), s		5.3	6.0	* 6				6.0
Max Green Setting (Gmax), s		18.7	10.0	* 16				30.0
Max Q Clear Time (g_c+I1), s		3.6	5.5	11.8				9.4
Green Ext Time (p_c), s		0.1	0.9	0.7				1.8

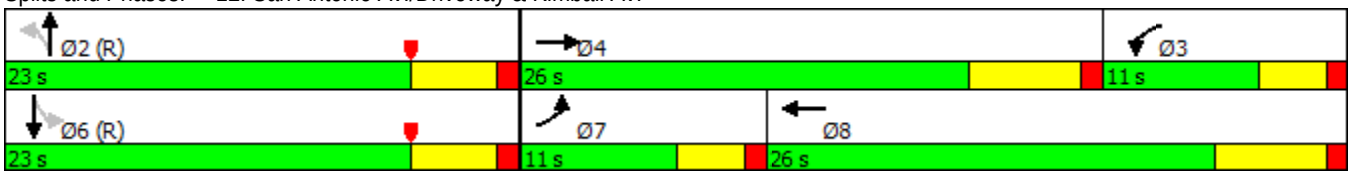
Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Notes

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	523	25	686	24	0		
Future Volume (vph)	523	25	686	24	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	26.0	11.0	26.0	23.0	23.0	23.0	11.0
Total Split (%)	43.3%	18.3%	43.3%	38.3%	38.3%	38%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lead	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	15.4	7.0	19.8	29.3	29.3		
Actuated g/C Ratio	0.26	0.12	0.33	0.49	0.49		
v/c Ratio	0.68	0.14	0.61	0.04	0.01		
Control Delay	15.3	25.6	18.4	12.4	0.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	15.3	25.6	18.4	12.4	0.0		
LOS	B	C	B	B	A		
Approach Delay	15.3		18.6		9.8		
Approach LOS	B		B		A		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 18.1 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 36.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	523	65	25	686	0	24	0	7	0	0	0
Future Volume (veh/h)	0	523	65	25	686	0	24	0	7	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	556	69	27	730	0	26	0	4	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	712	88	45	1252	0	928	0	761	120	896	0
Arrive On Green	0.00	0.07	0.07	0.03	0.35	0.00	0.47	0.00	0.47	0.00	0.00	0.00
Sat Flow, veh/h	1714	3225	399	1714	3705	0	1714	0	1615	1435	1900	0
Grp Volume(v), veh/h	0	310	315	27	730	0	26	0	4	0	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1819	1714	1805	0	1714	0	1615	1435	1900	0
Q Serve(g_s), s	0.0	10.1	10.2	0.9	9.9	0.0	0.5	0.0	0.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.1	10.2	0.9	9.9	0.0	0.5	0.0	0.1	0.0	0.0	0.0
Prop In Lane	1.00		0.22	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	3	399	402	45	1252	0	928	0	761	120	896	0
V/C Ratio(X)	0.00	0.78	0.78	0.60	0.58	0.00	0.03	0.00	0.01	0.00	0.00	0.00
Avail Cap(c_a), veh/h	200	602	606	200	1252	0	928	0	761	120	896	0
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.66	0.66	0.83	0.83	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	26.4	26.4	28.9	16.0	0.0	8.5	0.0	8.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.1	1.2	3.9	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.2	5.3	0.5	4.9	0.0	0.2	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	27.5	27.6	32.9	16.4	0.0	8.6	0.0	8.4	0.0	0.0	0.0
LnGrp LOS		C	C	C	B		A		A			
Approach Vol, veh/h		625			757			30			0	
Approach Delay, s/veh		27.6			17.0			8.5			0.0	
Approach LOS		C			B			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		33.2	7.6	19.2		33.2	0.0	26.8
Change Period (Y+Rc), s		4.9	6.0	* 6		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	7.0	* 20		18.1	7.0	20.0
Max Q Clear Time (g_c+I1), s		2.5	2.9	12.2		0.0	0.0	11.9
Green Ext Time (p_c), s		0.0	0.0	1.0		0.0	0.0	1.5

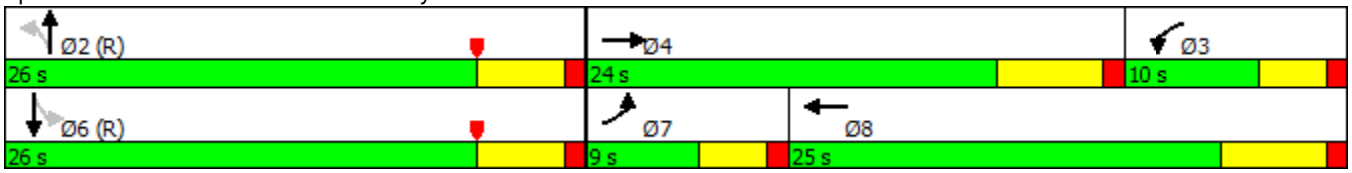
Intersection Summary	
HCM 2010 Ctrl Delay	21.5
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	422	40	656	47	0	66	1
Future Volume (vph)	38	422	40	656	47	0	66	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	24.0	10.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	40.0%	16.7%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	5.6	14.8	6.9	16.2	29.1	29.1	29.1	29.1
Actuated g/C Ratio	0.09	0.25	0.12	0.27	0.48	0.48	0.48	0.48
v/c Ratio	0.27	0.61	0.22	0.77	0.08	0.03	0.11	0.01
Control Delay	9.7	9.9	25.3	26.7	12.4	0.1	12.6	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	9.9	25.3	26.7	12.4	0.1	12.6	8.4
LOS	A	A	C	C	B	A	B	A
Approach Delay		9.9		26.6		7.9		12.1
Approach LOS		A		C		A		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 47 (78%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	422	70	40	656	20	47	0	27	66	1	8
Future Volume (veh/h)	38	422	70	40	656	20	47	0	27	66	1	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	42	469	71	44	729	22	52	0	20	73	1	8
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	72	580	87	127	878	26	786	0	758	774	86	685
Arrive On Green	0.08	0.37	0.37	0.07	0.25	0.25	0.47	0.00	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1714	3137	472	1714	3578	108	1428	0	1615	1414	182	1460
Grp Volume(v), veh/h	42	269	271	44	368	383	52	0	20	73	0	9
Grp Sat Flow(s),veh/h/ln	1714	1805	1804	1714	1805	1881	1428	0	1615	1414	0	1642
Q Serve(g_s), s	1.4	8.0	8.1	1.5	11.6	11.6	1.2	0.0	0.4	1.8	0.0	0.2
Cycle Q Clear(g_c), s	1.4	8.0	8.1	1.5	11.6	11.6	1.4	0.0	0.4	2.2	0.0	0.2
Prop In Lane	1.00		0.26	1.00		0.06	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	72	334	333	127	443	461	786	0	758	774	0	771
V/C Ratio(X)	0.58	0.81	0.81	0.35	0.83	0.83	0.07	0.00	0.03	0.09	0.00	0.01
Avail Cap(c_a), veh/h	143	551	550	171	581	605	786	0	758	774	0	771
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.68	0.55	0.55	0.55	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.0	17.9	18.0	26.4	21.5	21.5	8.9	0.0	8.6	9.1	0.0	8.5
Incr Delay (d2), s/veh	1.9	1.2	1.3	0.3	3.4	3.3	0.2	0.0	0.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.0	4.0	0.7	6.1	6.4	0.5	0.0	0.2	0.7	0.0	0.1
LnGrp Delay(d),s/veh	28.9	19.2	19.3	26.7	24.9	24.8	9.0	0.0	8.6	9.4	0.0	8.5
LnGrp LOS	C	B	B	C	C	C	A		A	A		A
Approach Vol, veh/h		582			795			72			82	
Approach Delay, s/veh		19.9			24.9			8.9			9.3	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		33.1	10.1	16.8		33.1	6.5	20.4
Change Period (Y+Rc), s		4.9	5.7	* 5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	6.0	* 18		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		3.4	3.5	10.1		4.2	3.4	13.6
Green Ext Time (p_c), s		0.1	0.6	0.9		0.1	0.0	1.1

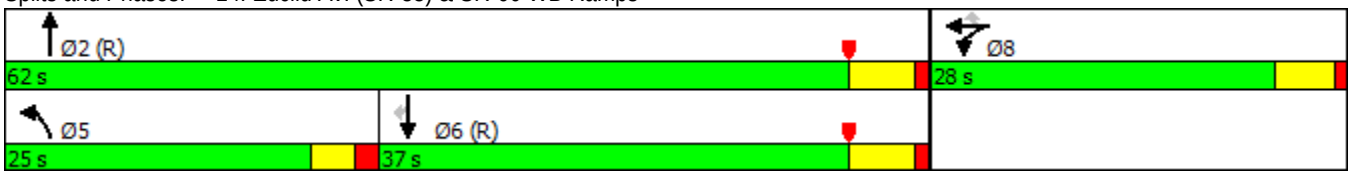
Intersection Summary	
HCM 2010 Ctrl Delay	21.4
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	616	2	401	532	1469	1429	796
Future Volume (vph)	616	2	401	532	1469	1429	796
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	22.3	22.3	22.3	21.2	57.2	31.5	31.5
Actuated g/C Ratio	0.25	0.25	0.25	0.24	0.64	0.35	0.35
v/c Ratio	0.94	0.91	0.78	1.42	0.69	1.22	0.93
Control Delay	66.4	59.9	37.0	215.8	27.1	133.6	27.4
Queue Delay	0.0	0.0	0.0	0.0	48.8	0.2	0.0
Total Delay	66.4	59.9	37.0	215.8	75.9	133.8	27.4
LOS	E	E	D	F	E	F	C
Approach Delay		54.9			113.1	95.8	
Approach LOS		D			F	F	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.42	
Intersection Signal Delay: 94.4	Intersection LOS: F
Intersection Capacity Utilization 115.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	616	2	401	532	1469	0	0	1429	796
Future Volume (veh/h)	0	0	0	616	2	401	532	1469	0	0	1429	796
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1800	1900	1900	1800	1900	0	0	1900	1900
Adj Flow Rate, veh/h				749	0	185	572	1580	0	0	1537	856
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				824	0	388	390	2321	0	0	1318	568
Arrive On Green				0.24	0.00	0.24	0.46	1.00	0.00	0.00	0.37	0.37
Sat Flow, veh/h				3429	0	1615	1714	3705	0	0	3705	1556
Grp Volume(v), veh/h				749	0	185	572	1580	0	0	1537	856
Grp Sat Flow(s),veh/h/ln				1714	0	1615	1714	1805	0	0	1805	1556
Q Serve(g_s), s				19.1	0.0	8.8	20.5	0.0	0.0	0.0	32.9	32.9
Cycle Q Clear(g_c), s				19.1	0.0	8.8	20.5	0.0	0.0	0.0	32.9	32.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				824	0	388	390	2321	0	0	1318	568
V/C Ratio(X)				0.91	0.00	0.48	1.46	0.68	0.00	0.00	1.17	1.51
Avail Cap(c_a), veh/h				876	0	413	390	2321	0	0	1318	568
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.2	0.0	29.3	24.5	0.0	0.0	0.0	28.6	28.6
Incr Delay (d2), s/veh				12.3	0.0	0.3	210.5	0.1	0.0	0.0	83.2	237.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.5	0.0	4.0	32.4	0.0	0.0	0.0	31.5	51.5
LnGrp Delay(d),s/veh				45.5	0.0	29.7	235.0	0.1	0.0	0.0	111.8	265.7
LnGrp LOS				D		C	F	A			F	F
Approach Vol, veh/h					934			2152			2393	
Approach Delay, s/veh					42.4			62.6			166.8	
Approach LOS					D			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		63.4			25.0	38.4		26.6
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			22.5	34.9		21.1
Green Ext Time (p_c), s		52.9			0.0	0.0		0.5

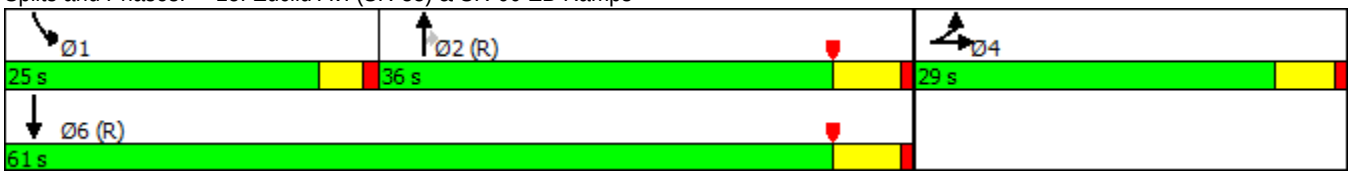
Intersection Summary	
HCM 2010 Ctrl Delay	104.7
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	423	0	1578	767	313	1732
Future Volume (vph)	423	0	1578	767	313	1732
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	31.9	31.9	19.6	55.5
Actuated g/C Ratio	0.27	0.27	0.35	0.35	0.22	0.62
v/c Ratio	0.94	0.99	1.31	0.86	0.89	0.83
Control Delay	63.9	69.4	174.9	17.8	42.9	4.7
Queue Delay	133.8	67.9	0.4	0.0	0.0	25.3
Total Delay	197.8	137.2	175.3	17.8	42.9	30.0
LOS	F	F	F	B	D	C
Approach Delay		165.3	123.8			32.0
Approach LOS		F	F			C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 94.3	Intersection LOS: F
Intersection Capacity Utilization 115.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	423	0	398	0	0	0	0	1578	767	313	1732	0
Future Volume (veh/h)	423	0	398	0	0	0	0	1578	767	313	1732	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900				0	1900	1900	1800	1900	0
Adj Flow Rate, veh/h	395	77	340				0	1679	816	333	1843	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	457	82	361				0	1301	579	363	2226	0
Arrive On Green	0.27	0.27	0.27				0.00	0.36	0.36	0.28	0.82	0.00
Sat Flow, veh/h	1714	307	1354				0	3705	1606	1714	3705	0
Grp Volume(v), veh/h	395	0	417				0	1679	816	333	1843	0
Grp Sat Flow(s),veh/h/ln	1714	0	1661				0	1805	1606	1714	1805	0
Q Serve(g_s), s	19.8	0.0	22.1				0.0	32.4	32.4	16.9	25.7	0.0
Cycle Q Clear(g_c), s	19.8	0.0	22.1				0.0	32.4	32.4	16.9	25.7	0.0
Prop In Lane	1.00		0.82				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	457	0	443				0	1301	579	363	2226	0
V/C Ratio(X)	0.86	0.00	0.94				0.00	1.29	1.41	0.92	0.83	0.00
Avail Cap(c_a), veh/h	457	0	443				0	1301	579	400	2226	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.09	0.09	0.09	0.09	0.00
Uniform Delay (d), s/veh	31.4	0.0	32.3				0.0	28.8	28.8	31.6	5.4	0.0
Incr Delay (d2), s/veh	15.1	0.0	28.2				0.0	131.1	185.2	3.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	0.0	13.5				0.0	39.8	44.1	8.3	12.3	0.0
LnGrp Delay(d),s/veh	46.5	0.0	60.5				0.0	159.9	214.0	34.7	5.8	0.0
LnGrp LOS	D		E					F	F	C	A	
Approach Vol, veh/h		812						2495			2176	
Approach Delay, s/veh		53.7						177.6			10.2	
Approach LOS		D						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.1	37.9		29.0		61.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	18.9	34.4		24.1		27.7		
Green Ext Time (p_c), s	0.1	0.0		0.0		27.5		

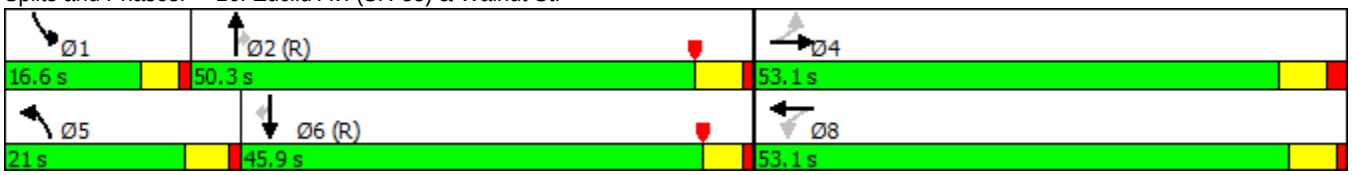
Intersection Summary	
HCM 2010 Ctrl Delay	92.8
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	297	442	113	409	147	1818	69	209	1710	76
Future Volume (vph)	297	442	113	409	147	1818	69	209	1710	76
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	46.8	46.8	47.8	47.8	14.5	46.0	46.0	11.1	43.0	43.0
Actuated g/C Ratio	0.39	0.39	0.40	0.40	0.12	0.38	0.38	0.09	0.36	0.36
v/c Ratio	1.53	0.47	0.53	0.47	0.75	0.96	0.11	0.72	0.97	0.13
Control Delay	289.5	26.1	38.3	23.5	35.4	35.5	9.3	66.2	52.9	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	289.5	26.1	38.3	23.5	35.4	35.5	9.3	66.2	52.9	8.2
LOS	F	C	D	C	D	D	A	E	D	A
Approach Delay		111.6		25.7		34.6			52.6	
Approach LOS		F		C		C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.53	
Intersection Signal Delay: 52.1	Intersection LOS: D
Intersection Capacity Utilization 95.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	442	177	113	409	228	147	1818	69	209	1710	76
Future Volume (veh/h)	297	442	177	113	409	228	147	1818	69	209	1710	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	313	465	164	119	431	207	155	1914	54	220	1800	51
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	262	1023	358	268	921	438	183	2041	635	274	1896	590
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.04	0.13	0.13	0.08	0.37	0.37
Sat Flow, veh/h	802	2624	918	810	2362	1123	1714	5187	1615	3326	5187	1612
Grp Volume(v), veh/h	313	319	310	119	328	310	155	1914	54	220	1800	51
Grp Sat Flow(s),veh/h/ln	802	1805	1737	810	1805	1680	1714	1729	1615	1663	1729	1612
Q Serve(g_s), s	30.3	15.7	15.9	15.4	16.3	16.5	10.8	43.9	3.5	7.8	40.5	2.5
Cycle Q Clear(g_c), s	46.8	15.7	15.9	31.3	16.3	16.5	10.8	43.9	3.5	7.8	40.5	2.5
Prop In Lane	1.00		0.53	1.00		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	704	677	268	704	655	183	2041	635	274	1896	590
V/C Ratio(X)	1.19	0.45	0.46	0.44	0.47	0.47	0.85	0.94	0.08	0.80	0.95	0.09
Avail Cap(c_a), veh/h	262	704	677	275	719	669	230	2041	635	335	1896	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.45	0.45	0.45
Uniform Delay (d), s/veh	48.3	27.1	27.2	38.8	27.3	27.4	56.9	50.8	33.2	54.1	37.0	24.9
Incr Delay (d2), s/veh	118.2	0.5	0.5	1.1	0.5	0.5	2.3	1.2	0.0	4.2	6.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.3	7.9	7.7	3.5	8.2	7.8	5.2	21.3	1.6	3.7	20.4	1.1
LnGrp Delay(d),s/veh	166.5	27.6	27.7	39.9	27.8	27.9	59.2	51.9	33.2	58.3	43.3	25.1
LnGrp LOS	F	C	C	D	C	C	E	D	C	E	D	C
Approach Vol, veh/h		942			757			2123			2071	
Approach Delay, s/veh		73.8			29.7			52.0			44.4	
Approach LOS		E			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.4	52.5		53.1	17.7	49.2		53.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	9.8	45.9		48.8	12.8	42.5		33.3
Green Ext Time (p_c), s	0.1	0.0		0.0	0.1	0.0		8.6

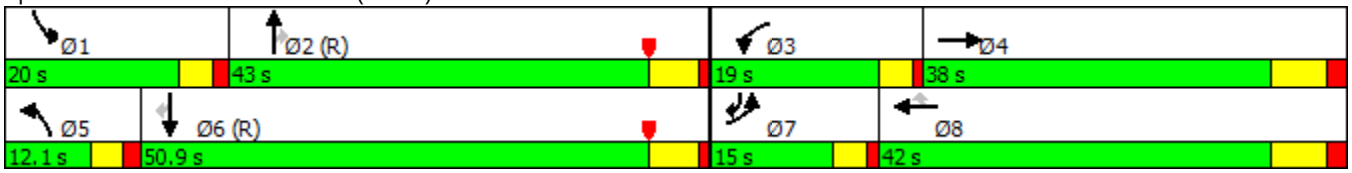
Intersection Summary			
HCM 2010 Ctrl Delay		49.9	
HCM 2010 LOS		D	

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	189	501	268	507	67	152	1570	336	238	1753	196
Future Volume (vph)	189	501	268	507	67	152	1570	336	238	1753	196
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	15.0	38.0	19.0	42.0	42.0	12.1	43.0	43.0	20.0	50.9	15.0
Total Split (%)	12.5%	31.7%	15.8%	35.0%	35.0%	10.1%	35.8%	35.8%	16.7%	42.4%	12.5%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.0	29.2	15.0	33.2	33.2	9.4	37.5	37.5	17.3	45.4	61.9
Actuated g/C Ratio	0.09	0.24	0.12	0.28	0.28	0.08	0.31	0.31	0.14	0.38	0.52
v/c Ratio	1.28	0.83	1.32	0.53	0.13	1.20	1.47	0.55	1.02	1.35	0.24
Control Delay	208.1	49.5	215.7	38.8	0.5	154.6	236.2	7.4	121.7	180.7	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	208.1	49.5	215.7	38.8	0.5	154.6	236.2	7.4	121.7	180.7	0.9
LOS	F	D	F	D	A	F	F	A	F	F	A
Approach Delay		83.5		91.9			192.8			158.2	
Approach LOS		F		F			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.47	
Intersection Signal Delay: 149.8	Intersection LOS: F
Intersection Capacity Utilization 110.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	501	191	268	507	67	152	1570	336	238	1753	196
Future Volume (veh/h)	189	501	191	268	507	67	152	1570	336	238	1753	196
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	199	527	178	282	534	66	160	1653	273	251	1845	140
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	157	642	216	214	997	446	109	1184	530	221	1422	784
Arrive On Green	0.09	0.24	0.24	0.13	0.28	0.28	0.08	0.44	0.44	0.17	0.52	0.52
Sat Flow, veh/h	1714	2644	889	1714	3610	1613	1714	3610	1615	1714	3610	1615
Grp Volume(v), veh/h	199	359	346	282	534	66	160	1653	273	251	1845	140
Grp Sat Flow(s),veh/h/ln	1714	1805	1728	1714	1805	1613	1714	1805	1615	1714	1805	1615
Q Serve(g_s), s	11.0	22.6	22.7	15.0	15.1	3.7	7.6	39.4	14.8	15.5	47.3	4.8
Cycle Q Clear(g_c), s	11.0	22.6	22.7	15.0	15.1	3.7	7.6	39.4	14.8	15.5	47.3	4.8
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	438	420	214	997	446	109	1184	530	221	1422	784
V/C Ratio(X)	1.27	0.82	0.82	1.32	0.54	0.15	1.47	1.40	0.52	1.13	1.30	0.18
Avail Cap(c_a), veh/h	157	466	446	214	1053	471	109	1184	530	221	1422	784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.23	0.23	0.23
Uniform Delay (d), s/veh	54.5	42.9	43.0	52.5	36.9	32.8	54.9	33.8	26.9	49.7	28.6	13.4
Incr Delay (d2), s/veh	160.5	11.1	12.0	171.2	0.7	0.2	217.7	178.8	0.3	73.0	135.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	12.6	12.3	17.3	7.6	1.7	10.1	48.9	6.6	11.8	49.9	2.1
LnGrp Delay(d),s/veh	215.0	54.1	55.0	223.7	37.5	33.0	272.6	212.6	27.2	122.6	163.9	13.6
LnGrp LOS	F	D	E	F	D	C	F	F	C	F	F	B
Approach Vol, veh/h		904			882			2086			2236	
Approach Delay, s/veh		89.9			96.7			193.0			149.8	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	44.9	19.0	36.1	12.1	52.8	15.0	40.1
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	37.5	15.0	31.0	7.6	45.4	11.0	35.0
Max Q Clear Time (g_c+I1), s	17.5	41.4	17.0	24.7	9.6	49.3	13.0	17.1
Green Ext Time (p_c), s	0.0	0.0	0.0	4.4	0.0	0.0	0.0	9.8

Intersection Summary	
HCM 2010 Ctrl Delay	148.0
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	212	233	82	147	211	87	1761	208	58	2061	128
Future Volume (vph)	212	233	82	147	211	87	1761	208	58	2061	128
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	37.0	37.0	37.0		37.0	10.2	61.2	61.2	7.0	56.3	56.3
Actuated g/C Ratio	0.31	0.31	0.31		0.31	0.08	0.51	0.51	0.06	0.47	0.47
v/c Ratio	1.03	0.42	0.16		1.26	0.63	1.01	0.26	0.62	1.28	0.17
Control Delay	110.3	35.7	6.3		171.2	70.7	47.0	5.9	41.9	168.8	19.9
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.3	35.7	6.3		171.2	70.7	47.0	5.9	41.9	168.8	19.9
LOS	F	D	A		F	E	D	A	D	F	B
Approach Delay		61.1			171.2		43.8			157.0	
Approach LOS		E			F		D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 104.8	Intersection LOS: F
Intersection Capacity Utilization 120.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	233	82	147	211	107	87	1761	208	58	2061	128
Future Volume (veh/h)	212	233	82	147	211	107	87	1761	208	58	2061	128
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	223	245	62	155	222	109	92	1854	183	61	2169	106
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	240	586	492	140	159	75	113	1838	822	77	1763	788
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.13	1.00	1.00	0.05	0.49	0.49
Sat Flow, veh/h	1066	1900	1594	324	515	243	1714	3610	1615	1714	3610	1613
Grp Volume(v), veh/h	223	245	62	486	0	0	92	1854	183	61	2169	106
Grp Sat Flow(s),veh/h/ln	1066	1900	1594	1082	0	0	1714	1805	1615	1714	1805	1613
Q Serve(g_s), s	0.0	12.3	3.4	24.7	0.0	0.0	6.3	61.1	0.0	4.2	58.6	4.3
Cycle Q Clear(g_c), s	37.0	12.3	3.4	37.0	0.0	0.0	6.3	61.1	0.0	4.2	58.6	4.3
Prop In Lane	1.00		1.00	0.32		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	586	492	373	0	0	113	1838	822	77	1763	788
V/C Ratio(X)	0.93	0.42	0.13	1.30	0.00	0.00	0.81	1.01	0.22	0.79	1.23	0.13
Avail Cap(c_a), veh/h	240	586	492	373	0	0	179	1838	822	107	1763	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.42	0.42	0.42	0.09	0.09	0.09
Uniform Delay (d), s/veh	45.0	33.0	29.9	47.7	0.0	0.0	51.4	0.0	0.0	56.7	30.7	16.8
Incr Delay (d2), s/veh	38.7	0.5	0.1	154.6	0.0	0.0	3.1	15.9	0.3	1.6	104.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	6.5	1.5	28.3	0.0	0.0	3.1	4.1	0.1	2.0	54.6	1.9
LnGrp Delay(d),s/veh	83.8	33.4	30.0	202.2	0.0	0.0	54.5	15.9	0.3	58.3	134.9	16.8
LnGrp LOS	F	C	C	F			D	F	A	E	F	B
Approach Vol, veh/h		530			486			2129			2336	
Approach Delay, s/veh		54.2			202.2			16.2			127.6	
Approach LOS		D			F			B			F	

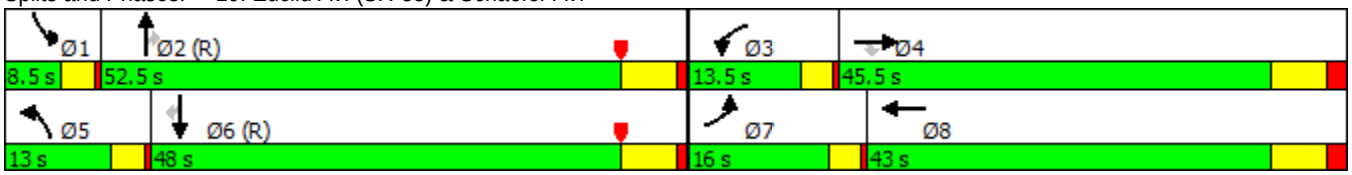
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.9	67.1		44.0	11.4	64.6		44.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	6.2	63.1		39.0	8.3	60.6		39.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	83.8
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	181	79	148	72	155	148	1400	26	40	2180	227
Future Volume (vph)	181	79	148	72	155	148	1400	26	40	2180	227
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.5	26.8	26.8	10.0	21.6	17.8	61.0	61.0	6.6	48.1	48.1
Actuated g/C Ratio	0.10	0.22	0.22	0.08	0.18	0.15	0.51	0.51	0.06	0.40	0.40
v/c Ratio	1.08	0.20	0.33	0.54	0.71	0.62	0.81	0.03	0.46	1.60	0.34
Control Delay	142.0	38.0	6.8	67.6	52.5	46.9	27.3	0.0	60.1	298.5	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.0	38.0	6.8	67.6	52.5	46.9	27.3	0.0	60.1	298.5	11.1
LOS	F	D	A	E	D	D	C	A	E	F	B
Approach Delay		73.0			56.2		28.7			267.9	
Approach LOS		E			E		C			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.60	
Intersection Signal Delay: 158.1	Intersection LOS: F
Intersection Capacity Utilization 109.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	79	148	72	155	72	148	1400	26	40	2180	227
Future Volume (veh/h)	181	79	148	72	155	72	148	1400	26	40	2180	227
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	193	84	105	77	165	75	157	1489	23	43	2319	193
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	353	300	132	196	89	136	1945	870	54	1774	775
Arrive On Green	0.10	0.19	0.19	0.08	0.16	0.16	0.03	0.18	0.18	0.01	0.16	0.16
Sat Flow, veh/h	1714	1900	1615	1714	1238	563	1714	3610	1615	1714	3610	1577
Grp Volume(v), veh/h	193	84	105	77	0	240	157	1489	23	43	2319	193
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	0	1801	1714	1805	1615	1714	1805	1577
Q Serve(g_s), s	12.5	4.5	6.8	5.2	0.0	15.5	9.5	47.1	1.4	3.0	59.0	12.8
Cycle Q Clear(g_c), s	12.5	4.5	6.8	5.2	0.0	15.5	9.5	47.1	1.4	3.0	59.0	12.8
Prop In Lane	1.00		1.00	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	353	300	132	0	286	136	1945	870	54	1774	775
V/C Ratio(X)	1.08	0.24	0.35	0.58	0.00	0.84	1.16	0.77	0.03	0.79	1.31	0.25
Avail Cap(c_a), veh/h	179	610	518	143	0	540	136	1945	870	71	1774	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.8	41.6	42.5	53.5	0.0	49.0	58.4	42.1	23.3	59.0	50.3	30.9
Incr Delay (d2), s/veh	90.5	0.3	0.5	2.9	0.0	5.0	78.5	0.3	0.0	2.9	138.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	2.4	3.1	2.6	0.0	8.1	7.5	23.7	0.6	1.5	63.7	5.6
LnGrp Delay(d),s/veh	144.3	41.9	43.1	56.4	0.0	54.0	136.9	42.4	23.3	61.9	188.9	31.0
LnGrp LOS	F	D	D	E		D	F	D	C	E	F	C
Approach Vol, veh/h		382			317			1669			2555	
Approach Delay, s/veh		93.9			54.6			51.0			174.8	
Approach LOS		F			D			D			F	

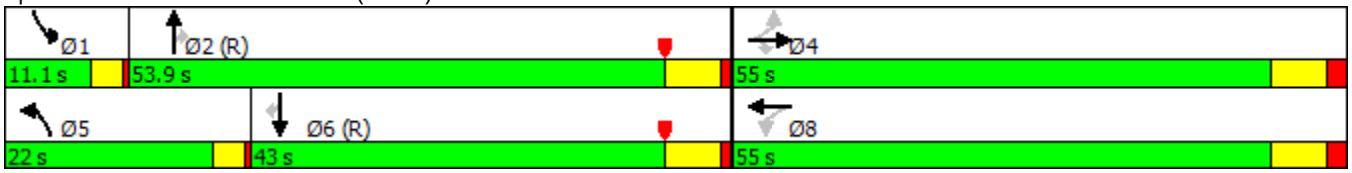
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	70.7	12.7	29.3	13.0	65.0	16.0	26.0
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	5.0	49.1	7.2	8.8	11.5	61.0	14.5	17.5
Green Ext Time (p_c), s	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	118.8
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	401	579	267	268	655	303	1146	80	363	1861	322
Future Volume (vph)	401	579	267	268	655	303	1146	80	363	1861	322
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	48.0	48.0	48.0	48.0	48.0	18.5	47.9	47.9	7.6	37.0	37.0
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.15	0.40	0.40	0.06	0.31	0.31
v/c Ratio	7.24	0.81	0.36	2.52	1.48	1.22	0.85	0.12	3.57	1.78	0.62
Control Delay	2849.6	41.9	5.5	730.4	254.4	167.3	43.4	10.3	1179.0	369.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2849.6	41.9	5.5	730.4	254.4	167.3	43.4	10.3	1179.0	369.8	2.4
LOS	F	D	A	F	F	F	D	B	F	F	A
Approach Delay		937.6			353.3		66.2			438.6	
Approach LOS		F			F		E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 7.24	
Intersection Signal Delay: 430.0	Intersection LOS: F
Intersection Capacity Utilization 169.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	579	267	268	655	367	303	1146	80	363	1861	322
Future Volume (veh/h)	401	579	267	268	655	367	303	1146	80	363	1861	322
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	427	616	217	285	697	388	322	1219	70	386	1980	312
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	60	760	646	135	459	256	264	1441	645	109	1113	497
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.31	0.80	0.80	0.08	0.41	0.41
Sat Flow, veh/h	528	1900	1615	669	1148	639	1714	3610	1615	1714	3610	1612
Grp Volume(v), veh/h	427	616	217	285	0	1085	322	1219	70	386	1980	312
Grp Sat Flow(s),veh/h/ln	528	1900	1615	669	0	1787	1714	1805	1615	1714	1805	1612
Q Serve(g_s), s	0.0	34.5	11.2	13.5	0.0	48.0	18.5	25.2	1.1	7.6	37.0	18.4
Cycle Q Clear(g_c), s	48.0	34.5	11.2	48.0	0.0	48.0	18.5	25.2	1.1	7.6	37.0	18.4
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	760	646	135	0	715	264	1441	645	109	1113	497
V/C Ratio(X)	7.12	0.81	0.34	2.11	0.00	1.52	1.22	0.85	0.11	3.56	1.78	0.63
Avail Cap(c_a), veh/h	60	760	646	135	0	715	264	1441	645	109	1113	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.89	0.89	0.89	0.09	0.09	0.09
Uniform Delay (d), s/veh	60.0	32.0	25.0	56.3	0.0	36.0	41.5	9.8	7.4	54.9	35.4	29.9
Incr Delay (d2), s/veh	2787.0	6.6	0.3	523.6	0.0	240.3	124.9	5.7	0.3	1151.9	350.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	48.4	19.5	5.1	24.1	0.0	71.3	17.8	13.0	0.6	38.3	72.6	8.3
LnGrp Delay(d),s/veh	2847.0	38.6	25.3	579.9	0.0	276.3	166.4	15.5	7.7	1206.9	386.2	30.5
LnGrp LOS	F	D	C	F		F	F	B	A	F	F	C
Approach Vol, veh/h		1260			1370			1611			2678	
Approach Delay, s/veh		988.0			339.5			45.3			463.1	
Approach LOS		F			F			D			F	

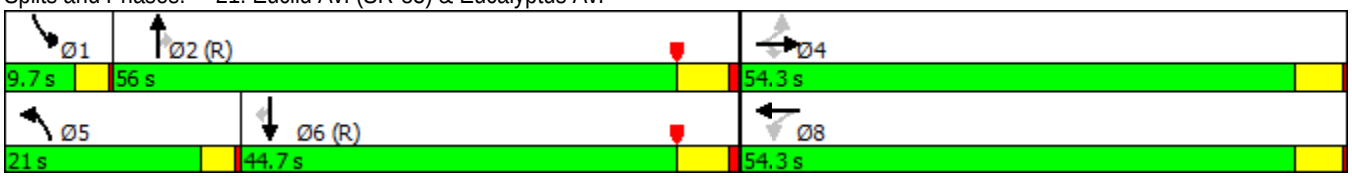
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.1	53.9		55.0	22.0	43.0		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	9.6	27.2		50.0	20.5	39.0		50.0
Green Ext Time (p_c), s	0.0	19.1		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		436.9
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	71	10	244	71	58	216	1074	30	41	1992	88
Future Volume (vph)	71	10	244	71	58	216	1074	30	41	1992	88
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	54.3	54.3	54.3	54.3	54.3	21.0	56.0	56.0	9.7	44.7	44.7
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	17.5%	46.7%	46.7%	8.1%	37.3%	37.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	17.0	17.0	17.0	17.0	17.0	21.6	82.8	82.8	8.0	67.4	67.4
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.18	0.69	0.69	0.07	0.56	0.56
v/c Ratio	0.49	0.04	0.57	0.39	0.39	0.73	0.45	0.03	0.38	1.02	0.10
Control Delay	54.4	36.5	9.4	48.6	28.8	60.9	7.8	1.0	68.0	33.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	36.5	9.4	48.6	28.8	60.9	7.8	1.0	68.0	33.4	2.8
LOS	D	D	A	D	C	E	A	A	E	C	A
Approach Delay		20.0			36.6		16.3			32.8	
Approach LOS		C			D		B			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 26.4	Intersection LOS: C
Intersection Capacity Utilization 90.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	10	244	71	58	52	216	1074	30	41	1992	88
Future Volume (veh/h)	71	10	244	71	58	52	216	1074	30	41	1992	88
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	74	10	168	74	60	47	225	1119	31	43	2075	88
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	167	262	223	223	136	107	250	2577	1153	54	2165	947
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.71	0.71	0.01	0.20	0.20
Sat Flow, veh/h	1307	1900	1615	1225	989	775	1714	3610	1615	1714	3610	1579
Grp Volume(v), veh/h	74	10	168	74	0	107	225	1119	31	43	2075	88
Grp Sat Flow(s),veh/h/ln	1307	1900	1615	1225	0	1763	1714	1805	1615	1714	1805	1579
Q Serve(g_s), s	6.6	0.5	12.0	6.7	0.0	6.7	15.5	15.4	0.7	3.0	68.3	5.5
Cycle Q Clear(g_c), s	13.3	0.5	12.0	7.2	0.0	6.7	15.5	15.4	0.7	3.0	68.3	5.5
Prop In Lane	1.00		1.00	1.00		0.44	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	167	262	223	223	0	243	250	2577	1153	54	2165	947
V/C Ratio(X)	0.44	0.04	0.75	0.33	0.00	0.44	0.90	0.43	0.03	0.79	0.96	0.09
Avail Cap(c_a), veh/h	526	784	666	560	0	727	250	2577	1153	89	2165	947
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.6	44.8	49.8	48.0	0.0	47.5	50.4	7.1	5.0	59.0	46.6	21.4
Incr Delay (d2), s/veh	1.4	0.0	3.9	0.6	0.0	0.9	31.8	0.5	0.0	1.8	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.3	5.6	2.3	0.0	3.3	9.5	7.8	0.3	1.5	34.7	2.4
LnGrp Delay(d),s/veh	54.9	44.9	53.6	48.6	0.0	48.4	82.3	7.7	5.1	60.7	48.2	21.5
LnGrp LOS	D	D	D	D		D	F	A	A	E	D	C
Approach Vol, veh/h		252			181			1375			2206	
Approach Delay, s/veh		53.7			48.5			19.8			47.4	
Approach LOS		D			D			B			D	

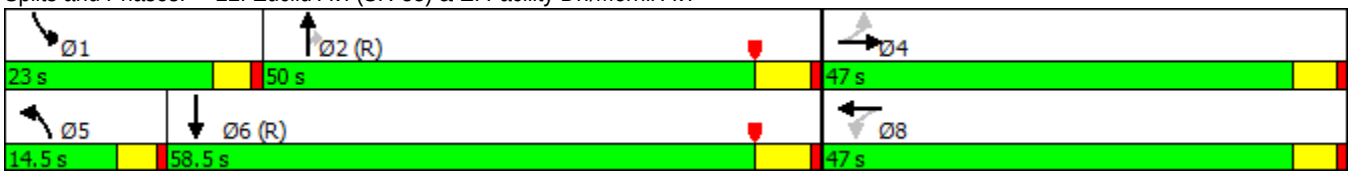
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.3	91.3		21.3	21.0	77.7		21.3
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	50.3		49.5	17.5	39.0		49.5
Max Q Clear Time (g_c+I1), s	5.0	17.4		15.3	17.5	70.3		9.2
Green Ext Time (p_c), s	0.0	28.5		1.2	0.0	0.0		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	38.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	10	8	231	62	25	1093	159	473	2037
Future Volume (vph)	10	8	231	62	25	1093	159	473	2037
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	50.0	50.0	23.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	41.7%	41.7%	19.2%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		42.0		42.0	10.0	44.0	44.0	18.5	58.3
Actuated g/C Ratio		0.35		0.35	0.08	0.37	0.37	0.15	0.49
v/c Ratio		0.05		1.35	0.18	0.86	0.25	1.87	1.25
Control Delay		22.1		199.0	65.2	32.0	6.0	430.3	139.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.1		199.0	65.2	32.0	6.0	430.3	139.2
LOS		C		F	E	C	A	F	F
Approach Delay		22.1		199.0		29.4			192.9
Approach LOS		C		F		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.87	
Intersection Signal Delay: 147.9	Intersection LOS: F
Intersection Capacity Utilization 130.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	8	5	231	62	465	25	1093	159	473	2037	56
Future Volume (veh/h)	10	8	5	231	62	465	25	1093	159	473	2037	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	10	8	4	241	65	438	26	1139	140	493	2122	55
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	191	148	66	220	49	328	83	1324	592	264	1699	44
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.05	0.37	0.37	0.15	0.47	0.47
Sat Flow, veh/h	422	424	188	515	139	937	1714	3610	1615	1714	3596	93
Grp Volume(v), veh/h	22	0	0	744	0	0	26	1139	140	493	1061	1116
Grp Sat Flow(s),veh/h/ln	1034	0	0	1591	0	0	1714	1805	1615	1714	1805	1884
Q Serve(g_s), s	0.0	0.0	0.0	41.1	0.0	0.0	1.8	35.0	7.2	18.5	56.7	56.7
Cycle Q Clear(g_c), s	0.9	0.0	0.0	42.0	0.0	0.0	1.8	35.0	7.2	18.5	56.7	56.7
Prop In Lane	0.45		0.18	0.32		0.59	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	405	0	0	597	0	0	83	1324	592	264	853	890
V/C Ratio(X)	0.05	0.00	0.00	1.25	0.00	0.00	0.31	0.86	0.24	1.87	1.24	1.25
Avail Cap(c_a), veh/h	405	0	0	597	0	0	143	1324	592	264	853	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.67	0.67	0.67	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	0.0	40.3	0.0	0.0	55.2	35.2	26.4	50.8	31.6	31.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	124.7	0.0	0.0	0.5	5.2	0.6	403.6	119.5	123.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	40.4	0.0	0.0	0.9	18.4	3.3	38.4	56.5	60.0
LnGrp Delay(d),s/veh	25.7	0.0	0.0	165.0	0.0	0.0	55.7	40.4	27.0	454.3	151.1	155.3
LnGrp LOS	C			F			E	D	C	F	F	F
Approach Vol, veh/h		22			744			1305			2670	
Approach Delay, s/veh		25.7			165.0			39.2			208.9	
Approach LOS		C			F			D			F	

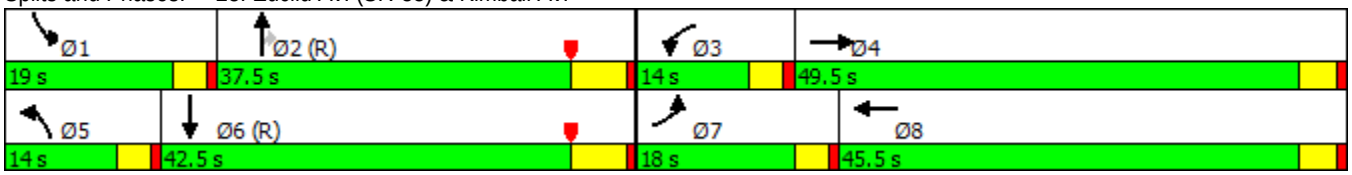
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	50.0		47.0	10.3	62.7		47.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	18.5	44.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	20.5	37.0		2.9	3.8	58.7		44.0
Green Ext Time (p_c), s	0.0	6.7		3.5	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		154.4
HCM 2010 LOS		F

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	131	239	259	336	124	746	152	260	1466
Future Volume (vph)	131	239	259	336	124	746	152	260	1466
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	14.0	37.5	37.5	19.0	42.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	11.7%	31.3%	31.3%	15.8%	35.4%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	12.7	26.0	10.0	23.3	13.0	37.6	37.6	27.9	52.5
Actuated g/C Ratio	0.11	0.22	0.08	0.19	0.11	0.31	0.31	0.23	0.44
v/c Ratio	0.74	0.47	1.86	0.74	0.69	0.67	0.25	0.67	1.10
Control Delay	75.8	27.2	443.2	38.6	49.8	45.9	18.8	64.9	70.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.8	27.2	443.2	38.6	49.8	45.9	18.8	64.9	70.7
LOS	E	C	F	D	D	D	B	E	E
Approach Delay		39.5		166.2		42.3			69.9
Approach LOS		D		F		D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.86	
Intersection Signal Delay: 78.0	Intersection LOS: E
Intersection Capacity Utilization 97.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	239	150	259	336	225	124	746	152	260	1466	212
Future Volume (veh/h)	131	239	150	259	336	225	124	746	152	260	1466	212
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	134	244	151	264	343	208	127	761	147	265	1496	178
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	159	461	276	143	441	263	143	1536	687	214	1518	179
Arrive On Green	0.09	0.21	0.21	0.08	0.20	0.20	0.03	0.14	0.14	0.13	0.47	0.47
Sat Flow, veh/h	1714	2176	1299	1714	2179	1297	1714	3610	1615	1714	3249	382
Grp Volume(v), veh/h	134	201	194	264	283	268	127	761	147	265	824	850
Grp Sat Flow(s),veh/h/ln	1714	1805	1671	1714	1805	1671	1714	1805	1615	1714	1805	1827
Q Serve(g_s), s	9.2	11.8	12.4	10.0	17.8	18.3	8.9	23.4	9.7	15.0	53.7	55.7
Cycle Q Clear(g_c), s	9.2	11.8	12.4	10.0	17.8	18.3	8.9	23.4	9.7	15.0	53.7	55.7
Prop In Lane	1.00		0.78	1.00		0.78	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	159	383	354	143	366	338	143	1536	687	214	843	853
V/C Ratio(X)	0.84	0.52	0.55	1.85	0.77	0.79	0.89	0.50	0.21	1.24	0.98	1.00
Avail Cap(c_a), veh/h	200	677	627	143	617	571	143	1536	687	214	843	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	0.88	0.88	0.88	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.6	41.9	42.2	55.0	45.3	45.4	57.8	39.7	33.8	52.5	31.3	31.9
Incr Delay (d2), s/veh	17.5	1.0	1.2	407.3	1.3	1.6	39.4	1.0	0.6	110.3	5.3	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	6.0	5.8	20.9	9.0	8.6	5.8	11.9	4.5	13.6	27.8	29.9
LnGrp Delay(d),s/veh	71.1	42.9	43.4	462.3	46.6	47.0	97.2	40.7	34.4	162.8	36.7	40.4
LnGrp LOS	E	D	D	F	D	D	F	D	C	F	D	D
Approach Vol, veh/h		529			815			1035			1939	
Approach Delay, s/veh		50.2			181.4			46.7			55.5	
Approach LOS		D			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	57.1	14.0	29.9	14.0	62.1	15.1	28.8
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	15.0	31.5	10.0	45.0	10.0	36.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	17.0	25.4	12.0	14.4	10.9	57.7	11.2	20.3
Green Ext Time (p_c), s	0.0	5.4	0.0	4.3	0.0	0.0	0.0	4.0

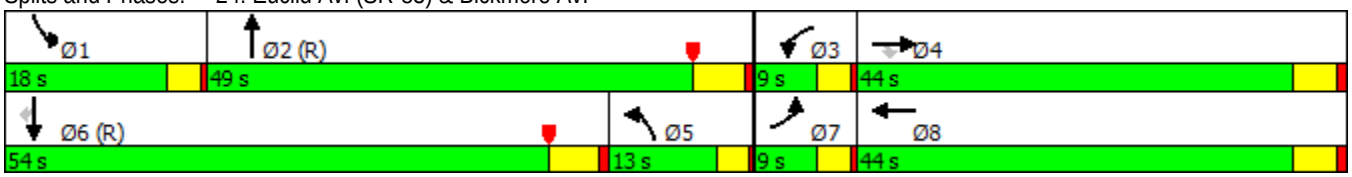
Intersection Summary	
HCM 2010 Ctrl Delay	76.5
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	29	11	21	43	28	48	931	98	1616	115
Future Volume (vph)	29	11	21	43	28	48	931	98	1616	115
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	9.0	44.0	44.0	9.0	44.0	13.0	49.0	18.0	54.0	54.0
Total Split (%)	7.5%	36.7%	36.7%	7.5%	36.7%	10.8%	40.8%	15.0%	45.0%	45.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	5.6	12.8	12.8	5.9	12.9	7.7	76.3	11.2	81.5	81.5
Actuated g/C Ratio	0.05	0.11	0.11	0.05	0.11	0.06	0.64	0.09	0.68	0.68
v/c Ratio	0.39	0.06	0.08	0.55	0.39	0.47	0.45	0.65	0.70	0.11
Control Delay	69.6	41.0	0.5	79.9	21.1	55.8	10.0	66.4	7.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.6	41.0	0.5	79.9	21.1	55.8	10.0	66.4	7.8	0.3
LOS	E	D	A	E	C	E	B	E	A	A
Approach Delay		41.0			40.4		12.2		10.5	
Approach LOS		D			D		B		B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 13.0 — Intersection LOS: B
Intersection Capacity Utilization 70.1% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	11	21	43	28	60	48	931	41	98	1616	115
Future Volume (veh/h)	29	11	21	43	28	60	48	931	41	98	1616	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	31	12	20	46	30	51	51	990	43	104	1719	113
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	46	119	101	58	44	75	577	2411	105	126	1459	653
Arrive On Green	0.03	0.06	0.06	0.03	0.07	0.07	0.34	0.68	0.68	0.15	0.81	0.81
Sat Flow, veh/h	1714	1900	1607	1714	633	1077	1714	3525	153	1714	3610	1615
Grp Volume(v), veh/h	31	12	20	46	0	81	51	507	526	104	1719	113
Grp Sat Flow(s),veh/h/ln	1714	1900	1607	1714	0	1710	1714	1805	1873	1714	1805	1615
Q Serve(g_s), s	2.2	0.7	0.8	3.2	0.0	5.6	2.4	14.8	14.8	7.1	48.5	1.6
Cycle Q Clear(g_c), s	2.2	0.7	0.8	3.2	0.0	5.6	2.4	14.8	14.8	7.1	48.5	1.6
Prop In Lane	1.00		1.00	1.00		0.63	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	46	119	101	58	0	119	577	1235	1281	126	1459	653
V/C Ratio(X)	0.67	0.10	0.20	0.79	0.00	0.68	0.09	0.41	0.41	0.82	1.18	0.17
Avail Cap(c_a), veh/h	79	618	522	79	0	556	577	1235	1281	207	1459	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	57.9	53.1	16.0	57.5	0.0	54.5	27.2	8.3	8.3	50.4	11.5	4.8
Incr Delay (d2), s/veh	6.2	0.1	0.4	22.3	0.0	2.5	0.0	0.1	0.1	0.5	80.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.4	0.4	1.9	0.0	2.7	1.2	7.4	7.6	3.4	38.7	0.7
LnGrp Delay(d),s/veh	64.1	53.2	16.4	79.9	0.0	57.0	27.2	8.4	8.4	50.9	92.4	4.9
LnGrp LOS	E	D	B	E		E	C	A	A	D	F	A
Approach Vol, veh/h		63			127			1084			1936	
Approach Delay, s/veh		46.9			65.3			9.3			85.1	
Approach LOS		D			E			A			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	87.6	7.6	12.5	45.9	54.0	6.7	13.4
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	5.5	* 5.5	3.5	5.0
Max Green Setting (Gmax), s	14.5	43.5	5.5	39.0	9.5	* 49	5.5	39.0
Max Q Clear Time (g_c+I1), s	9.1	16.8	5.2	2.8	4.4	50.5	4.2	7.6
Green Ext Time (p_c), s	0.0	3.6	0.0	0.3	0.1	0.0	0.0	0.3

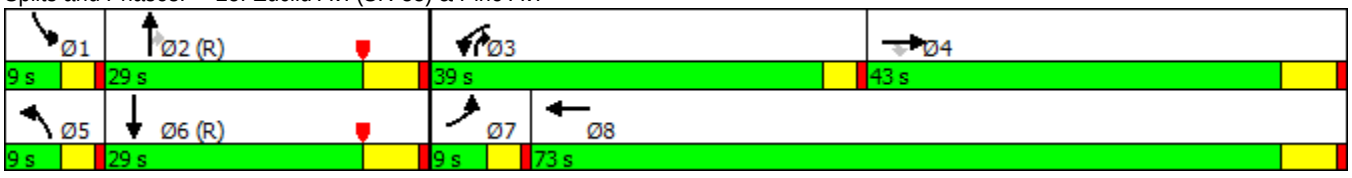
Intersection Summary	
HCM 2010 Ctrl Delay	58.0
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	53	329	199	705	418	186	745	518	247	1345
Future Volume (vph)	53	329	199	705	418	186	745	518	247	1345
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	28.0	28.0	31.3	56.1	17.7	23.0	56.3	17.7	23.0
Actuated g/C Ratio	0.04	0.23	0.23	0.26	0.47	0.15	0.19	0.47	0.15	0.19
v/c Ratio	0.76	0.75	0.42	0.87	0.71	0.75	1.09	0.60	0.99	2.11
Control Delay	111.3	52.9	15.0	54.6	28.4	67.1	95.1	10.2	90.0	525.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.3	52.9	15.0	54.6	28.4	67.1	95.1	10.2	90.0	525.7
LOS	F	D	B	D	C	E	F	B	F	F
Approach Delay		45.2			42.5		61.2			461.8
Approach LOS		D			D		E			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.11	
Intersection Signal Delay: 188.6	Intersection LOS: F
Intersection Capacity Utilization 107.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	329	199	705	418	187	186	745	518	247	1345	89
Future Volume (veh/h)	53	329	199	705	418	187	186	745	518	247	1345	89
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	54	332	0	712	422	174	188	753	345	249	1359	85
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	69	447	380	771	562	232	71	1122	887	71	1071	67
Arrive On Green	0.04	0.24	0.00	0.25	0.44	0.44	0.04	0.31	0.31	0.03	0.21	0.21
Sat Flow, veh/h	1714	1900	1615	3141	1274	525	1714	3610	1579	1714	3447	215
Grp Volume(v), veh/h	54	332	0	712	0	596	188	753	345	249	710	734
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1570	0	1799	1714	1805	1579	1714	1805	1857
Q Serve(g_s), s	3.7	19.4	0.0	26.5	0.0	33.2	5.0	21.8	14.9	5.0	37.3	37.3
Cycle Q Clear(g_c), s	3.7	19.4	0.0	26.5	0.0	33.2	5.0	21.8	14.9	5.0	37.3	37.3
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	69	447	380	771	0	793	71	1122	887	71	561	577
V/C Ratio(X)	0.79	0.74	0.00	0.92	0.00	0.75	2.63	0.67	0.39	3.49	1.27	1.27
Avail Cap(c_a), veh/h	71	586	498	916	0	1005	71	1122	887	71	561	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.38	0.38	0.38	0.65	0.65	0.65
Uniform Delay (d), s/veh	57.1	42.5	0.0	44.2	0.0	28.0	57.5	36.0	15.1	58.3	47.5	47.5
Incr Delay (d2), s/veh	38.4	4.5	0.0	12.2	0.0	2.9	749.7	1.2	0.5	1141.1	128.6	131.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	10.8	0.0	12.8	0.0	17.0	17.2	11.1	6.6	25.0	38.6	40.2
LnGrp Delay(d),s/veh	95.5	47.0	0.0	56.4	0.0	31.0	807.2	37.3	15.6	1199.4	176.1	178.8
LnGrp LOS	F	D		E		C	F	D	B	F	F	F
Approach Vol, veh/h		386			1308			1286			1693	
Approach Delay, s/veh		53.8			44.8			144.0			327.8	
Approach LOS		D			D			F			F	

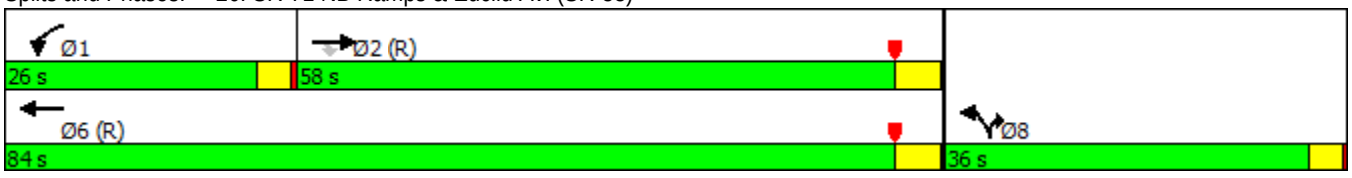
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	43.3	33.5	34.2	9.0	43.3	8.8	58.9
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	7.0	23.8	28.5	21.4	7.0	39.3	5.7	35.2
Green Ext Time (p_c), s	0.0	0.0	0.9	6.8	0.0	0.0	0.0	9.4

Intersection Summary	
HCM 2010 Ctrl Delay	175.4
HCM 2010 LOS	F

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	528	328	383	2116	234	942
Future Volume (vph)	528	328	383	2116	234	942
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	58.0	58.0	26.0	84.0	36.0	36.0
Total Split (%)	48.3%	48.3%	21.7%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	53.5	53.5	22.5	79.5	32.5	32.5
Actuated g/C Ratio	0.45	0.45	0.19	0.66	0.27	0.27
v/c Ratio	0.34	0.38	1.25	0.92	0.29	1.25
Control Delay	19.0	10.5	164.4	13.2	35.7	144.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	10.5	164.4	13.2	35.7	144.1
LOS	B	B	F	B	D	F
Approach Delay	15.7			36.4	122.5	
Approach LOS	B			D	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.25	
Intersection Signal Delay: 54.9	Intersection LOS: D
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	528	328	383	2116	234	942
Future Volume (veh/h)	528	328	383	2116	234	942
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1700	1900
Adj Flow Rate, veh/h	550	0	399	2204	244	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2230	998	321	3013	310	160
Arrive On Green	0.20	0.00	0.19	0.83	0.10	0.00
Sat Flow, veh/h	3705	1615	1714	3705	3141	1615
Grp Volume(v), veh/h	550	0	399	2204	244	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1714	1805	1570	1615
Q Serve(g_s), s	15.3	0.0	22.5	31.1	9.1	0.0
Cycle Q Clear(g_c), s	15.3	0.0	22.5	31.1	9.1	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2230	998	321	3013	310	160
V/C Ratio(X)	0.25	0.00	1.24	0.73	0.79	0.00
Avail Cap(c_a), veh/h	2230	998	321	3013	851	437
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	24.4	0.0	48.8	4.2	52.8	0.0
Incr Delay (d2), s/veh	0.3	0.0	111.1	0.1	4.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	20.5	15.1	4.2	0.0
LnGrp Delay(d),s/veh	24.6	0.0	159.9	4.4	57.2	0.0
LnGrp LOS	C		F	A	E	
Approach Vol, veh/h	550			2603	244	
Approach Delay, s/veh	24.6			28.2	57.2	
Approach LOS	C			C	E	

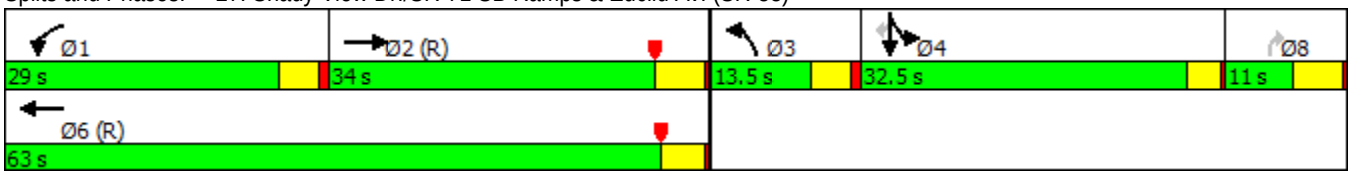
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	26.0	78.6				104.6		15.4
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	22.5	53.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	24.5	17.3				33.1		11.1
Green Ext Time (p_c), s	0.0	25.7				30.4		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	29.7
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	1038	454	676	71	241	276	24	64
Future Volume (vph)	1038	454	676	71	241	276	24	64
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	34.0	29.0	63.0	13.5	11.0	32.5	32.5	32.5
Total Split (%)	28.3%	24.2%	52.5%	11.3%	9.2%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	29.0	37.4	71.4	8.6	6.4	18.4	18.4	18.4
Actuated g/C Ratio	0.24	0.31	0.60	0.07	0.05	0.15	0.15	0.15
v/c Ratio	1.34	0.94	0.35	0.64	0.79	0.66	0.62	0.19
Control Delay	195.6	49.4	13.3	77.8	23.8	59.4	56.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	195.6	49.4	13.3	77.8	23.8	59.4	56.7	1.1
LOS	F	D	B	E	C	E	E	A
Approach Delay	195.6		27.8				48.1	
Approach LOS	F		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 3 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 93.2	Intersection LOS: F
Intersection Capacity Utilization 82.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1038	19	454	676	0	71	0	241	276	24	64
Future Volume (veh/h)	0	1038	19	454	676	0	71	0	241	276	24	64
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0	1800	0	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	1141	21	499	743	0	78	0	265	322	0	70
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	2066	38	350	2929	0	0	0	0	404	0	190
Arrive On Green	0.00	0.57	0.57	0.41	1.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Sat Flow, veh/h	0	3721	67	1714	3705	0		0		3429	0	1615
Grp Volume(v), veh/h	0	568	594	499	743	0		0.0		322	0	70
Grp Sat Flow(s),veh/h/ln	0	1805	1888	1714	1805	0				1714	0	1615
Q Serve(g_s), s	0.0	23.7	23.7	24.5	0.0	0.0				11.0	0.0	4.8
Cycle Q Clear(g_c), s	0.0	23.7	23.7	24.5	0.0	0.0				11.0	0.0	4.8
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1028	1076	350	2929	0				404	0	190
V/C Ratio(X)	0.00	0.55	0.55	1.43	0.25	0.00				0.80	0.00	0.37
Avail Cap(c_a), veh/h	0	1028	1076	350	2929	0				829	0	390
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.2	16.2	35.5	0.0	0.0				51.5	0.0	48.8
Incr Delay (d2), s/veh	0.0	2.1	2.0	207.5	0.2	0.0				3.6	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.3	12.8	31.6	0.1	0.0				5.4	0.0	2.2
LnGrp Delay(d),s/veh	0.0	18.3	18.3	243.0	0.2	0.0				55.2	0.0	50.0
LnGrp LOS		B	B	F	A					E		D
Approach Vol, veh/h		1162			1242						392	
Approach Delay, s/veh		18.3			97.7						54.2	
Approach LOS		B			F						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.0	73.4		17.6		102.4		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	24.5	29.0		29.0		* 59		
Max Q Clear Time (g_c+I1), s	26.5	25.7		13.0		2.0		
Green Ext Time (p_c), s	0.0	2.4		1.2		11.3		

Intersection Summary	
HCM 2010 Ctrl Delay	58.6
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	742	0	0	868	0	0	0	0	1	0	0
Future Vol, veh/h	4	742	0	0	868	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	815	0	0	954	0	0	0	0	1	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	954	0	-	-	-	0				1370	1778	477
Stage 1	-	-	-	-	-	-				954	954	-
Stage 2	-	-	-	-	-	-				416	824	-
Critical Hdwy	4.1	-	-	-	-	-				6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-				5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.8	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	729	-	0	0	-	-				140	83	540
Stage 1	-	-	0	0	-	-				339	340	-
Stage 2	-	-	0	0	-	-				640	390	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	729	-	-	-	-	-				139	0	540
Mov Cap-2 Maneuver	-	-	-	-	-	-				257	0	-
Stage 1	-	-	-	-	-	-				339	0	-
Stage 2	-	-	-	-	-	-				636	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	19.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	729	-	-	-	257
HCM Lane V/C Ratio	0.006	-	-	-	0.004
HCM Control Delay (s)	10	-	-	-	19.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	724	22	9	832	36	29
Future Vol, veh/h	724	22	9	832	36	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	754	23	9	867	38	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	777	0	1651	389
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	885	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	848	-	100	615
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	407	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	848	-	99	615
Mov Cap-2 Maneuver	-	-	-	-	293	-
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	403	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	293	615	-	-	848	-
HCM Lane V/C Ratio	0.128	0.049	-	-	0.011	-
HCM Control Delay (s)	19.1	11.2	-	-	9.3	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	724	22	98	832	36	141
Future Vol, veh/h	724	22	98	832	36	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	754	23	102	867	38	147

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	777	0	1837	389
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	1071	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	848	-	76	615
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	332	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	848	-	67	615
Mov Cap-2 Maneuver	-	-	-	-	235	-
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	292	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	235	615	-	-	848	-
HCM Lane V/C Ratio	0.16	0.239	-	-	0.12	-
HCM Control Delay (s)	23.2	12.7	-	-	9.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.9	-	-	0.4	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	719	43	799	42	86
Future Volume (vph)	719	43	799	42	86
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	33.0	9.6	42.6	17.4	17.4
Total Split (%)	55.0%	16.0%	71.0%	29.0%	29.0%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	25.2	5.1	28.6	12.5	12.5
Actuated g/C Ratio	0.48	0.10	0.54	0.24	0.24
v/c Ratio	0.48	0.28	0.85	0.11	0.21
Control Delay	10.9	29.8	19.2	19.5	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	29.8	19.2	19.5	6.8
LOS	B	C	B	B	A
Approach Delay	10.9		19.8	11.0	
Approach LOS	B		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	719	34	43	799	42	86
Future Volume (veh/h)	719	34	43	799	42	86
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	790	37	47	878	46	92
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1526	71	80	1076	387	365
Arrive On Green	0.44	0.44	0.05	0.57	0.23	0.23
Sat Flow, veh/h	3602	164	1714	1900	1714	1615
Grp Volume(v), veh/h	406	421	47	878	46	92
Grp Sat Flow(s),veh/h/ln	1805	1867	1714	1900	1714	1615
Q Serve(g_s), s	8.9	8.9	1.5	20.3	1.2	2.5
Cycle Q Clear(g_c), s	8.9	8.9	1.5	20.3	1.2	2.5
Prop In Lane		0.09	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	785	812	80	1076	387	365
V/C Ratio(X)	0.52	0.52	0.59	0.82	0.12	0.25
Avail Cap(c_a), veh/h	889	919	157	1271	387	365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	25.4	9.5	16.8	17.3
Incr Delay (d2), s/veh	0.5	0.5	2.5	3.7	0.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	4.7	0.7	11.6	0.6	1.3
LnGrp Delay(d),s/veh	11.7	11.7	28.0	13.2	17.4	18.9
LnGrp LOS	B	B	C	B	B	B
Approach Vol, veh/h	827			925	138	
Approach Delay, s/veh	11.7			13.9	18.4	
Approach LOS	B			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.1	29.9				37.0		17.4
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	26.8				36.4		12.3
Max Q Clear Time (g_c+I1), s	3.5	10.9				22.3		4.5
Green Ext Time (p_c), s	0.0	9.2				8.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	831	176	888	42	199
Future Volume (vph)	831	176	888	42	199
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	22.5	5.1	32.3	10.1	10.1
Actuated g/C Ratio	0.42	0.09	0.60	0.19	0.19
v/c Ratio	0.63	1.21	0.86	0.14	0.46
Control Delay	13.9	167.4	18.1	22.1	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	167.4	18.1	22.1	7.5
LOS	B	F	B	C	A
Approach Delay	13.9		42.7	10.1	
Approach LOS	B		D	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 27.6	Intersection LOS: C
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	831	34	176	888	42	199
Future Volume (veh/h)	831	34	176	888	42	199
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	913	37	193	976	46	216
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1566	63	154	1171	309	291
Arrive On Green	0.44	0.44	0.09	0.62	0.18	0.18
Sat Flow, veh/h	3628	143	1714	1900	1714	1615
Grp Volume(v), veh/h	466	484	193	976	46	216
Grp Sat Flow(s),veh/h/ln	1805	1871	1714	1900	1714	1615
Q Serve(g_s), s	10.8	10.8	5.0	22.5	1.3	7.0
Cycle Q Clear(g_c), s	10.8	10.8	5.0	22.5	1.3	7.0
Prop In Lane		0.08	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	800	829	154	1171	309	291
V/C Ratio(X)	0.58	0.58	1.25	0.83	0.15	0.74
Avail Cap(c_a), veh/h	946	981	154	1325	309	291
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	11.6	25.2	8.4	19.2	21.5
Incr Delay (d2), s/veh	0.7	0.7	154.7	4.3	1.0	15.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	5.7	9.0	12.8	0.7	4.4
LnGrp Delay(d),s/veh	12.3	12.3	180.0	12.7	20.2	37.2
LnGrp LOS	B	B	F	B	C	D
Approach Vol, veh/h	950			1169	262	
Approach Delay, s/veh	12.3			40.3	34.2	
Approach LOS	B			D	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.6	30.8				40.4		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	7.0	12.8				24.5		9.0
Green Ext Time (p_c), s	0.0	10.7				9.7		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.4
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	669	144	653	189	191
Future Volume (vph)	669	144	653	189	191
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	20.2	5.4	30.2	13.5	13.5
Actuated g/C Ratio	0.37	0.10	0.55	0.25	0.25
v/c Ratio	0.70	0.95	0.70	0.50	0.52
Control Delay	17.7	91.7	12.9	23.9	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	91.7	12.9	23.9	23.1
LOS	B	F	B	C	C
Approach Delay	17.7		27.2	23.5	
Approach LOS	B		C	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 54.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 55.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	669	137	144	653	189	191
Future Volume (veh/h)	669	137	144	653	189	191
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	752	154	162	734	212	197
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1131	232	168	1067	416	392
Arrive On Green	0.38	0.38	0.10	0.56	0.24	0.24
Sat Flow, veh/h	3065	608	1714	1900	1714	1615
Grp Volume(v), veh/h	457	449	162	734	212	197
Grp Sat Flow(s),veh/h/ln	1805	1773	1714	1900	1714	1615
Q Serve(g_s), s	11.6	11.6	5.2	15.2	5.9	5.8
Cycle Q Clear(g_c), s	11.6	11.6	5.2	15.2	5.9	5.8
Prop In Lane		0.34	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	687	675	168	1067	416	392
V/C Ratio(X)	0.67	0.67	0.97	0.69	0.51	0.50
Avail Cap(c_a), veh/h	843	828	168	1232	416	392
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.2	14.2	24.8	8.6	18.1	18.0
Incr Delay (d2), s/veh	1.5	1.5	59.1	1.3	4.4	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	5.9	5.2	8.1	3.3	3.1
LnGrp Delay(d),s/veh	15.6	15.7	83.9	10.0	22.5	22.6
LnGrp LOS	B	B	F	A	C	C
Approach Vol, veh/h	906			896	409	
Approach Delay, s/veh	15.6			23.4	22.5	
Approach LOS	B			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.0	27.2				37.2		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	7.2	13.6				17.2		7.9
Green Ext Time (p_c), s	0.0	7.3				9.6		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	894	144	875	189	191
Future Volume (vph)	894	144	875	189	191
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	23.8	5.4	33.8	13.4	13.4
Actuated g/C Ratio	0.41	0.09	0.58	0.23	0.23
v/c Ratio	0.80	1.02	0.89	0.54	0.56
Control Delay	20.1	111.7	22.9	26.2	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	111.7	22.9	26.2	25.3
LOS	C	F	C	C	C
Approach Delay	20.1		35.5	25.7	
Approach LOS	C		D	C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 58.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 27.4 — Intersection LOS: C
Intersection Capacity Utilization 66.1% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	894	137	144	875	189	191
Future Volume (veh/h)	894	137	144	875	189	191
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1004	154	162	983	212	197
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1303	200	158	1116	392	369
Arrive On Green	0.42	0.42	0.09	0.59	0.23	0.23
Sat Flow, veh/h	3221	479	1714	1900	1714	1615
Grp Volume(v), veh/h	579	579	162	983	212	197
Grp Sat Flow(s),veh/h/ln	1805	1800	1714	1900	1714	1615
Q Serve(g_s), s	16.2	16.2	5.4	25.9	6.4	6.3
Cycle Q Clear(g_c), s	16.2	16.2	5.4	25.9	6.4	6.3
Prop In Lane		0.27	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	752	750	158	1116	392	369
V/C Ratio(X)	0.77	0.77	1.03	0.88	0.54	0.53
Avail Cap(c_a), veh/h	794	792	158	1160	392	369
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	14.7	26.6	10.3	19.9	19.9
Incr Delay (d2), s/veh	4.4	4.5	78.7	7.9	5.3	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.3	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	8.8	6.0	15.8	3.6	3.4
LnGrp Delay(d),s/veh	19.1	19.2	105.6	18.3	25.2	25.3
LnGrp LOS	B	B	F	B	C	C
Approach Vol, veh/h	1158			1145	409	
Approach Delay, s/veh	19.1			30.6	25.3	
Approach LOS	B			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.0	30.6				40.6		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	7.4	18.2				27.9		8.4
Green Ext Time (p_c), s	0.0	6.2				6.4		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	75.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	313	506	41	12	591	56	52	25	23	132	16	154
Future Vol, veh/h	313	506	41	12	591	56	52	25	23	132	16	154
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	329	533	43	13	622	59	55	26	24	139	17	162

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	682	0	0	578	0	0	1981	1922	291	1617	1915	653
Stage 1	-	-	-	-	-	-	1215	1215	-	678	678	-
Stage 2	-	-	-	-	-	-	766	707	-	939	1237	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	920	-	-	1006	-	-	~ 42	68	712	~ 77	68	471
Stage 1	-	-	-	-	-	-	195	256	-	445	455	-
Stage 2	-	-	-	-	-	-	398	441	-	288	250	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	920	-	-	1005	-	-	~ 18	43	710	~ 40	43	471
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ -1192	77	-	~ 100	115	-
Stage 1	-	-	-	-	-	-	125	164	-	286	449	-
Stage 2	-	-	-	-	-	-	248	435	-	150	160	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4	0.2	21.7	$ 464
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	319	920	-	-	1005	-	-	169
HCM Lane V/C Ratio	0.33	0.358	-	-	0.013	-	-	1.881
HCM Control Delay (s)	21.7	11.1	-	-	8.6	-	-	$ 464
HCM Lane LOS	C	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.4	1.6	-	-	0	-	-	23.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	303

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	313	731	41	12	813	279	52	25	23	207	16	154
Future Vol, veh/h	313	731	41	12	813	279	52	25	23	207	16	154
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	329	769	43	13	856	294	55	26	24	218	17	162

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1150	0	0	815	0	0	2569	2628	409	2087	2503	1004
Stage 1	-	-	-	-	-	-	1452	1452	-	1029	1029	-
Stage 2	-	-	-	-	-	-	1117	1176	-	1058	1474	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	615	-	-	821	-	-	~ 15	~ 24	597	~ 35	29	296
Stage 1	-	-	-	-	-	-	140	197	-	285	314	-
Stage 2	-	-	-	-	-	-	254	267	-	244	192	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	615	-	-	820	-	-	~ 3	~ 11	595	~ 19	~ 13	296
Mov Cap-2 Maneuver	-	-	-	-	-	-	81	~ -1864	-	~ 47	59	-
Stage 1	-	-	-	-	-	-	65	91	-	~ 132	309	-
Stage 2	-	-	-	-	-	-	107	263	-	~ 77	89	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5	0.1	71.8	$ 2109.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	150	615	-	-	820	-	-	73
HCM Lane V/C Ratio	0.702	0.536	-	-	0.015	-	-	5.436
HCM Control Delay (s)	71.8	17.4	-	-	9.5	-	-	$ 2109.3
HCM Lane LOS	F	C	-	-	A	-	-	F
HCM 95th %tile Q(veh)	4.1	3.2	-	-	0	-	-	43.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	533	19	33	569	8	74	0	28	2	0	16
Future Vol, veh/h	109	533	19	33	569	8	74	0	28	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	586	21	36	625	9	81	0	31	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	634	0	0	608	0	0	1545	1540	304	1232	1547	630
Stage 1	-	-	-	-	-	-	834	834	-	702	702	-
Stage 2	-	-	-	-	-	-	711	706	-	530	845	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	959	-	-	980	-	-	87	117	698	145	115	485
Stage 1	-	-	-	-	-	-	333	386	-	432	443	-
Stage 2	-	-	-	-	-	-	427	442	-	506	382	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	959	-	-	980	-	-	~ 74	99	697	122	97	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	204	235	-	122	97	-
Stage 1	-	-	-	-	-	-	292	338	-	379	427	-
Stage 2	-	-	-	-	-	-	397	426	-	424	335	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.5	30.1	15.5
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	253	959	-	-	980	-	-	364
HCM Lane V/C Ratio	0.443	0.124	-	-	0.037	-	-	0.054
HCM Control Delay (s)	30.1	9.3	-	-	8.8	-	-	15.5
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	2.1	0.4	-	-	0.1	-	-	0.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	12.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	833	19	33	1014	8	74	0	28	2	0	16
Future Vol, veh/h	109	833	19	33	1014	8	74	0	28	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	915	21	36	1114	9	81	0	31	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1123	0	0	937	0	0	2364	2360	469	1886	2365	1119
Stage 1	-	-	-	-	-	-	1164	1164	-	1191	1191	-
Stage 2	-	-	-	-	-	-	1200	1196	-	695	1174	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	629	-	-	739	-	-	~ 22	36	546	49	36	254
Stage 1	-	-	-	-	-	-	210	271	-	231	263	-
Stage 2	-	-	-	-	-	-	228	262	-	403	268	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	629	-	-	739	-	-	~ 17	28	545	38	28	254
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 72	109	-	38	28	-
Stage 1	-	-	-	-	-	-	170	220	-	188	250	-
Stage 2	-	-	-	-	-	-	202	249	-	309	218	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.3	230.9	31.4
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	95	629	-	-	739	-	-	156
HCM Lane V/C Ratio	1.18	0.188	-	-	0.049	-	-	0.125
HCM Control Delay (s)	230.9	12	-	-	10.1	-	-	31.4
HCM Lane LOS	F	B	-	-	B	-	-	D
HCM 95th %tile Q(veh)	7.6	0.7	-	-	0.2	-	-	0.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	172.5
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	256	175	132	0	99	261	50	0	163	521	148
Future Vol, veh/h	0	256	175	132	0	99	261	50	0	163	521	148
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	275	188	142	0	106	281	54	0	175	560	159
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	3
HCM Control Delay	37.3	42	388.3
HCM LOS	E	E	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	78%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	22%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	163	669	256	175	132	99	261	50	21	135	186
LT Vol	163	0	256	0	0	99	0	0	21	0	0
Through Vol	0	521	0	175	0	0	261	0	0	135	0
RT Vol	0	148	0	0	132	0	0	50	0	0	186
Lane Flow Rate	175	719	275	188	142	106	281	54	23	145	200
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.516	1.989	0.816	0.532	0.375	0.328	0.828	0.148	0.072	0.442	0.57
Departure Headway (Hd)	10.608	9.953	12.417	11.891	11.156	12.903	12.377	11.641	13.115	12.593	11.863
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	340	374	295	305	325	281	295	310	275	287	306
Service Time	8.358	7.703	10.117	9.591	8.856	10.603	10.077	9.341	10.815	10.293	9.563
HCM Lane V/C Ratio	0.515	1.922	0.932	0.616	0.437	0.377	0.953	0.174	0.084	0.505	0.654
HCM Control Delay	24.2	477	52.9	27.3	20.4	21.8	54.5	16.4	16.8	24.9	29.2
HCM Lane LOS	C	F	F	D	C	C	F	C	C	C	D
HCM 95th-tile Q	2.8	49.9	6.7	2.9	1.7	1.4	6.9	0.5	0.2	2.1	3.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	21	135	186
Future Vol, veh/h	0	21	135	186
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	23	145	200
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	26.7
HCM LOS	D

Intersection	
Intersection Delay, s/veh	460.6
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	256	475	132	0	331	706	50	0	163	521	298
Future Vol, veh/h	0	256	475	132	0	331	706	50	0	163	521	298
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	275	511	142	0	356	759	54	0	175	560	320
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	3
HCM Control Delay	219.5	510.8	764.6
HCM LOS	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	64%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	36%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	163	819	256	475	132	331	706	50	21	135	186
LT Vol	163	0	256	0	0	331	0	0	21	0	0
Through Vol	0	521	0	475	0	0	706	0	0	135	0
RT Vol	0	298	0	0	132	0	0	50	0	0	186
Lane Flow Rate	175	881	275	511	142	356	759	54	23	145	200
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.621	2.936	0.924	1.643	0.429	1.208	2.472	0.165	0.083	0.516	0.672
Departure Headway (Hd)	14.922	14.167	16.453	15.926	15.188	15.947	15.415	14.67	15.564	15.04	14.307
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	244	264	223	235	238	231	243	246	232	241	254
Service Time	12.622	11.867	14.153	13.626	12.888	13.647	13.115	12.37	13.264	12.74	12.007
HCM Lane V/C Ratio	0.717	3.337	1.233	2.174	0.597	1.541	3.123	0.22	0.099	0.602	0.787
HCM Control Delay	39.3	909	86.5	344.1	28.8	169.7	705.5	20.2	19.7	32.7	42.1
HCM Lane LOS	E	F	F	F	D	F	F	C	C	D	E
HCM 95th-tile Q	3.7	65.8	7.7	24	2	13.5	47.5	0.6	0.3	2.7	4.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	21	135	186
Future Vol, veh/h	0	21	135	186
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	23	145	200
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	37
HCM LOS	E

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	514	1286	1376	812	648	1319	
Future Volume (vph)	514	1286	1376	812	648	1319	
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA	
Protected Phases	3	1	2	3	1	6	8
Permitted Phases		8		2			
Detector Phase	3	1	2	3	1	6	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0	36.3
Total Split (s)	36.3	27.0	56.7	36.3	27.0	83.7	36.3
Total Split (%)	30.3%	22.5%	47.3%	30.3%	22.5%	69.8%	30%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0	
Lead/Lag		Lead	Lag		Lead		
Lead-Lag Optimize?		Yes	Yes		Yes		
Recall Mode	None	None	Min	None	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	514	0	1286	0	1376	812	648	1319	0
Future Volume (veh/h)	0	0	0	514	0	1286	0	1376	812	648	1319	0
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	0	1900	0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h				535	0	1275	0	1433	846	675	1374	0
Adj No. of Lanes				1	0	1	0	1	1	1	1	0
Peak Hour Factor				0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				466	0	712	0	817	1096	331	1243	0
Arrive On Green				0.26	0.00	0.26	0.00	0.43	0.43	0.18	0.65	0.00
Sat Flow, veh/h				1810	0	1615	0	1900	1581	1810	1900	0
Grp Volume(v), veh/h				535	0	1275	0	1433	846	675	1374	0
Grp Sat Flow(s),veh/h/ln				1810	0	1615	0	1900	1581	1810	1900	0
Q Serve(g_s), s				31.0	0.0	31.0	0.0	51.7	43.3	22.0	78.7	0.0
Cycle Q Clear(g_c), s				31.0	0.0	31.0	0.0	51.7	43.3	22.0	78.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h				466	0	712	0	817	1096	331	1243	0
V/C Ratio(X)				1.15	0.00	1.79	0.00	1.75	0.77	2.04	1.11	0.00
Avail Cap(c_a), veh/h				466	0	712	0	817	1096	331	1243	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				44.6	0.0	33.7	0.0	34.3	12.6	49.2	20.8	0.0
Incr Delay (d2), s/veh				88.8	0.0	362.0	0.0	344.8	3.6	478.3	59.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				26.9	0.0	95.1	0.0	105.2	19.8	54.9	61.3	0.0
LnGrp Delay(d),s/veh				133.4	0.0	395.7	0.0	379.1	16.2	527.5	80.3	0.0
LnGrp LOS				F		F		F	B	F	F	
Approach Vol, veh/h					1810			2279			2049	
Approach Delay, s/veh					318.1			244.4			227.6	
Approach LOS					F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	27.0	57.0				84.0		36.3
Change Period (Y+Rc), s	5.0	5.3				* 5.3		5.3
Max Green Setting (Gmax), s	22.0	51.4				* 79		31.0
Max Q Clear Time (g_c+I1), s	24.0	53.7				80.7		33.0
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0

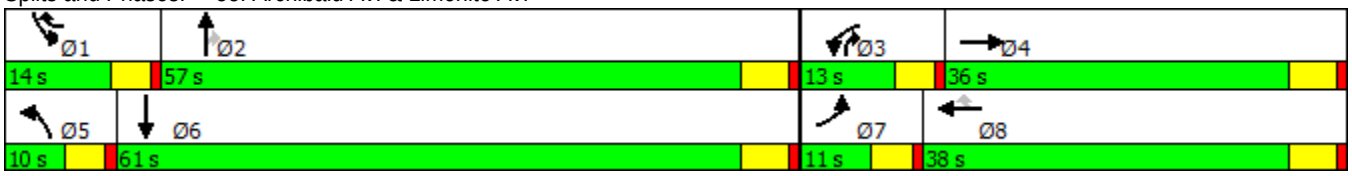
Intersection Summary		
HCM 2010 Ctrl Delay		260.5
HCM 2010 LOS		F

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	230	608	329	647	824	120	1376	404	448	1319
Future Volume (vph)	230	608	329	647	824	120	1376	404	448	1319
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4	3	8	1	5	2	3	1	6
Permitted Phases					8			2		
Detector Phase	7	4	3	8	1	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0
Minimum Split (s)	9.6	33.3	9.6	33.3	9.6	9.6	46.3	9.6	9.6	46.3
Total Split (s)	11.0	36.0	13.0	38.0	14.0	10.0	57.0	13.0	14.0	61.0
Total Split (%)	9.2%	30.0%	10.8%	31.7%	11.7%	8.3%	47.5%	10.8%	11.7%	50.8%
Yellow Time (s)	3.6	4.3	3.6	4.3	3.6	3.6	4.3	3.6	3.6	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.3	4.6	5.3	4.6	4.6	5.3	4.6	4.6	5.3
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	608	92	329	647	824	120	1376	404	448	1319	223
Future Volume (veh/h)	230	608	92	329	647	824	120	1376	404	448	1319	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	250	661	100	343	703	793	130	1433	421	467	1374	242
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	413	62	127	518	567	81	819	800	142	731	129
Arrive On Green	0.05	0.26	0.26	0.07	0.27	0.27	0.05	0.43	0.43	0.08	0.46	0.46
Sat Flow, veh/h	1810	1613	244	1810	1900	1615	1810	1900	1595	1810	1574	277
Grp Volume(v), veh/h	250	0	761	343	703	793	130	1433	421	467	0	1616
Grp Sat Flow(s),veh/h/ln	1810	0	1857	1810	1900	1615	1810	1900	1595	1810	0	1851
Q Serve(g_s), s	6.4	0.0	30.7	8.4	32.7	32.7	5.4	51.7	21.5	9.4	0.0	55.7
Cycle Q Clear(g_c), s	6.4	0.0	30.7	8.4	32.7	32.7	5.4	51.7	21.5	9.4	0.0	55.7
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	97	0	475	127	518	567	81	819	800	142	0	859
V/C Ratio(X)	2.59	0.00	1.60	2.71	1.36	1.40	1.60	1.75	0.53	3.29	0.00	1.88
Avail Cap(c_a), veh/h	97	0	475	127	518	567	81	819	800	142	0	859
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.8	0.0	44.7	55.8	43.6	39.0	57.3	34.2	20.3	55.3	0.0	32.2
Incr Delay (d2), s/veh	744.9	0.0	280.6	790.5	173.3	190.3	318.3	342.8	0.7	1050.5	0.0	400.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.2	0.0	52.7	32.0	42.0	48.7	9.9	105.0	9.6	46.0	0.0	124.1
LnGrp Delay(d),s/veh	801.7	0.0	325.2	846.3	216.9	229.3	375.6	377.0	21.1	1105.8	0.0	432.9
LnGrp LOS	F		F	F	F	F	F	F	C	F		F
Approach Vol, veh/h		1011			1839			1984			2083	
Approach Delay, s/veh		443.0			339.6			301.4			583.8	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	57.0	13.0	36.0	10.0	61.0	11.0	38.0
Change Period (Y+Rc), s	4.6	5.3	4.6	5.3	4.6	5.3	4.6	5.3
Max Green Setting (Gmax), s	9.4	51.7	8.4	30.7	5.4	55.7	6.4	32.7
Max Q Clear Time (g_c+I1), s	11.4	53.7	10.4	32.7	7.4	57.7	8.4	34.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	417.3
HCM 2010 LOS	F

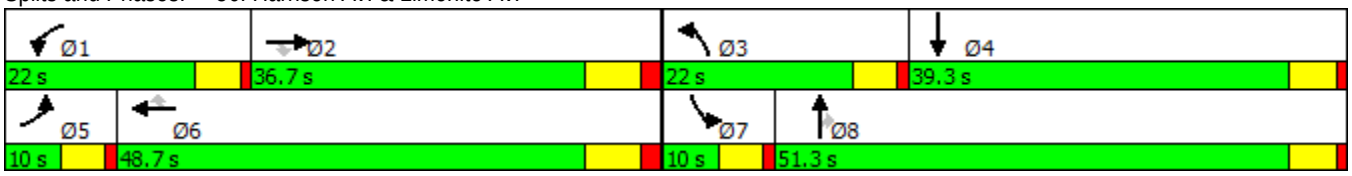
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	71	1632	57	38	1545	82	119	57	144	164	30
Future Volume (vph)	71	1632	57	38	1545	82	119	57	144	164	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	10.0	36.7	36.7	22.0	48.7	48.7	22.0	51.3	51.3	10.0	39.3
Total Split (%)	8.3%	30.6%	30.6%	18.3%	40.6%	40.6%	18.3%	42.8%	42.8%	8.3%	32.8%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 92.3
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	1632	57	38	1545	82	119	57	144	164	30	136
Future Volume (veh/h)	71	1632	57	38	1545	82	119	57	144	164	30	136
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	77	1774	60	41	1679	89	129	62	123	178	33	127
Adj No. of Lanes	1	3	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	99	2520	785	65	1685	738	161	329	279	101	47	181
Arrive On Green	0.05	0.49	0.49	0.04	0.47	0.47	0.09	0.17	0.17	0.06	0.14	0.14
Sat Flow, veh/h	1810	5187	1615	1810	3610	1581	1810	1900	1612	1810	336	1291
Grp Volume(v), veh/h	77	1774	60	41	1679	89	129	62	123	178	0	160
Grp Sat Flow(s),veh/h/ln	1810	1729	1615	1810	1805	1581	1810	1900	1612	1810	0	1627
Q Serve(g_s), s	3.8	23.9	1.8	2.0	41.4	2.8	6.2	2.5	6.1	5.0	0.0	8.4
Cycle Q Clear(g_c), s	3.8	23.9	1.8	2.0	41.4	2.8	6.2	2.5	6.1	5.0	0.0	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	99	2520	785	65	1685	738	161	329	279	101	0	227
V/C Ratio(X)	0.78	0.70	0.08	0.63	1.00	0.12	0.80	0.19	0.44	1.76	0.00	0.70
Avail Cap(c_a), veh/h	101	2520	785	344	1685	738	344	978	830	101	0	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.7	18.0	12.3	42.5	23.8	13.5	39.9	31.6	33.1	42.2	0.0	36.7
Incr Delay (d2), s/veh	27.5	0.9	0.0	3.8	21.1	0.1	3.4	0.3	1.1	378.3	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	11.5	0.8	1.1	25.5	1.2	3.3	1.3	2.8	13.1	0.0	4.0
LnGrp Delay(d),s/veh	69.2	18.9	12.3	46.3	44.9	13.5	43.3	31.9	34.2	420.5	0.0	40.6
LnGrp LOS	E	B	B	D	D	B	D	C	C	F		D
Approach Vol, veh/h		1911			1809			314			338	
Approach Delay, s/veh		20.7			43.4			37.5			240.7	
Approach LOS		C			D			D			F	

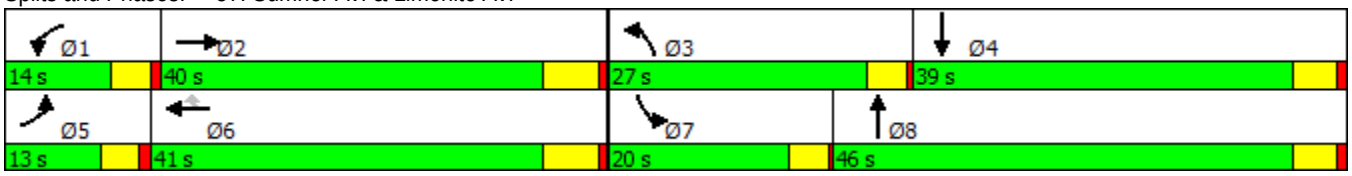
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	50.4	13.0	17.8	9.9	48.7	10.0	20.8
Change Period (Y+Rc), s	5.0	7.0	5.0	5.3	5.0	7.0	5.0	5.3
Max Green Setting (Gmax), s	17.0	29.7	17.0	34.0	5.0	41.7	5.0	46.0
Max Q Clear Time (g_c+I1), s	4.0	25.9	8.2	10.4	5.8	43.4	7.0	8.1
Green Ext Time (p_c), s	0.0	3.7	0.1	1.6	0.0	0.0	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	48.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	100	1634	165	1282	22	388	212	126	140
Future Volume (vph)	100	1634	165	1282	22	388	212	126	140
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	1	6		3	8	7	4
Permitted Phases					6				
Detector Phase	5	2	1	6	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	13.0	40.0	14.0	41.0	41.0	27.0	46.0	20.0	39.0
Total Split (%)	10.8%	33.3%	11.7%	34.2%	34.2%	22.5%	38.3%	16.7%	32.5%
Yellow Time (s)	3.5	5.0	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 98.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	1634	295	165	1282	22	388	212	276	126	140	96
Future Volume (veh/h)	100	1634	295	165	1282	22	388	212	276	126	140	96
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	108	1757	309	177	1378	18	417	228	223	135	151	76
Adj No. of Lanes	2	3	0	2	3	1	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	171	1598	278	247	1977	616	440	491	433	167	285	136
Arrive On Green	0.05	0.36	0.36	0.07	0.38	0.38	0.24	0.27	0.27	0.09	0.12	0.12
Sat Flow, veh/h	3510	4447	774	3510	5187	1615	1810	1805	1591	1810	2359	1126
Grp Volume(v), veh/h	108	1362	704	177	1378	18	417	228	223	135	114	113
Grp Sat Flow(s),veh/h/ln	1755	1729	1763	1755	1729	1615	1810	1805	1591	1810	1805	1680
Q Serve(g_s), s	2.9	34.0	34.0	4.7	21.2	0.7	21.4	10.0	11.2	6.9	5.6	6.0
Cycle Q Clear(g_c), s	2.9	34.0	34.0	4.7	21.2	0.7	21.4	10.0	11.2	6.9	5.6	6.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	171	1243	634	247	1977	616	440	491	433	167	218	203
V/C Ratio(X)	0.63	1.10	1.11	0.72	0.70	0.03	0.95	0.46	0.52	0.81	0.52	0.56
Avail Cap(c_a), veh/h	315	1243	634	353	1977	616	440	782	690	306	649	604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	30.3	30.3	43.0	24.7	18.3	35.2	28.7	29.2	42.1	39.0	39.2
Incr Delay (d2), s/veh	1.4	56.0	69.8	1.5	1.1	0.0	29.6	0.5	0.7	3.5	1.4	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	25.7	28.7	2.3	10.3	0.3	14.3	5.0	5.0	3.6	2.9	2.9
LnGrp Delay(d),s/veh	45.6	86.3	100.1	44.6	25.7	18.3	64.9	29.2	29.9	45.6	40.4	41.0
LnGrp LOS	D	F	F	D	C	B	E	C	C	D	D	D
Approach Vol, veh/h		2174			1573			868			362	
Approach Delay, s/veh		88.7			27.8			46.5			42.6	
Approach LOS		F			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	40.0	27.0	16.4	9.1	42.1	12.7	30.7
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	9.5	34.0	23.0	34.0	8.5	35.0	16.0	41.0
Max Q Clear Time (g_c+I1), s	6.7	36.0	23.4	8.0	4.9	23.2	8.9	13.2
Green Ext Time (p_c), s	0.1	0.0	0.0	3.1	0.0	11.2	0.1	3.1

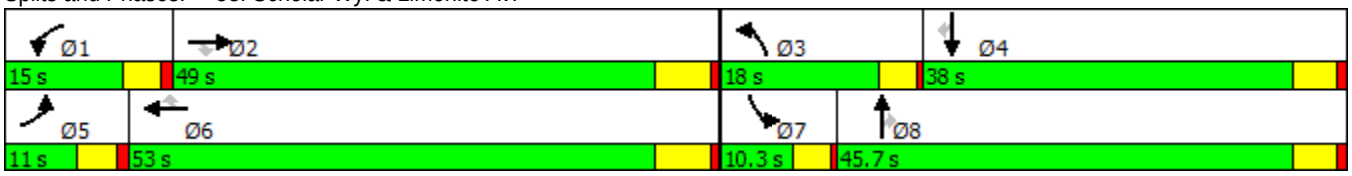
Intersection Summary	
HCM 2010 Ctrl Delay	58.7
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1727	88	90	1295	21	125	147	218	39	194	58
Future Volume (vph)	45	1727	88	90	1295	21	125	147	218	39	194	58
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	11.0	49.0	49.0	15.0	53.0	53.0	18.0	45.7	45.7	10.3	38.0	38.0
Total Split (%)	9.2%	40.8%	40.8%	12.5%	44.2%	44.2%	15.0%	38.1%	38.1%	8.6%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 96.9
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1727	88	90	1295	21	125	147	218	39	194	58
Future Volume (veh/h)	45	1727	88	90	1295	21	125	147	218	39	194	58
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	1877	87	98	1408	23	136	160	197	42	211	61
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	1774	794	125	1899	850	169	355	301	53	444	187
Arrive On Green	0.03	0.49	0.49	0.07	0.53	0.53	0.09	0.19	0.19	0.03	0.12	0.12
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1612	1810	3610	1525
Grp Volume(v), veh/h	49	1877	87	98	1408	23	136	160	197	42	211	61
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1612	1810	1805	1525
Q Serve(g_s), s	2.4	43.0	2.5	4.7	26.5	0.6	6.4	6.5	9.9	2.0	4.8	3.2
Cycle Q Clear(g_c), s	2.4	43.0	2.5	4.7	26.5	0.6	6.4	6.5	9.9	2.0	4.8	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	63	1774	794	125	1899	850	169	355	301	53	444	187
V/C Ratio(X)	0.78	1.06	0.11	0.78	0.74	0.03	0.80	0.45	0.65	0.79	0.48	0.33
Avail Cap(c_a), veh/h	134	1774	794	217	1939	868	290	884	750	130	1362	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	22.2	12.0	40.1	16.1	10.0	38.9	31.6	32.9	42.2	35.7	35.1
Incr Delay (d2), s/veh	7.6	38.6	0.1	3.9	1.5	0.0	3.4	0.7	1.8	9.3	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	30.7	1.1	2.5	13.5	0.3	3.4	3.5	4.5	1.1	2.4	1.4
LnGrp Delay(d),s/veh	49.5	60.8	12.0	44.0	17.6	10.0	42.2	32.2	34.7	51.4	36.3	35.8
LnGrp LOS	D	F	B	D	B	A	D	C	C	D	D	D
Approach Vol, veh/h		2013			1529			493			314	
Approach Delay, s/veh		58.4			19.2			36.0			38.3	
Approach LOS		E			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	49.0	12.2	15.7	7.5	52.0	6.6	21.4
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	10.5	43.0	14.0	33.0	6.5	47.0	6.3	40.7
Max Q Clear Time (g_c+I1), s	6.7	45.0	8.4	6.8	4.4	28.5	4.0	11.9
Green Ext Time (p_c), s	0.0	0.0	0.0	2.3	0.0	17.3	0.0	2.3

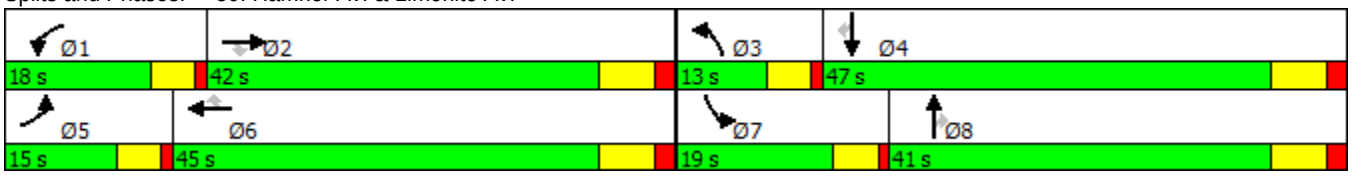
Intersection Summary	
HCM 2010 Ctrl Delay	40.6
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	317	1373	101	162	872	506	126	657	317	660	437	262
Future Volume (vph)	317	1373	101	162	872	506	126	657	317	660	437	262
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0
Total Split (s)	15.0	42.0	42.0	18.0	45.0	45.0	13.0	41.0	41.0	19.0	47.0	47.0
Total Split (%)	12.5%	35.0%	35.0%	15.0%	37.5%	37.5%	10.8%	34.2%	34.2%	15.8%	39.2%	39.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.8
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	1373	101	162	872	506	126	657	317	660	437	262
Future Volume (veh/h)	317	1373	101	162	872	506	126	657	317	660	437	262
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	327	1415	98	167	899	484	130	677	209	680	451	217
Adj No. of Lanes	2	3	1	2	2	1	2	3	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	310	1792	557	227	1162	518	187	1317	402	434	1170	522
Arrive On Green	0.09	0.35	0.35	0.06	0.32	0.32	0.05	0.25	0.25	0.12	0.32	0.32
Sat Flow, veh/h	3510	5187	1612	3510	3610	1610	3510	5187	1585	3510	3610	1611
Grp Volume(v), veh/h	327	1415	98	167	899	484	130	677	209	680	451	217
Grp Sat Flow(s),veh/h/ln	1755	1729	1612	1755	1805	1610	1755	1729	1585	1755	1805	1611
Q Serve(g_s), s	10.0	27.8	4.8	5.3	25.4	33.0	4.1	12.7	12.8	14.0	10.9	11.9
Cycle Q Clear(g_c), s	10.0	27.8	4.8	5.3	25.4	33.0	4.1	12.7	12.8	14.0	10.9	11.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	310	1792	557	227	1162	518	187	1317	402	434	1170	522
V/C Ratio(X)	1.05	0.79	0.18	0.73	0.77	0.93	0.69	0.51	0.52	1.57	0.39	0.42
Avail Cap(c_a), veh/h	310	1792	557	403	1213	541	248	1559	476	434	1276	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	33.3	25.8	51.9	34.6	37.2	52.6	36.2	36.3	49.6	29.5	29.9
Incr Delay (d2), s/veh	65.9	2.8	0.3	1.7	3.7	24.0	2.6	0.7	2.2	265.4	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	13.7	2.2	2.6	13.2	18.1	2.1	6.2	5.8	22.8	5.5	5.4
LnGrp Delay(d),s/veh	117.5	36.2	26.1	53.7	38.3	61.2	55.3	36.9	38.5	314.9	30.0	31.0
LnGrp LOS	F	D	C	D	D	E	E	D	D	F	C	C
Approach Vol, veh/h		1840			1550			1016			1348	
Approach Delay, s/veh		50.1			47.1			39.6			173.9	
Approach LOS		D			D			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	46.1	11.0	43.7	15.0	43.4	19.0	35.7
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	13.0	35.0	8.0	40.0	10.0	38.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	7.3	29.8	6.1	13.9	12.0	35.0	16.0	14.8
Green Ext Time (p_c), s	0.1	5.2	0.0	17.2	0.0	1.5	0.0	13.7

Intersection Summary	
HCM 2010 Ctrl Delay	76.4
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1960	786	1057	1483	424	0	237
Future Volume (vph)	1960	786	1057	1483	424	0	237
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	36.5	23.5	23.5	23.5
Total Split (s)	52.5	52.5	34.0	86.5	23.5	23.5	23.5
Total Split (%)	47.7%	47.7%	30.9%	78.6%	21.4%	21.4%	21.4%
Yellow Time (s)	4.5	4.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	Min	Min	Min

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 59 (54%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1960	786	1057	1483	0	0	0	0	424	0	237
Future Volume (veh/h)	0	1960	786	1057	1483	0	0	0	0	424	0	237
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	2154	863	1162	1630	0				516	0	107
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1559	689	941	2675	0				576	0	257
Arrive On Green	0.00	0.43	0.43	0.18	0.50	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	3705	1595	3510	3705	0				3619	0	1615
Grp Volume(v), veh/h	0	2154	863	1162	1630	0				516	0	107
Grp Sat Flow(s),veh/h/ln	0	1805	1595	1755	1805	0				1810	0	1615
Q Serve(g_s), s	0.0	47.5	47.5	29.5	35.9	0.0				15.4	0.0	6.6
Cycle Q Clear(g_c), s	0.0	47.5	47.5	29.5	35.9	0.0				15.4	0.0	6.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1559	689	941	2675	0				576	0	257
V/C Ratio(X)	0.00	1.38	1.25	1.23	0.61	0.00				0.90	0.00	0.42
Avail Cap(c_a), veh/h	0	1559	689	941	2675	0				592	0	264
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.2	31.2	45.1	16.2	0.0				45.4	0.0	41.7
Incr Delay (d2), s/veh	0.0	172.2	115.1	106.3	0.1	0.0				15.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	60.9	42.9	28.2	17.8	0.0				8.9	0.0	3.0
LnGrp Delay(d),s/veh	0.0	203.4	146.4	151.4	16.3	0.0				60.8	0.0	42.1
LnGrp LOS		F	F	F	B					E		D
Approach Vol, veh/h		3017			2792						623	
Approach Delay, s/veh		187.1			72.5						57.6	
Approach LOS		F			E						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	34.0	53.0		23.0		87.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	29.5	47.0		18.0		81.0		
Max Q Clear Time (g_c+I1), s	31.5	49.5		17.4		37.9		
Green Ext Time (p_c), s	0.0	0.0		0.1		36.8		

Intersection Summary	
HCM 2010 Ctrl Delay	124.8
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	387	1997	1944	413	596	0	654
Future Volume (vph)	387	1997	1944	413	596	0	654
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	36.0	86.0	50.0	50.0	24.0	24.0	24.0
Total Split (%)	32.7%	78.2%	45.5%	45.5%	21.8%	21.8%	21.8%
Yellow Time (s)	4.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	387	1997	0	0	1944	413	596	0	654	0	0	0
Future Volume (veh/h)	387	1997	0	0	1944	413	596	0	654	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	430	2219	0	0	2160	399	813	0	324			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	523	2642	0	0	1956	863	609	0	272			
Arrive On Green	0.15	0.73	0.00	0.00	0.54	0.54	0.17	0.00	0.17			
Sat Flow, veh/h	3510	3705	0	0	3705	1594	3619	0	1615			
Grp Volume(v), veh/h	430	2219	0	0	2160	399	813	0	324			
Grp Sat Flow(s),veh/h/ln	1755	1805	0	0	1805	1594	1810	0	1615			
Q Serve(g_s), s	13.1	47.1	0.0	0.0	59.6	16.8	18.5	0.0	18.5			
Cycle Q Clear(g_c), s	13.1	47.1	0.0	0.0	59.6	16.8	18.5	0.0	18.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	523	2642	0	0	1956	863	609	0	272			
V/C Ratio(X)	0.82	0.84	0.00	0.00	1.10	0.46	1.34	0.00	1.19			
Avail Cap(c_a), veh/h	1005	2642	0	0	1956	863	609	0	272			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	45.4	10.3	0.0	0.0	25.2	15.4	45.8	0.0	45.8			
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	55.2	1.8	162.0	0.0	117.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.4	22.9	0.0	0.0	44.6	7.9	22.9	0.0	17.1			
LnGrp Delay(d),s/veh	45.7	10.6	0.0	0.0	80.4	17.2	207.8	0.0	162.9			
LnGrp LOS	D	B			F	B	F		F			
Approach Vol, veh/h		2649			2559			1137				
Approach Delay, s/veh		16.3			70.6			195.0				
Approach LOS		B			E			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		86.0			20.9	65.1		24.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		80.5			31.5	44.5		18.5
Max Q Clear Time (g_c+I1), s		49.1			15.1	61.6		20.5
Green Ext Time (p_c), s		29.1			1.3	0.0		0.0

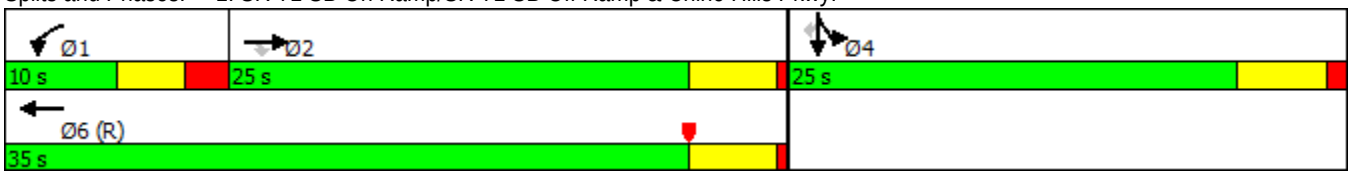
Intersection Summary	
HCM 2010 Ctrl Delay	70.2
HCM 2010 LOS	E

Notes

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1485	630	119	1221	562	308	686
Future Volume (vph)	1485	630	119	1221	562	308	686
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	20.5	20.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.34	0.34	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.70	0.91	0.88	0.70	0.83	0.79	1.17
Control Delay	19.1	31.8	70.6	10.6	34.8	30.2	113.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	31.8	70.6	10.6	34.8	30.2	113.7
LOS	B	C	E	B	C	C	F
Approach Delay	22.9			15.9		68.2	
Approach LOS	C			B		E	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 94.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1485	630	119	1221	0	0	0	0	562	308	686
Future Volume (veh/h)	0	1485	630	119	1221	0	0	0	0	562	308	686
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0				1800	1900	1900
Adj Flow Rate, veh/h	0	1563	537	125	1285	0				458	512	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2233	544	143	1835	0				571	633	538
Arrive On Green	0.00	0.34	0.34	0.17	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6802	1591	1714	3705	0				1714	1900	1615
Grp Volume(v), veh/h	0	1563	537	125	1285	0				458	512	0
Grp Sat Flow(s),veh/h/ln	0	1634	1591	1714	1805	0				1714	1900	1615
Q Serve(g_s), s	0.0	12.4	20.1	4.3	0.0	0.0				14.6	14.8	0.0
Cycle Q Clear(g_c), s	0.0	12.4	20.1	4.3	0.0	0.0				14.6	14.8	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2233	544	143	1835	0				571	633	538
V/C Ratio(X)	0.00	0.70	0.99	0.87	0.70	0.00				0.80	0.81	0.00
Avail Cap(c_a), veh/h	0	2233	544	143	1835	0				571	633	538
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.52	0.52	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	17.1	19.6	24.7	0.0	0.0				18.2	18.3	0.0
Incr Delay (d2), s/veh	0.0	1.0	35.4	24.5	1.2	0.0				11.3	10.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.7	14.1	3.0	0.3	0.0				8.7	9.6	0.0
LnGrp Delay(d),s/veh	0.0	18.1	55.0	49.2	1.2	0.0				29.5	28.9	0.0
LnGrp LOS		B	E	D	A					C	C	
Approach Vol, veh/h		2100			1410						970	
Approach Delay, s/veh		27.5			5.4						29.2	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	10.0	25.0		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	6.3	22.1		16.8		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.2		24.9		

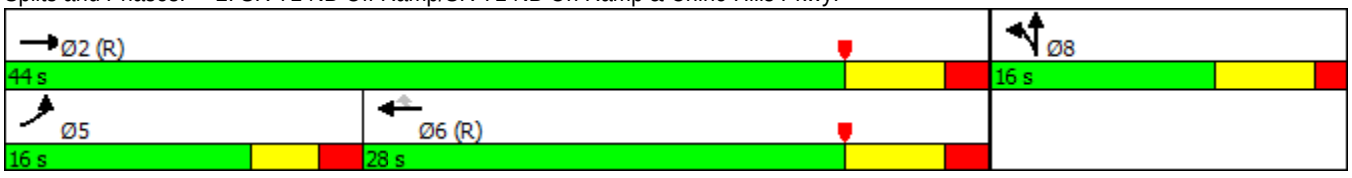
Intersection Summary	
HCM 2010 Ctrl Delay	20.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	561	1486	793	729	548	175
Future Volume (vph)	561	1486	793	729	548	175
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	37.5	21.5	21.5	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	1.05	0.71	0.66	1.18	1.16	1.05
Control Delay	70.2	20.1	19.2	116.8	134.2	76.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	70.2	20.1	19.2	116.8	134.2	76.8
LOS	E	C	B	F	F	E
Approach Delay		33.8	65.9			96.0
Approach LOS		C	E			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 56.7	Intersection LOS: E
Intersection Capacity Utilization 94.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	561	1486	0	0	793	729	548	175	114	0	0	0
Future Volume (veh/h)	561	1486	0	0	793	729	548	175	114	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1900	0	0	1900	1900	1800	1900	1900			
Adj Flow Rate, veh/h	603	1598	0	0	853	781	589	188	119			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	576	2256	0	0	1294	570	571	182	115			
Arrive On Green	0.18	0.63	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	3141	3705	0	0	3705	1592	3429	1089	689			
Grp Volume(v), veh/h	603	1598	0	0	853	781	589	0	307			
Grp Sat Flow(s),veh/h/ln	1570	1805	0	0	1805	1592	1714	0	1778			
Q Serve(g_s), s	11.0	17.9	0.0	0.0	11.9	21.5	10.0	0.0	10.0			
Cycle Q Clear(g_c), s	11.0	17.9	0.0	0.0	11.9	21.5	10.0	0.0	10.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.39			
Lane Grp Cap(c), veh/h	576	2256	0	0	1294	570	571	0	296			
V/C Ratio(X)	1.05	0.71	0.00	0.00	0.66	1.37	1.03	0.00	1.04			
Avail Cap(c_a), veh/h	576	2256	0	0	1294	570	571	0	296			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.61	0.61	0.00	0.00	0.23	0.23	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.5	7.6	0.0	0.0	16.2	19.3	25.0	0.0	25.0			
Incr Delay (d2), s/veh	42.4	1.2	0.0	0.0	0.6	168.7	45.8	0.0	61.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.1	9.0	0.0	0.0	6.0	36.1	8.3	0.0	10.0			
LnGrp Delay(d),s/veh	66.9	8.7	0.0	0.0	16.8	188.0	70.8	0.0	86.9			
LnGrp LOS	F	A			B	F	F		F			
Approach Vol, veh/h		2201			1634			896				
Approach Delay, s/veh		24.7			98.6			76.3				
Approach LOS		C			F			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			16.0	28.0		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		19.9			13.0	23.5		12.0
Green Ext Time (p_c), s		15.8			0.0	0.0		0.0

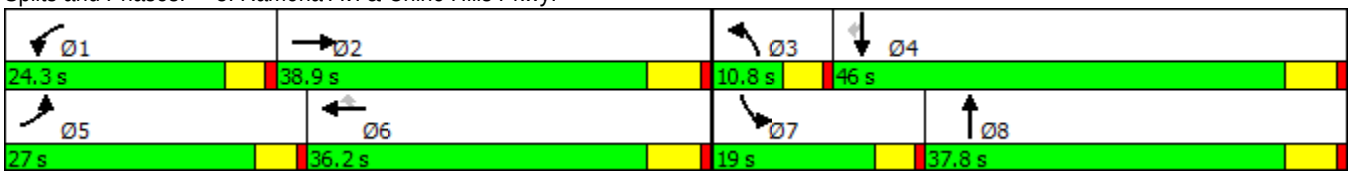
Intersection Summary	
HCM 2010 Ctrl Delay	60.0
HCM 2010 LOS	E

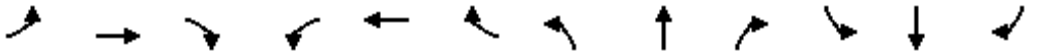
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	329	1268	163	959	154	29	468	204	435	534
Future Volume (vph)	329	1268	163	959	154	29	468	204	435	534
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	22.4	37.0	15.8	30.4	30.4	5.8	32.0	14.4	44.5	44.5
Actuated g/C Ratio	0.19	0.31	0.13	0.25	0.25	0.05	0.27	0.12	0.37	0.37
v/c Ratio	1.10	0.85	0.77	1.12	0.31	0.37	0.76	1.06	0.35	0.66
Control Delay	124.6	45.4	72.1	108.5	7.0	68.2	43.0	129.7	29.1	11.6
Queue Delay	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	124.6	50.6	72.1	108.5	7.0	68.2	43.0	129.7	29.1	11.6
LOS	F	D	E	F	A	E	D	F	C	B
Approach Delay		65.8		91.6			44.0		38.6	
Approach LOS		E		F			D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 62.8	Intersection LOS: E
Intersection Capacity Utilization 101.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	1268	3	163	959	154	29	468	216	204	435	534
Future Volume (veh/h)	329	1268	3	163	959	154	29	468	216	204	435	534
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	350	1349	3	173	1020	119	31	498	175	217	463	458
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	320	1729	4	199	915	404	46	697	243	206	1299	572
Arrive On Green	0.19	0.32	0.32	0.12	0.25	0.25	0.03	0.27	0.27	0.12	0.36	0.36
Sat Flow, veh/h	1714	5344	12	1714	3610	1593	1714	2614	913	1714	3610	1591
Grp Volume(v), veh/h	350	873	479	173	1020	119	31	343	330	217	463	458
Grp Sat Flow(s),veh/h/ln	1714	1729	1898	1714	1805	1593	1714	1805	1722	1714	1805	1591
Q Serve(g_s), s	22.4	27.4	27.4	11.9	30.4	7.2	2.2	20.6	20.9	14.4	11.3	31.1
Cycle Q Clear(g_c), s	22.4	27.4	27.4	11.9	30.4	7.2	2.2	20.6	20.9	14.4	11.3	31.1
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	320	1119	614	199	915	404	46	481	459	206	1299	572
V/C Ratio(X)	1.09	0.78	0.78	0.87	1.12	0.29	0.67	0.71	0.72	1.05	0.36	0.80
Avail Cap(c_a), veh/h	320	1119	614	281	915	404	89	481	459	206	1299	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.8	36.7	36.7	52.1	44.8	36.2	57.9	39.8	39.9	52.8	28.2	34.5
Incr Delay (d2), s/veh	77.8	3.8	6.8	13.9	66.7	0.6	6.2	8.7	9.3	78.0	0.8	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.5	13.7	15.5	6.4	23.6	3.3	1.1	11.4	11.1	11.3	5.8	15.4
LnGrp Delay(d),s/veh	126.6	40.5	43.5	66.0	111.5	36.7	64.1	48.5	49.3	130.8	29.0	45.7
LnGrp LOS	F	D	D	E	F	D	E	D	D	F	C	D
Approach Vol, veh/h		1702			1312			704			1138	
Approach Delay, s/veh		59.1			98.7			49.6			55.1	
Approach LOS		E			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.6	44.6	7.8	49.0	27.0	36.2	19.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	13.9	29.4	4.2	33.1	24.4	32.4	16.4	22.9
Green Ext Time (p_c), s	0.1	3.5	0.0	4.5	0.0	0.0	0.0	5.4

Intersection Summary	
HCM 2010 Ctrl Delay	67.5
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	12.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1192	160	59	1092	166	45
Future Vol, veh/h	1192	160	59	1092	166	45
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1324	178	66	1213	184	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1327	0	2065	665
Stage 1	-	-	-	-	1327	-
Stage 2	-	-	-	-	738	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	527	-	~ 48	407
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	439	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	527	-	~ 42	406
Mov Cap-2 Maneuver	-	-	-	-	~ 180	-
Stage 1	-	-	-	-	215	-
Stage 2	-	-	-	-	384	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	157.5
HCM LOS			F

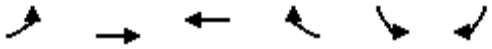
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	204	-	-	527	-
HCM Lane V/C Ratio	1.149	-	-	0.124	-
HCM Control Delay (s)	157.5	-	-	12.8	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	11.5	-	-	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	213	1024	842	107	310
Future Volume (vph)	213	1024	842	107	310
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	18.3	64.1	41.1	23.7	43.2
Actuated g/C Ratio	0.18	0.64	0.41	0.24	0.43
v/c Ratio	0.74	0.48	0.78	0.16	0.46
Control Delay	54.5	9.5	29.2	35.0	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	9.5	29.2	35.0	16.9
LOS	D	A	C	D	B
Approach Delay		17.2	29.2	21.5	
Approach LOS		B	C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 99.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	213	1024	842	207	107	310
Future Volume (veh/h)	213	1024	842	207	107	310
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1900	1700	1900
Adj Flow Rate, veh/h	232	1113	915	223	116	151
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	264	2391	1329	323	707	612
Arrive On Green	0.15	0.66	0.46	0.46	0.23	0.23
Sat Flow, veh/h	1714	3705	2961	698	3141	1615
Grp Volume(v), veh/h	232	1113	576	562	116	151
Grp Sat Flow(s),veh/h/ln	1714	1805	1805	1759	1570	1615
Q Serve(g_s), s	13.6	15.5	25.9	26.0	3.1	6.6
Cycle Q Clear(g_c), s	13.6	15.5	25.9	26.0	3.1	6.6
Prop In Lane	1.00			0.40	1.00	1.00
Lane Grp Cap(c), veh/h	264	2391	837	815	707	612
V/C Ratio(X)	0.88	0.47	0.69	0.69	0.16	0.25
Avail Cap(c_a), veh/h	472	2985	914	891	707	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	8.5	21.8	21.8	32.1	21.9
Incr Delay (d2), s/veh	3.7	0.2	2.3	2.4	0.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	7.8	13.3	13.0	1.4	7.2
LnGrp Delay(d),s/veh	46.4	8.7	24.0	24.1	32.6	22.9
LnGrp LOS	D	A	C	C	C	C
Approach Vol, veh/h		1345	1138		267	
Approach Delay, s/veh		15.2	24.1		27.1	
Approach LOS		B	C		C	

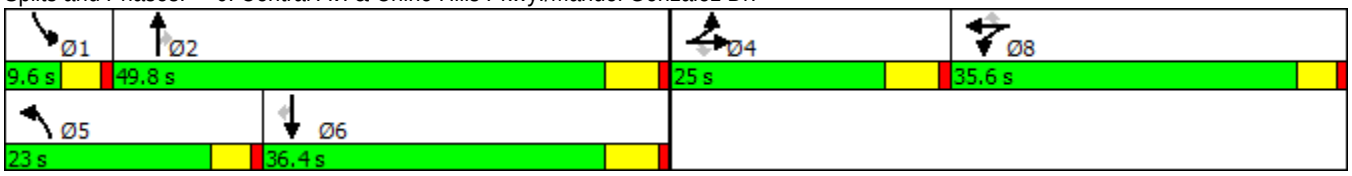
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		74.1		29.0	20.5	53.6		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		17.5		8.6	15.6	28.0		
Green Ext Time (p_c), s		42.0		0.7	0.2	19.8		

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	634	2	518	13	48	38	383	1262	1	12	1080	250
Future Volume (vph)	634	2	518	13	48	38	383	1262	1	12	1080	250
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	1.10	1.04	0.73	0.06	0.20	0.12	1.31	0.72	0.00	0.15	1.05	0.46
Control Delay	119.0	102.4	10.1	37.7	40.5	0.7	196.5	24.0	0.0	54.3	77.4	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.0	102.4	10.1	37.7	40.5	0.7	196.5	24.0	0.0	54.3	77.4	16.6
LOS	F	F	B	D	D	A	F	C	A	D	E	B
Approach Delay		65.5			24.9			64.1			65.9	
Approach LOS		E			C			E			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 64.1	Intersection LOS: E
Intersection Capacity Utilization 91.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	634	2	518	13	48	38	383	1262	1	12	1080	250
Future Volume (veh/h)	634	2	518	13	48	38	383	1262	1	12	1080	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	690	0	435	14	52	24	416	1372	1	13	1174	202
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	667	0	314	169	188	159	319	1736	776	26	1119	494
Arrive On Green	0.19	0.00	0.19	0.10	0.10	0.10	0.19	0.48	0.48	0.02	0.31	0.31
Sat Flow, veh/h	3429	0	1615	1714	1900	1605	1714	3610	1613	1714	3610	1593
Grp Volume(v), veh/h	690	0	435	14	52	24	416	1372	1	13	1174	202
Grp Sat Flow(s),veh/h/ln	1714	0	1615	1714	1900	1605	1714	1805	1613	1714	1805	1593
Q Serve(g_s), s	19.2	0.0	19.2	0.7	2.5	1.4	18.4	31.4	0.0	0.7	30.6	9.9
Cycle Q Clear(g_c), s	19.2	0.0	19.2	0.7	2.5	1.4	18.4	31.4	0.0	0.7	30.6	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	667	0	314	169	188	159	319	1736	776	26	1119	494
V/C Ratio(X)	1.04	0.00	1.39	0.08	0.28	0.15	1.30	0.79	0.00	0.50	1.05	0.41
Avail Cap(c_a), veh/h	667	0	314	538	596	504	319	1736	776	87	1119	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	0.0	39.8	40.4	41.2	40.7	40.2	21.5	13.3	48.3	34.1	26.9
Incr Delay (d2), s/veh	44.2	0.0	192.0	0.2	0.8	0.4	157.1	3.8	0.0	5.4	40.9	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.1	0.0	25.3	0.4	1.4	0.6	22.5	16.5	0.0	0.4	21.4	4.7
LnGrp Delay(d),s/veh	84.0	0.0	231.8	40.6	42.0	41.1	197.3	25.2	13.3	53.7	75.0	29.4
LnGrp LOS	F		F	D	D	D	F	C	B	D	F	C
Approach Vol, veh/h		1125			90			1789			1389	
Approach Delay, s/veh		141.2			41.6			65.2			68.1	
Approach LOS		F			D			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	53.3		25.0	23.0	36.4		14.4
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	33.4		21.2	20.4	32.6		4.5
Green Ext Time (p_c), s	0.0	10.0		0.0	0.0	0.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	85.1
HCM 2010 LOS	F

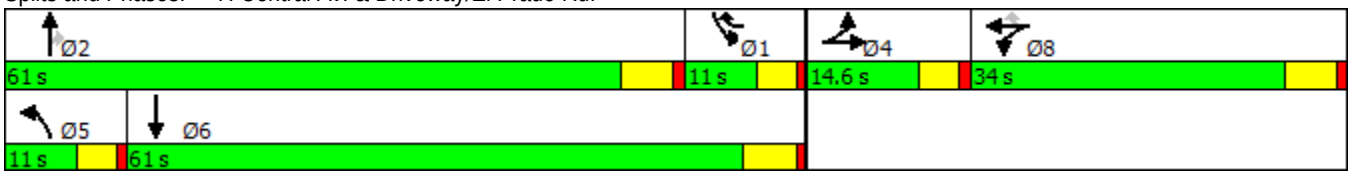
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	30	6	602	5	398	10	1022	597	393	1018
Future Volume (vph)	30	6	602	5	398	10	1022	597	393	1018
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	34.0	34.0	11.0	11.0	61.0	61.0	11.0	61.0
Total Split (%)	12.1%	12.1%	28.2%	28.2%	9.1%	9.1%	50.6%	50.6%	9.1%	50.6%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.1	10.1	25.2	25.2	33.9	5.5	55.7	55.7	6.5	64.7
Actuated g/C Ratio	0.09	0.09	0.22	0.22	0.30	0.05	0.49	0.49	0.06	0.56
v/c Ratio	0.21	0.18	0.88	0.85	0.71	0.12	0.61	0.57	4.26	0.37
Control Delay	55.2	25.9	69.9	64.4	27.9	58.3	24.9	3.8	1513.1	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	25.9	69.9	64.4	27.9	58.3	24.9	3.8	1513.1	16.0
LOS	E	C	E	E	C	E	C	A	F	B
Approach Delay		40.8		51.6			17.4			426.9
Approach LOS		D		D			B			F

Intersection Summary

Cycle Length: 120.6
Actuated Cycle Length: 114.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 4.26
Intersection Signal Delay: 168.1 — Intersection LOS: F
Intersection Capacity Utilization 89.0% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	6	23	602	5	398	10	1022	597	393	1018	20
Future Volume (veh/h)	30	6	23	602	5	398	10	1022	597	393	1018	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	31	6	15	631	0	264	10	1065	446	409	1060	17
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	34	84	721	0	429	20	1715	757	94	2779	45
Arrive On Green	0.07	0.07	0.07	0.21	0.00	0.21	0.01	0.48	0.48	0.06	0.53	0.53
Sat Flow, veh/h	1714	482	1205	3429	0	1615	1714	3610	1594	1714	5257	84
Grp Volume(v), veh/h	31	0	21	631	0	264	10	1065	446	409	697	380
Grp Sat Flow(s),veh/h/ln	1714	0	1687	1714	0	1615	1714	1805	1594	1714	1729	1883
Q Serve(g_s), s	2.0	0.0	1.4	20.7	0.0	10.3	0.7	25.5	23.7	6.4	13.8	13.8
Cycle Q Clear(g_c), s	2.0	0.0	1.4	20.7	0.0	10.3	0.7	25.5	23.7	6.4	13.8	13.8
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	120	0	118	721	0	429	20	1715	757	94	1828	996
V/C Ratio(X)	0.26	0.00	0.18	0.87	0.00	0.62	0.49	0.62	0.59	4.33	0.38	0.38
Avail Cap(c_a), veh/h	148	0	145	832	0	481	94	1715	757	94	1828	996
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.2	0.0	50.9	44.4	0.0	37.5	57.0	22.7	22.2	54.9	16.2	16.2
Incr Delay (d2), s/veh	0.4	0.0	0.3	9.3	0.0	1.9	6.7	1.7	3.3	1523.2	0.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.6	10.7	0.0	6.8	0.4	13.1	11.1	43.0	6.7	7.5
LnGrp Delay(d),s/veh	51.6	0.0	51.1	53.7	0.0	39.4	63.7	24.4	25.6	1578.1	16.8	17.3
LnGrp LOS	D		D	D		D	E	C	C	F	B	B
Approach Vol, veh/h		52			895			1521			1486	
Approach Delay, s/veh		51.4			49.5			25.0			446.6	
Approach LOS		D			D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.2	61.0		12.7	6.0	67.2		30.2
Change Period (Y+Rc), s	5.8	* 5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	6.4	* 55		10.0	6.4	55.2		28.2
Max Q Clear Time (g_c+I1), s	8.4	27.5		4.0	2.7	15.8		22.7
Green Ext Time (p_c), s	0.0	14.5		0.0	0.0	12.1		1.7

Intersection Summary		
HCM 2010 Ctrl Delay	189.3	
HCM 2010 LOS	F	

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1216	948	202
Future Volume (vph)	1216	948	202
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	75.0	75.0	45.0
Total Split (%)	62.5%	62.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	73.4	73.4	37.1
Actuated g/C Ratio	0.61	0.61	0.31
v/c Ratio	0.40	0.31	1.33dr
Control Delay	17.9	11.9	52.6
Queue Delay	0.0	0.0	0.0
Total Delay	17.9	11.9	52.6
LOS	B	B	D
Approach Delay	17.9	11.9	52.6
Approach LOS	B	B	D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 25.9	Intersection LOS: C
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1216	0	0	948	202	661
Future Volume (veh/h)	1216	0	0	948	202	661
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	0	1900	1800	1900
Adj Flow Rate, veh/h	1280	0	0	998	213	535
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	3047	0	0	3047	571	538
Arrive On Green	1.00	0.00	0.00	0.59	0.33	0.33
Sat Flow, veh/h	5529	0	0	5529	1714	1615
Grp Volume(v), veh/h	1280	0	0	998	213	535
Grp Sat Flow(s),veh/h/ln	1729	0	0	1729	1714	1615
Q Serve(g_s), s	0.0	0.0	0.0	11.8	11.4	39.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	11.8	11.4	39.6
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	3047	0	0	3047	571	538
V/C Ratio(X)	0.42	0.00	0.00	0.33	0.37	0.99
Avail Cap(c_a), veh/h	3047	0	0	3047	571	538
HCM Platoon Ratio	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	12.6	30.5	39.9
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.3	0.2	37.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	5.7	5.4	23.2
LnGrp Delay(d),s/veh	0.4	0.0	0.0	12.9	30.6	77.0
LnGrp LOS	A			B	C	E
Approach Vol, veh/h	1280			998	748	
Approach Delay, s/veh	0.4			12.9	63.8	
Approach LOS	A			B	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		75.0				75.0		45.0
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		70.5				70.5		40.0
Max Q Clear Time (g_c+I1), s		2.0				13.8		41.6
Green Ext Time (p_c), s		15.9				15.6		0.0

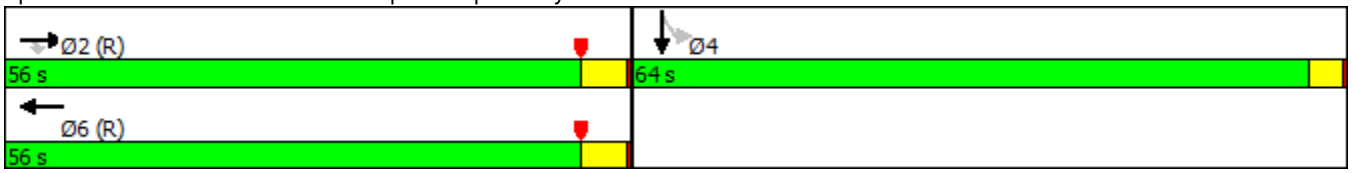
Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1350	113	566	473	0
Future Volume (vph)	1350	113	566	473	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	56.0	56.0	56.0	64.0	64.0
Total Split (%)	46.7%	46.7%	46.7%	53.3%	53.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	51.5	51.5	51.5	60.5	60.5
Actuated g/C Ratio	0.43	0.43	0.43	0.50	0.50
v/c Ratio	0.61	0.15	0.26	0.53	1.22
Control Delay	28.0	4.2	15.7	23.0	132.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	4.2	15.7	23.0	132.5
LOS	C	A	B	C	F
Approach Delay	26.2		15.7		100.9
Approach LOS	C		B		F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 55.9	Intersection LOS: E
Intersection Capacity Utilization 77.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	✣	
Traffic Volume (veh/h)	0	1350	113	0	566	0	0	0	0	473	0	1003
Future Volume (veh/h)	0	1350	113	0	566	0	0	0	0	473	0	1003
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	0				1800	1900	1900
Adj Flow Rate, veh/h	0	1364	0	0	572	0				478	0	887
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2226	693	0	2226	0				864	0	814
Arrive On Green	0.00	0.43	0.00	0.00	0.86	0.00				0.50	0.00	0.50
Sat Flow, veh/h	0	5358	1615	0	5529	0				1714	0	1615
Grp Volume(v), veh/h	0	1364	0	0	572	0				478	0	887
Grp Sat Flow(s),veh/h/ln	0	1729	1615	0	1729	0				1714	0	1615
Q Serve(g_s), s	0.0	24.4	0.0	0.0	2.4	0.0				23.0	0.0	60.5
Cycle Q Clear(g_c), s	0.0	24.4	0.0	0.0	2.4	0.0				23.0	0.0	60.5
Prop In Lane	0.00		1.00	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2226	693	0	2226	0				864	0	814
V/C Ratio(X)	0.00	0.61	0.00	0.00	0.26	0.00				0.55	0.00	1.09
Avail Cap(c_a), veh/h	0	2226	693	0	2226	0				864	0	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.5	0.0	0.0	5.0	0.0				20.5	0.0	29.8
Incr Delay (d2), s/veh	0.0	1.3	0.0	0.0	0.3	0.0				0.5	0.0	58.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.9	0.0	0.0	1.1	0.0				11.0	0.0	40.0
LnGrp Delay(d),s/veh	0.0	27.8	0.0	0.0	5.3	0.0				20.9	0.0	88.4
LnGrp LOS		C			A					C		F
Approach Vol, veh/h		1364			572						1365	
Approach Delay, s/veh		27.8			5.3						64.8	
Approach LOS		C			A						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		56.0		64.0		56.0		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		51.5		60.5		51.5		
Max Q Clear Time (g_c+I1), s		26.4		62.5		4.4		
Green Ext Time (p_c), s		12.3		0.0		15.6		

Intersection Summary	
HCM 2010 Ctrl Delay	39.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	40	10	4	794	5	76	105	895	54
Future Volume (vph)	40	10	4	794	5	76	105	895	54
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	30.8	30.8	16.2	40.0	9.6	33.0	33.0	40.0	63.4
Total Split (%)	25.7%	25.7%	13.5%	33.3%	8.0%	27.5%	27.5%	33.3%	52.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.9	12.9	10.5	45.6	5.2	11.0	11.0	37.0	42.1
Actuated g/C Ratio	0.15	0.15	0.13	0.55	0.06	0.13	0.13	0.44	0.50
v/c Ratio	0.16	0.08	0.32	0.68	0.05	0.32	0.35	1.24	0.04
Control Delay	34.7	22.6	43.0	4.3	44.4	41.6	9.7	147.8	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	22.6	43.0	4.3	44.4	41.6	9.7	147.8	12.4
LOS	C	C	D	A	D	D	A	F	B
Approach Delay		30.5	7.4			23.6			138.1
Approach LOS		C	A			C			F

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 83.5
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 70.3 — Intersection LOS: E
Intersection Capacity Utilization 81.0% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	10	10	66	4	794	5	76	105	895	54	15
Future Volume (veh/h)	40	10	10	66	4	794	5	76	105	895	54	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	42	11	9	69	4	385	5	80	110	942	57	15
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	155	88	72	202	12	864	101	224	190	715	1378	349
Arrive On Green	0.09	0.09	0.09	0.12	0.12	0.12	0.06	0.12	0.12	0.42	0.48	0.48
Sat Flow, veh/h	1714	968	792	1715	99	1615	1714	1900	1615	1714	2852	723
Grp Volume(v), veh/h	42	0	20	73	0	385	5	80	110	942	35	37
Grp Sat Flow(s),veh/h/ln	1714	0	1760	1814	0	1615	1714	1900	1615	1714	1805	1770
Q Serve(g_s), s	1.9	0.0	0.9	3.1	0.0	0.0	0.2	3.3	5.5	35.4	0.9	0.9
Cycle Q Clear(g_c), s	1.9	0.0	0.9	3.1	0.0	0.0	0.2	3.3	5.5	35.4	0.9	0.9
Prop In Lane	1.00		0.45	0.95		1.00	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	155	0	159	214	0	864	101	224	190	715	872	855
V/C Ratio(X)	0.27	0.00	0.13	0.34	0.00	0.45	0.05	0.36	0.58	1.32	0.04	0.04
Avail Cap(c_a), veh/h	529	0	543	214	0	864	101	622	529	715	1225	1201
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	0.0	35.5	34.4	0.0	12.1	37.7	34.5	35.4	24.7	11.6	11.6
Incr Delay (d2), s/veh	0.9	0.0	0.4	0.9	0.0	0.4	0.1	1.0	2.8	152.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.4	1.6	0.0	5.5	0.1	1.8	2.6	46.8	0.4	0.5
LnGrp Delay(d),s/veh	36.9	0.0	35.9	35.4	0.0	12.4	37.8	35.4	38.2	177.4	11.6	11.6
LnGrp LOS	D		D	D		B	D	D	D	F	B	B
Approach Vol, veh/h		62			458			195			1014	
Approach Delay, s/veh		36.6			16.1			37.1			165.7	
Approach LOS		D			B			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	41.2	15.2		12.3	9.6	46.8		16.2
Change Period (Y+Rc), s	5.8	* 5.2		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	35.4	* 28		26.2	5.0	57.6		10.0
Max Q Clear Time (g_c+I1), s	37.4	7.5		3.9	2.2	2.9		5.1
Green Ext Time (p_c), s	0.0	0.7		0.2	0.0	2.0		0.8

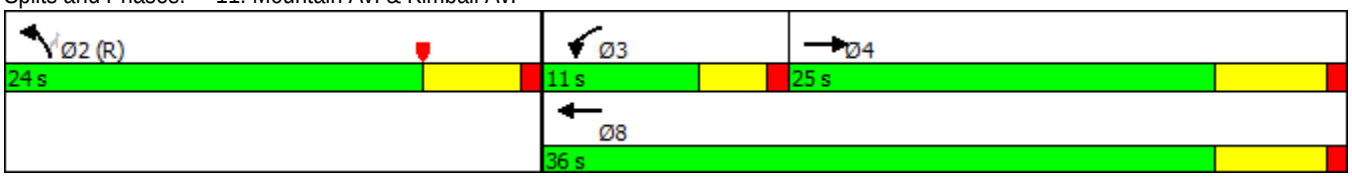
Intersection Summary		
HCM 2010 Ctrl Delay		106.9
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	974	84	844	56	116
Future Volume (vph)	974	84	844	56	116
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	25.0	11.0	36.0	24.0	24.0
Total Split (%)	41.7%	18.3%	60.0%	40.0%	40.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	22.6	7.4	31.9	16.8	16.8
Actuated g/C Ratio	0.38	0.12	0.53	0.28	0.28
v/c Ratio	0.83	0.43	0.48	0.13	0.23
Control Delay	24.7	31.2	9.7	18.8	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	31.2	9.7	18.8	5.3
LOS	C	C	A	B	A
Approach Delay	24.7		11.6	9.8	
Approach LOS	C		B	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 18.7 (31%), Referenced to phase 2:NBL and 6:, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	974	46	84	844	56	116
Future Volume (veh/h)	974	46	84	844	56	116
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1070	49	92	927	62	104
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1113	51	157	1714	577	544
Arrive On Green	0.32	0.32	0.09	0.47	0.34	0.34
Sat Flow, veh/h	3611	161	1714	3705	1714	1615
Grp Volume(v), veh/h	549	570	92	927	62	104
Grp Sat Flow(s),veh/h/ln	1805	1872	1714	1805	1714	1615
Q Serve(g_s), s	17.9	17.9	3.1	10.9	1.5	2.7
Cycle Q Clear(g_c), s	17.9	17.9	3.1	10.9	1.5	2.7
Prop In Lane		0.09	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	572	593	157	1714	577	544
V/C Ratio(X)	0.96	0.96	0.59	0.54	0.11	0.19
Avail Cap(c_a), veh/h	572	593	200	1805	577	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.85	0.85	1.00	1.00
Uniform Delay (d), s/veh	20.1	20.1	26.2	11.1	13.7	14.1
Incr Delay (d2), s/veh	5.0	4.9	1.1	0.1	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	10.0	1.5	5.4	0.8	1.3
LnGrp Delay(d),s/veh	25.2	25.1	27.3	11.2	14.1	14.9
LnGrp LOS	C	C	C	B	B	B
Approach Vol, veh/h	1119			1019	166	
Approach Delay, s/veh	25.1			12.7	14.6	
Approach LOS	C			B	B	

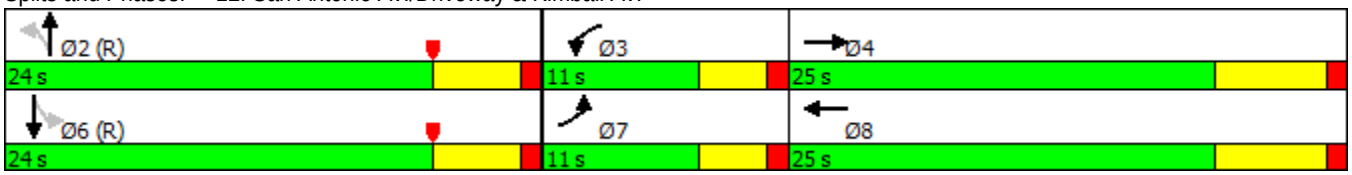
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		25.5	9.5	25.0				34.5
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		18.7	7.0	19.0				30.0
Max Q Clear Time (g_c+I1), s		4.7	5.1	19.9				12.9
Green Ext Time (p_c), s		0.1	0.0	0.0				5.9

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	1014	14	873	77	0		
Future Volume (vph)	1014	14	873	77	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	25.0	11.0	25.0	24.0	24.0	24.0	11.0
Total Split (%)	41.7%	18.3%	41.7%	40.0%	40.0%	40%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	22.2	7.0	24.4	24.7	24.7		
Actuated g/C Ratio	0.37	0.12	0.41	0.41	0.41		
v/c Ratio	0.83	0.08	0.63	0.14	0.05		
Control Delay	21.6	24.6	15.9	13.8	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	21.6	24.6	15.9	13.8	0.1		
LOS	C	C	B	B	A		
Approach Delay	21.6		16.0		9.4		
Approach LOS	C		B		A		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 19.1 (32%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1014	36	14	873	0	77	0	36	0	0	0
Future Volume (veh/h)	0	1014	36	14	873	0	77	0	36	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	1067	38	15	919	0	81	0	36	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	1126	40	44	1477	0	821	0	661	120	777	0
Arrive On Green	0.00	0.10	0.10	0.03	0.41	0.00	0.41	0.00	0.41	0.00	0.00	0.00
Sat Flow, veh/h	1714	3556	127	1714	3705	0	1714	0	1615	1394	1900	0
Grp Volume(v), veh/h	0	542	563	15	919	0	81	0	36	0	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1878	1714	1805	0	1714	0	1615	1394	1900	0
Q Serve(g_s), s	0.0	17.9	17.9	0.5	12.1	0.0	1.8	0.0	0.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	17.9	17.9	0.5	12.1	0.0	1.8	0.0	0.8	0.0	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	3	572	595	44	1477	0	821	0	661	120	777	0
V/C Ratio(X)	0.00	0.95	0.95	0.34	0.62	0.00	0.10	0.00	0.05	0.00	0.00	0.00
Avail Cap(c_a), veh/h	200	572	595	200	1477	0	821	0	661	120	777	0
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.55	0.55	0.83	0.83	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	26.4	26.4	28.7	14.1	0.0	11.0	0.0	10.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	16.7	16.3	1.4	0.5	0.0	0.2	0.0	0.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.6	12.0	0.3	6.1	0.0	0.9	0.0	0.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	43.1	42.6	30.1	14.6	0.0	11.2	0.0	10.9	0.0	0.0	0.0
LnGrp LOS		D	D	C	B		B		B			
Approach Vol, veh/h		1105			934			117			0	
Approach Delay, s/veh		42.8			14.8			11.1			0.0	
Approach LOS		D			B			B				

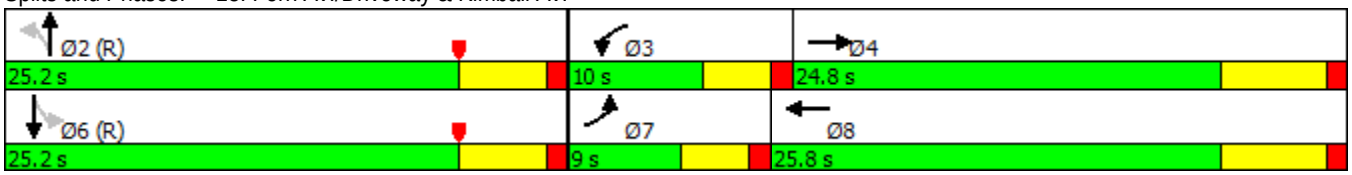
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		29.5	5.5	25.0		29.5	0.0	30.5
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		3.8	2.5	19.9		0.0	0.0	14.1
Green Ext Time (p_c), s		0.1	0.0	0.0		0.0	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	29.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1007	12	802	50	1	195	8
Future Volume (vph)	20	1007	12	802	50	1	195	8
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	24.8	10.0	25.8	25.2	25.2	25.2	25.2
Total Split (%)	15.0%	41.3%	16.7%	43.0%	42.0%	42.0%	42.0%	42.0%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	5.1	23.7	5.1	23.8	23.8	23.8	23.8	23.8
Actuated g/C Ratio	0.08	0.40	0.08	0.40	0.40	0.40	0.40	0.40
v/c Ratio	0.16	0.82	0.10	0.65	0.11	0.07	0.43	0.07
Control Delay	32.5	13.0	20.6	16.5	13.1	5.2	17.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	13.0	20.6	16.5	13.1	5.2	17.1	6.1
LOS	C	B	C	B	B	A	B	A
Approach Delay		13.4		16.6		9.5		15.1
Approach LOS		B		B		A		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 39 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1007	23	12	802	11	50	1	40	195	8	36
Future Volume (veh/h)	20	1007	23	12	802	11	50	1	40	195	8	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	23	1144	20	14	911	12	57	1	25	222	9	23
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	45	1155	20	30	1127	15	693	26	658	699	200	510
Arrive On Green	0.05	0.64	0.64	0.02	0.31	0.31	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1714	3629	63	1714	3647	48	1399	62	1562	1407	474	1212
Grp Volume(v), veh/h	23	569	595	14	451	472	57	0	26	222	0	32
Grp Sat Flow(s),veh/h/ln	1714	1805	1887	1714	1805	1890	1399	0	1624	1407	0	1686
Q Serve(g_s), s	0.8	18.6	18.6	0.5	13.8	13.8	1.5	0.0	0.6	6.6	0.0	0.7
Cycle Q Clear(g_c), s	0.8	18.6	18.6	0.5	13.8	13.8	2.2	0.0	0.6	7.2	0.0	0.7
Prop In Lane	1.00		0.03	1.00		0.03	1.00		0.96	1.00		0.72
Lane Grp Cap(c), veh/h	45	575	601	30	558	584	693	0	684	699	0	710
V/C Ratio(X)	0.51	0.99	0.99	0.47	0.81	0.81	0.08	0.00	0.04	0.32	0.00	0.05
Avail Cap(c_a), veh/h	143	575	601	171	605	633	693	0	684	699	0	710
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.45	0.45	0.45	0.23	0.23	0.23	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	10.8	10.8	29.2	19.1	19.1	10.9	0.0	10.2	12.3	0.0	10.3
Incr Delay (d2), s/veh	1.4	22.6	22.1	1.0	1.6	1.5	0.2	0.0	0.1	1.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	12.1	12.6	0.2	7.0	7.3	0.6	0.0	0.3	2.8	0.0	0.3
LnGrp Delay(d),s/veh	29.5	33.4	33.0	30.2	20.7	20.6	11.1	0.0	10.3	13.5	0.0	10.4
LnGrp LOS	C	C	C	C	C	C	B		B	B		B
Approach Vol, veh/h		1187			937			83			254	
Approach Delay, s/veh		33.1			20.8			10.9			13.1	
Approach LOS		C			C			B			B	

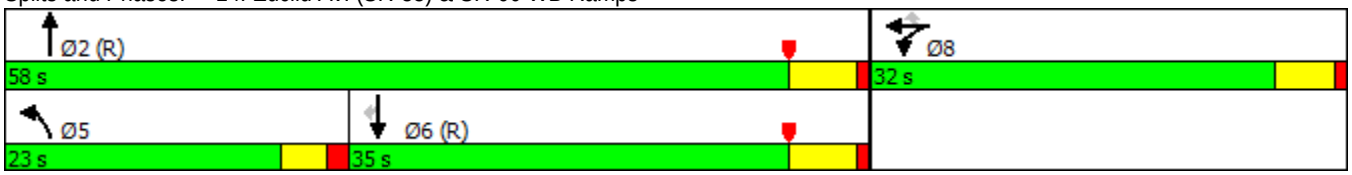
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		30.2	5.0	24.8		30.2	5.6	24.2
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.3	6.0	19.1		20.3	5.0	20.1
Max Q Clear Time (g_c+I1), s		4.2	2.5	20.6		9.2	2.8	15.8
Green Ext Time (p_c), s		0.4	0.0	0.0		0.3	0.0	2.5

Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	734	8	601	345	1629	1347	807
Future Volume (vph)	734	8	601	345	1629	1347	807
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	32.0	32.0	32.0	23.0	58.0	35.0	35.0
Total Split (%)	35.6%	35.6%	35.6%	25.6%	64.4%	38.9%	38.9%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	27.0	27.0	27.0	18.5	52.5	29.5	29.5
Actuated g/C Ratio	0.30	0.30	0.30	0.21	0.58	0.33	0.33
v/c Ratio	1.00	0.99	0.87	1.03	0.81	1.20	0.89
Control Delay	74.3	69.6	43.9	55.2	29.2	127.2	19.4
Queue Delay	0.0	0.0	0.0	0.0	48.3	0.4	0.0
Total Delay	74.3	69.6	43.9	55.2	77.5	127.7	19.4
LOS	E	E	D	E	E	F	B
Approach Delay		63.1			73.6	87.1	
Approach LOS		E			E	F	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 76.4	Intersection LOS: E
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	734	8	601	345	1629	0	0	1347	807
Future Volume (veh/h)	0	0	0	734	8	601	345	1629	0	0	1347	807
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1800	1900	1900	1800	1900	0	0	1900	1900
Adj Flow Rate, veh/h				925	0	322	363	1715	0	0	1418	849
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				996	0	463	352	2140	0	0	1217	526
Arrive On Green				0.29	0.00	0.29	0.27	0.79	0.00	0.00	0.34	0.34
Sat Flow, veh/h				3429	0	1594	1714	3705	0	0	3705	1561
Grp Volume(v), veh/h				925	0	322	363	1715	0	0	1418	849
Grp Sat Flow(s),veh/h/ln				1714	0	1594	1714	1805	0	0	1805	1561
Q Serve(g_s), s				23.6	0.0	16.2	18.5	24.6	0.0	0.0	30.4	30.4
Cycle Q Clear(g_c), s				23.6	0.0	16.2	18.5	24.6	0.0	0.0	30.4	30.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				996	0	463	352	2140	0	0	1217	526
V/C Ratio(X)				0.93	0.00	0.70	1.03	0.80	0.00	0.00	1.16	1.61
Avail Cap(c_a), veh/h				1029	0	478	352	2140	0	0	1217	526
HCM Platoon Ratio				1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.0	0.0	28.4	32.7	6.5	0.0	0.0	29.8	29.8
Incr Delay (d2), s/veh				13.5	0.0	3.4	22.9	0.3	0.0	0.0	83.4	284.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				13.0	0.0	7.5	10.9	11.7	0.0	0.0	29.2	54.6
LnGrp Delay(d),s/veh				44.5	0.0	31.8	55.6	6.8	0.0	0.0	113.3	314.3
LnGrp LOS				D		C	F	A			F	F
Approach Vol, veh/h					1247			2078			2267	
Approach Delay, s/veh					41.2			15.3			188.6	
Approach LOS					D			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		58.9			23.0	35.9		31.1
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		52.5			18.5	29.5		27.0
Max Q Clear Time (g_c+I1), s		26.6			20.5	32.4		25.6
Green Ext Time (p_c), s		25.5			0.0	0.0		0.6

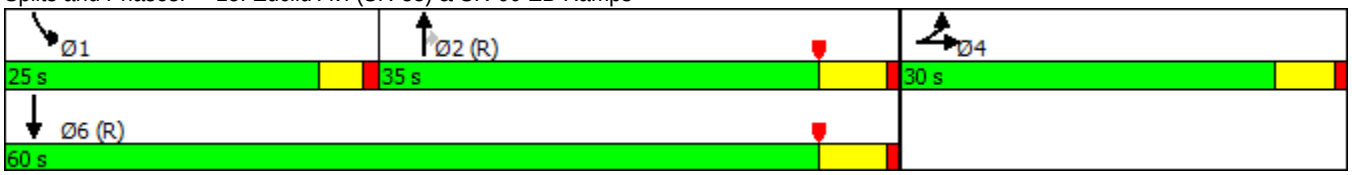
Intersection Summary	
HCM 2010 Ctrl Delay	91.3
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	592	2	1382	511	277	1804
Future Volume (vph)	592	2	1382	511	277	1804
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	30.0	30.0	35.0	35.0	25.0	60.0
Total Split (%)	33.3%	33.3%	38.9%	38.9%	27.8%	66.7%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	25.0	25.0	32.4	32.4	18.1	54.5
Actuated g/C Ratio	0.28	0.28	0.36	0.36	0.20	0.61
v/c Ratio	1.21	1.30	1.08	0.61	0.83	0.84
Control Delay	143.5	180.9	81.0	7.4	40.9	7.1
Queue Delay	179.1	90.6	6.9	0.0	0.0	43.6
Total Delay	322.6	271.5	87.9	7.4	40.9	50.6
LOS	F	F	F	A	D	D
Approach Delay		296.3	66.2			49.3
Approach LOS		F	E			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 109.2	Intersection LOS: F
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	592	2	506	0	0	0	0	1382	511	277	1804	0
Future Volume (veh/h)	592	2	506	0	0	0	0	1382	511	277	1804	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900				0	1900	1900	1800	1900	0
Adj Flow Rate, veh/h	523	116	439				0	1410	521	283	1841	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	476	97	366				0	1371	595	311	2186	0
Arrive On Green	0.28	0.28	0.28				0.00	0.38	0.38	0.36	1.00	0.00
Sat Flow, veh/h	1714	348	1319				0	3705	1568	1714	3705	0
Grp Volume(v), veh/h	523	0	555				0	1410	521	283	1841	0
Grp Sat Flow(s),veh/h/ln	1714	0	1667				0	1805	1568	1714	1805	0
Q Serve(g_s), s	25.0	0.0	25.0				0.0	34.2	27.8	14.1	0.0	0.0
Cycle Q Clear(g_c), s	25.0	0.0	25.0				0.0	34.2	27.8	14.1	0.0	0.0
Prop In Lane	1.00		0.79				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	476	0	463				0	1371	595	311	2186	0
V/C Ratio(X)	1.10	0.00	1.20				0.00	1.03	0.88	0.91	0.84	0.00
Avail Cap(c_a), veh/h	476	0	463				0	1371	595	400	2186	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.52	0.52	0.09	0.09	0.00
Uniform Delay (d), s/veh	32.5	0.0	32.5				0.0	27.9	25.9	28.0	0.0	0.0
Incr Delay (d2), s/veh	70.7	0.0	108.6				0.0	25.3	9.4	2.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.1	0.0	25.4				0.0	21.8	13.6	6.8	0.1	0.0
LnGrp Delay(d),s/veh	103.2	0.0	141.1				0.0	53.2	35.4	30.3	0.4	0.0
LnGrp LOS	F		F					F	D	C	A	
Approach Vol, veh/h		1078						1931			2124	
Approach Delay, s/veh		122.7						48.4			4.4	
Approach LOS		F						D			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	20.3	39.7		30.0		60.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	29.5		25.0		54.5		
Max Q Clear Time (g_c+I1), s	16.1	36.2		27.0		2.0		
Green Ext Time (p_c), s	0.2	0.0		0.0		50.6		

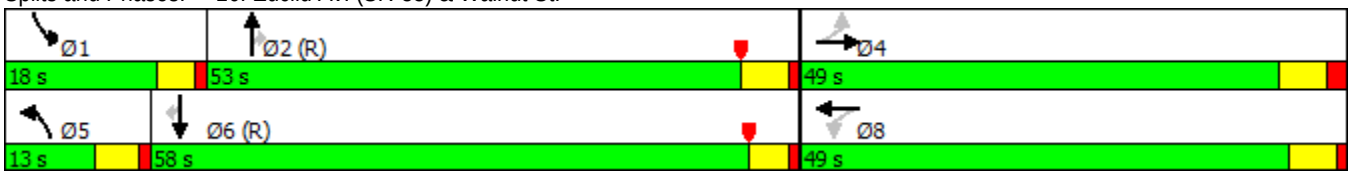
Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	158	411	124	357	178	1521	81	417	1799	225
Future Volume (vph)	158	411	124	357	178	1521	81	417	1799	225
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	49.0	49.0	49.0	49.0	13.0	53.0	53.0	18.0	58.0	58.0
Total Split (%)	40.8%	40.8%	40.8%	40.8%	10.8%	44.2%	44.2%	15.0%	48.3%	48.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	35.2	35.2	36.2	36.2	17.6	47.7	47.7	21.0	51.5	51.5
Actuated g/C Ratio	0.29	0.29	0.30	0.30	0.15	0.40	0.40	0.18	0.43	0.43
v/c Ratio	0.98	0.60	0.90	0.50	0.74	0.77	0.12	0.79	0.84	0.29
Control Delay	104.4	33.5	90.5	30.6	73.3	9.0	0.1	60.6	34.7	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.4	33.5	90.5	30.6	73.3	9.0	0.1	60.6	34.7	5.1
LOS	F	C	F	C	E	A	A	E	C	A
Approach Delay		48.2		42.2		15.0			36.4	
Approach LOS		D		D		B			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 31.9	Intersection LOS: C
Intersection Capacity Utilization 88.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	411	194	124	357	156	178	1521	81	417	1799	225
Future Volume (veh/h)	158	411	194	124	357	156	178	1521	81	417	1799	225
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	165	428	171	129	372	141	185	1584	61	434	1874	175
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	262	851	336	227	868	324	116	2153	661	353	2369	736
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.14	0.83	0.83	0.11	0.46	0.46
Sat Flow, veh/h	899	2517	995	832	2567	959	1714	5187	1592	3141	5187	1611
Grp Volume(v), veh/h	165	306	293	129	260	253	185	1584	61	434	1874	175
Grp Sat Flow(s),veh/h/ln	899	1805	1707	832	1805	1721	1714	1729	1592	1570	1729	1611
Q Serve(g_s), s	20.9	16.2	16.5	17.6	13.4	13.7	8.1	16.0	0.8	13.5	36.9	7.9
Cycle Q Clear(g_c), s	34.6	16.2	16.5	34.1	13.4	13.7	8.1	16.0	0.8	13.5	36.9	7.9
Prop In Lane	1.00		0.58	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	610	577	227	610	582	116	2153	661	353	2369	736
V/C Ratio(X)	0.63	0.50	0.51	0.57	0.43	0.43	1.60	0.74	0.09	1.23	0.79	0.24
Avail Cap(c_a), veh/h	277	642	607	249	657	627	116	2153	661	353	2369	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.43	0.43	0.43
Uniform Delay (d), s/veh	44.2	31.6	31.7	45.3	30.7	30.8	51.9	7.3	6.0	53.3	27.7	19.9
Incr Delay (d2), s/veh	4.2	0.6	0.7	2.5	0.5	0.5	273.1	0.2	0.0	113.3	1.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	8.2	7.9	4.2	6.7	6.6	12.6	7.1	0.3	11.4	17.8	3.6
LnGrp Delay(d),s/veh	48.4	32.3	32.4	47.9	31.2	31.3	325.0	7.5	6.1	166.5	28.9	20.2
LnGrp LOS	D	C	C	D	C	C	F	A	A	F	C	C
Approach Vol, veh/h		764			642			1830			2483	
Approach Delay, s/veh		35.8			34.6			39.6			52.4	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	55.1		46.9	13.0	60.1		46.9
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	13.5	47.7		42.7	8.1	* 54		* 44
Max Q Clear Time (g_c+I1), s	15.5	18.0		36.6	10.1	38.9		36.1
Green Ext Time (p_c), s	0.0	25.3		3.8	0.0	13.4		4.5

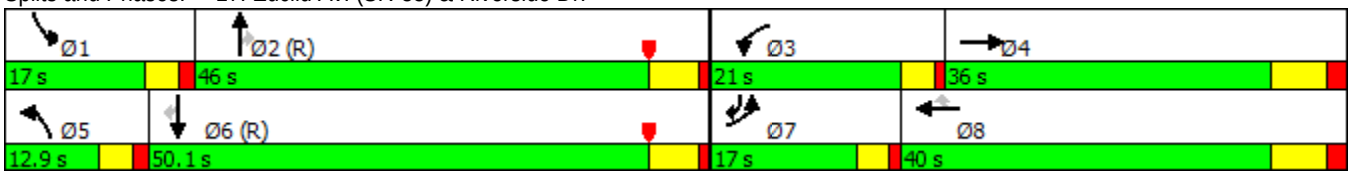
Intersection Summary	
HCM 2010 Ctrl Delay	44.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	192	492	233	441	70	297	1534	605	166	1737	227
Future Volume (vph)	192	492	233	441	70	297	1534	605	166	1737	227
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.0	28.1	17.0	32.1	32.1	9.3	40.5	40.5	13.4	44.6	59.1
Actuated g/C Ratio	0.11	0.23	0.14	0.27	0.27	0.08	0.34	0.34	0.11	0.37	0.49
v/c Ratio	1.11	0.86	1.04	0.49	0.15	2.42	1.35	0.85	0.93	1.39	0.29
Control Delay	148.7	52.7	118.1	38.9	3.7	662.7	195.8	32.4	77.3	209.6	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.7	52.7	118.1	38.9	3.7	662.7	195.8	32.4	77.3	209.6	16.2
LOS	F	D	F	D	A	F	F	C	E	F	B
Approach Delay		74.0		60.5			212.1			178.7	
Approach LOS		E		E			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.42	
Intersection Signal Delay: 163.0	Intersection LOS: F
Intersection Capacity Utilization 115.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	492	180	233	441	70	297	1534	605	166	1737	227
Future Volume (veh/h)	192	492	180	233	441	70	297	1534	605	166	1737	227
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	206	529	160	251	474	75	319	1649	520	178	1868	146
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	186	629	189	243	950	419	120	1261	564	179	1384	785
Arrive On Green	0.11	0.23	0.23	0.14	0.26	0.26	0.02	0.12	0.12	0.07	0.26	0.26
Sat Flow, veh/h	1714	2736	824	1714	3610	1592	1714	3610	1615	1714	3610	1591
Grp Volume(v), veh/h	206	348	341	251	474	75	319	1649	520	178	1868	146
Grp Sat Flow(s),veh/h/ln	1714	1805	1755	1714	1805	1592	1714	1805	1615	1714	1805	1591
Q Serve(g_s), s	13.0	22.1	22.3	17.0	13.4	4.4	8.4	41.9	38.2	12.5	46.0	7.2
Cycle Q Clear(g_c), s	13.0	22.1	22.3	17.0	13.4	4.4	8.4	41.9	38.2	12.5	46.0	7.2
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	415	403	243	950	419	120	1261	564	179	1384	785
V/C Ratio(X)	1.11	0.84	0.84	1.03	0.50	0.18	2.66	1.31	0.92	1.00	1.35	0.19
Avail Cap(c_a), veh/h	186	436	424	243	993	438	120	1261	564	179	1384	785
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.42	0.42	0.42
Uniform Delay (d), s/veh	53.5	44.1	44.2	51.5	37.5	34.2	58.6	53.1	51.5	55.8	44.6	20.9
Incr Delay (d2), s/veh	98.3	13.7	14.6	66.7	0.6	0.3	748.4	139.2	3.1	42.7	159.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	12.6	12.4	12.5	6.7	2.0	28.9	45.3	17.6	8.0	53.6	3.2
LnGrp Delay(d),s/veh	151.8	57.8	58.8	118.3	38.1	34.5	807.0	192.2	54.6	98.5	204.0	21.1
LnGrp LOS	F	E	E	F	D	C	F	F	D	F	F	C
Approach Vol, veh/h		895			800			2488			2192	
Approach Delay, s/veh		79.8			62.9			242.3			183.3	
Approach LOS		E			E			F			F	

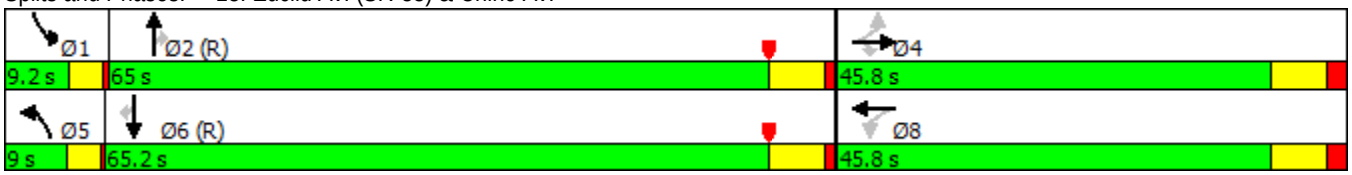
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	47.4	21.0	34.6	12.9	51.5	17.0	38.6
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	14.5	43.9	19.0	24.3	10.4	48.0	15.0	15.4
Green Ext Time (p_c), s	0.0	0.0	0.0	3.3	0.0	0.0	0.0	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	176.7
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	89	222	58	164	202	74	2382	431	50	1891	115
Future Volume (vph)	89	222	58	164	202	74	2382	431	50	1891	115
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	45.8	45.8	45.8	45.8	45.8	9.0	65.0	65.0	9.2	65.2	65.2
Total Split (%)	38.2%	38.2%	38.2%	38.2%	38.2%	7.5%	54.2%	54.2%	7.7%	54.3%	54.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	38.8	38.8	38.8		38.8	5.5	60.8	60.8	5.6	59.2	59.2
Actuated g/C Ratio	0.32	0.32	0.32		0.32	0.05	0.51	0.51	0.05	0.49	0.49
v/c Ratio	0.36	0.37	0.11		1.10	0.97	1.34	0.52	0.66	1.09	0.15
Control Delay	36.2	33.4	7.6		110.5	81.8	182.6	16.6	87.9	60.4	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	33.4	7.6		110.5	81.8	182.6	16.6	87.9	60.4	0.1
LOS	D	C	A		F	F	F	B	F	E	A
Approach Delay		30.0			110.5		155.3			57.7	
Approach LOS		C			F		F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 108.9	Intersection LOS: F
Intersection Capacity Utilization 118.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	222	58	164	202	79	74	2382	431	50	1891	115
Future Volume (veh/h)	89	222	58	164	202	79	74	2382	431	50	1891	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	92	229	60	169	208	77	76	2456	388	52	1949	90
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	278	614	522	170	172	62	79	1808	809	66	1781	780
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.09	1.00	1.00	0.08	0.99	0.99
Sat Flow, veh/h	1112	1900	1615	399	532	190	1714	3610	1615	1714	3610	1580
Grp Volume(v), veh/h	92	229	60	454	0	0	76	2456	388	52	1949	90
Grp Sat Flow(s),veh/h/ln	1112	1900	1615	1122	0	0	1714	1805	1615	1714	1805	1580
Q Serve(g_s), s	0.0	11.1	3.1	27.7	0.0	0.0	5.3	60.1	0.0	3.6	59.2	0.1
Cycle Q Clear(g_c), s	12.8	11.1	3.1	38.8	0.0	0.0	5.3	60.1	0.0	3.6	59.2	0.1
Prop In Lane	1.00		1.00	0.37		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	278	614	522	404	0	0	79	1808	809	66	1781	780
V/C Ratio(X)	0.33	0.37	0.11	1.12	0.00	0.00	0.97	1.36	0.48	0.79	1.09	0.12
Avail Cap(c_a), veh/h	278	614	522	404	0	0	79	1808	809	81	1781	780
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	31.8	31.2	28.5	46.6	0.0	0.0	54.4	0.0	0.0	54.9	0.8	0.4
Incr Delay (d2), s/veh	0.7	0.4	0.1	83.0	0.0	0.0	22.6	161.5	0.2	3.1	43.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	5.9	1.4	22.7	0.0	0.0	3.0	40.6	0.0	1.8	11.2	0.0
LnGrp Delay(d),s/veh	32.5	31.6	28.6	129.6	0.0	0.0	77.0	161.5	0.2	58.0	44.3	0.4
LnGrp LOS	C	C	C	F			E	F	A	E	F	A
Approach Vol, veh/h		381			454			2920			2091	
Approach Delay, s/veh		31.4			129.6			137.9			42.7	
Approach LOS		C			F			F			D	

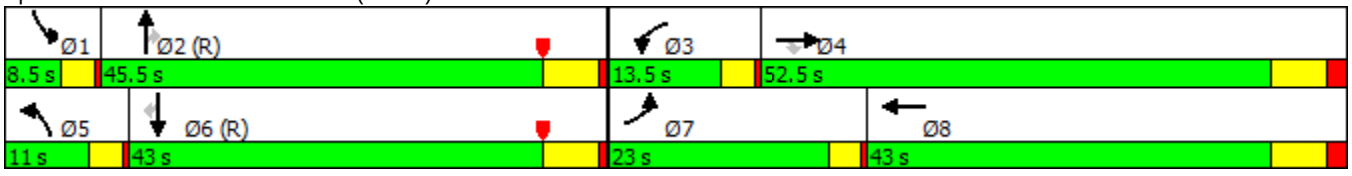
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	66.1		45.8	9.0	65.2		45.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	59.0		38.8	5.5	59.2		38.8
Max Q Clear Time (g_c+I1), s	5.6	62.1		14.8	7.3	61.2		40.8
Green Ext Time (p_c), s	0.0	0.0		4.8	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		96.3
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	459	289	237	34	63	214	2357	72	122	2079	364
Future Volume (vph)	459	289	237	34	63	214	2357	72	122	2079	364
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	31.6	31.6	10.0	16.7	26.5	45.8	45.8	18.0	37.4	37.4
Actuated g/C Ratio	0.16	0.26	0.26	0.08	0.14	0.22	0.38	0.38	0.15	0.31	0.31
v/c Ratio	1.71	0.60	0.41	0.25	0.46	0.59	1.76	0.11	0.49	1.91	0.65
Control Delay	365.2	43.4	7.2	56.2	33.6	35.1	370.0	3.7	59.4	432.3	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	365.2	43.4	7.2	56.2	33.6	35.1	370.0	3.7	59.4	432.3	12.8
LOS	F	D	A	E	C	D	F	A	E	F	B
Approach Delay		184.6			38.4		332.9			355.0	
Approach LOS		F			D		F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.91	
Intersection Signal Delay: 311.4	Intersection LOS: F
Intersection Capacity Utilization 123.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	459	289	237	34	63	64	214	2357	72	122	2079	364
Future Volume (veh/h)	459	289	237	34	63	64	214	2357	72	122	2079	364
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	473	298	168	35	65	61	221	2430	65	126	2143	322
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	279	398	339	98	94	89	107	1894	847	71	1818	795
Arrive On Green	0.16	0.21	0.21	0.06	0.10	0.10	0.04	0.35	0.35	0.03	0.34	0.34
Sat Flow, veh/h	1714	1900	1615	1714	903	847	1714	3610	1615	1714	3610	1579
Grp Volume(v), veh/h	473	298	168	35	0	126	221	2430	65	126	2143	322
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	0	1750	1714	1805	1615	1714	1805	1579
Q Serve(g_s), s	19.5	17.6	11.0	2.4	0.0	8.3	7.5	62.9	3.2	5.0	60.4	18.8
Cycle Q Clear(g_c), s	19.5	17.6	11.0	2.4	0.0	8.3	7.5	62.9	3.2	5.0	60.4	18.8
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	279	398	339	98	0	183	107	1894	847	71	1818	795
V/C Ratio(X)	1.70	0.75	0.50	0.36	0.00	0.69	2.06	1.28	0.08	1.76	1.18	0.40
Avail Cap(c_a), veh/h	279	720	612	143	0	525	107	1894	847	71	1818	795
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	50.2	44.4	41.8	54.4	0.0	51.8	57.5	38.9	19.5	58.3	39.8	25.9
Incr Delay (d2), s/veh	329.1	2.1	0.8	0.8	0.0	3.4	481.1	127.8	0.0	349.0	80.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	34.7	9.5	5.0	1.1	0.0	4.2	17.9	65.0	1.4	9.3	50.6	8.2
LnGrp Delay(d),s/veh	379.3	46.6	42.7	55.2	0.0	55.2	538.6	166.7	19.6	407.3	120.6	26.1
LnGrp LOS	F	D	D	E		E	F	F	B	F	F	C
Approach Vol, veh/h		939			161			2716			2591	
Approach Delay, s/veh		213.5			55.2			193.5			122.8	
Approach LOS		F			E			F			F	

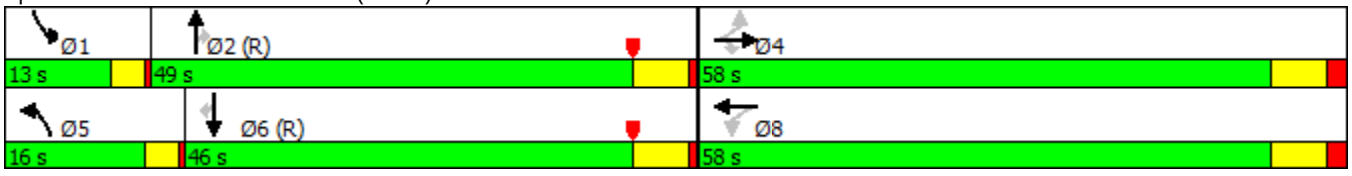
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	68.9	10.4	32.2	11.0	66.4	23.0	19.6
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	7.0	64.9	4.4	19.6	9.5	62.4	21.5	10.3
Green Ext Time (p_c), s	0.0	0.0	0.0	2.2	0.0	0.0	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	164.4
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	465	1072	337	165	509	191	1752	225	536	1502	217
Future Volume (vph)	465	1072	337	165	509	191	1752	225	536	1502	217
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	51.0	51.0	51.0	51.0	51.0	12.5	43.0	43.0	9.5	40.0	40.0
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.10	0.36	0.36	0.08	0.33	0.33
v/c Ratio	8.03	1.36	0.44	2.85	1.33	1.10	1.38	0.37	4.05	1.27	0.36
Control Delay	3206.8	198.5	13.0	893.9	188.1	87.3	210.4	29.1	1391.2	143.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3206.8	198.5	13.0	893.9	188.1	87.3	210.4	29.1	1391.2	143.4	2.0
LOS	F	F	B	F	F	F	F	C	F	F	A
Approach Delay		910.9			286.6		180.7			426.4	
Approach LOS		F			F		F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 8.03	
Intersection Signal Delay: 454.5	Intersection LOS: F
Intersection Capacity Utilization 184.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	465	1072	337	165	509	507	191	1752	225	536	1502	217
Future Volume (veh/h)	465	1072	337	165	509	507	191	1752	225	536	1502	217
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	474	1094	252	168	519	512	195	1788	210	547	1533	194
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	60	808	677	60	374	369	179	1294	579	136	1203	538
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.03	0.12	0.12	0.16	0.67	0.67
Sat Flow, veh/h	556	1900	1593	412	879	868	1714	3610	1615	1714	3610	1615
Grp Volume(v), veh/h	474	1094	252	168	0	1031	195	1788	210	547	1533	194
Grp Sat Flow(s),veh/h/ln	556	1900	1593	412	0	1747	1714	1805	1615	1714	1805	1615
Q Serve(g_s), s	0.0	51.0	13.0	0.0	0.0	51.0	12.5	43.0	14.4	9.5	40.0	6.3
Cycle Q Clear(g_c), s	51.0	51.0	13.0	51.0	0.0	51.0	12.5	43.0	14.4	9.5	40.0	6.3
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	808	677	60	0	742	179	1294	579	136	1203	538
V/C Ratio(X)	7.90	1.35	0.37	2.80	0.00	1.39	1.09	1.38	0.36	4.03	1.27	0.36
Avail Cap(c_a), veh/h	60	808	677	60	0	742	179	1294	579	136	1203	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	60.0	34.5	23.6	60.0	0.0	34.5	57.9	52.9	40.3	50.5	20.0	14.4
Incr Delay (d2), s/veh	3139.0	167.8	0.3	854.2	0.0	183.2	50.3	172.4	0.2	1365.3	123.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	54.3	64.3	5.7	16.2	0.0	62.3	8.4	52.5	6.5	55.9	40.1	2.8
LnGrp Delay(d),s/veh	3199.0	202.3	23.9	914.2	0.0	217.7	108.2	225.3	40.4	1415.8	143.9	14.6
LnGrp LOS	F	F	C	F		F	F	F	D	F	F	B
Approach Vol, veh/h		1820			1199			2193			2274	
Approach Delay, s/veh		958.0			315.3			197.2			438.8	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	49.0		58.0	16.0	46.0		58.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	11.5	45.0		53.0	14.5	42.0		53.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		474.5
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	107	42	250	60	20	161	2088	90	119	1842	68
Future Volume (vph)	107	42	250	60	20	161	2088	90	119	1842	68
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	20.1	20.1	20.1	20.1	20.1	17.1	67.0	67.0	18.9	68.7	68.7
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.14	0.56	0.56	0.16	0.57	0.57
v/c Ratio	0.64	0.14	0.66	0.30	0.34	0.72	1.13	0.11	0.48	0.97	0.08
Control Delay	59.8	38.5	23.0	43.0	13.7	64.4	77.9	0.6	59.5	16.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	38.5	23.0	43.0	13.7	64.4	77.9	0.6	59.5	16.9	0.1
LOS	E	D	C	D	B	E	E	A	E	B	A
Approach Delay		34.4			24.0		74.0			18.8	
Approach LOS		C			C		E			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.13	
Intersection Signal Delay: 46.4	Intersection LOS: D
Intersection Capacity Utilization 89.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	42	250	60	20	90	161	2088	90	119	1842	68
Future Volume (veh/h)	107	42	250	60	20	90	161	2088	90	119	1842	68
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	116	46	167	65	22	96	175	2270	97	129	2002	74
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	210	340	289	248	55	242	186	2392	1070	71	2152	941
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.11	0.66	0.66	0.08	1.00	1.00
Sat Flow, veh/h	1294	1900	1615	1187	310	1352	1714	3610	1615	1714	3610	1579
Grp Volume(v), veh/h	116	46	167	65	0	118	175	2270	97	129	2002	74
Grp Sat Flow(s),veh/h/ln	1294	1900	1615	1187	0	1661	1714	1805	1615	1714	1805	1579
Q Serve(g_s), s	10.4	2.4	11.4	5.8	0.0	7.5	12.2	68.6	2.6	5.0	0.0	0.0
Cycle Q Clear(g_c), s	18.0	2.4	11.4	8.3	0.0	7.5	12.2	68.6	2.6	5.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.81	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	210	340	289	248	0	297	186	2392	1070	71	2152	941
V/C Ratio(X)	0.55	0.14	0.58	0.26	0.00	0.40	0.94	0.95	0.09	1.81	0.93	0.08
Avail Cap(c_a), veh/h	432	665	565	451	0	582	186	2392	1070	71	2152	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	51.5	41.4	45.1	44.9	0.0	43.5	53.1	18.4	7.3	55.0	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.1	1.4	0.4	0.0	0.6	49.3	9.8	0.2	367.7	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	1.3	5.2	1.9	0.0	3.5	8.3	37.0	1.2	9.6	0.3	0.0
LnGrp Delay(d),s/veh	53.1	41.6	46.5	45.3	0.0	44.2	102.4	28.2	7.4	422.7	1.0	0.0
LnGrp LOS	D	D	D	D		D	F	C	A	F	A	A
Approach Vol, veh/h		329			183			2542			2205	
Approach Delay, s/veh		48.1			44.6			32.5			25.6	
Approach LOS		D			D			C			C	

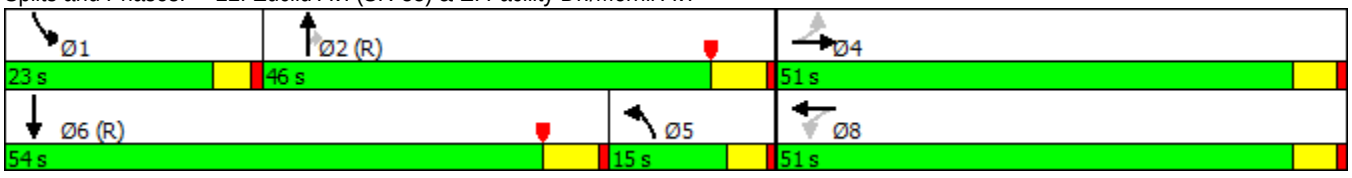
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	85.2		26.3	16.5	77.2		26.3
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	7.0	70.6		20.0	14.2	2.0		10.3
Green Ext Time (p_c), s	0.0	0.0		1.5	0.0	47.0		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	10	8	231	62	25	1093	159	473	2037
Future Volume (vph)	10	8	231	62	25	1093	159	473	2037
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	51.0	51.0	51.0	51.0	15.0	46.0	46.0	23.0	54.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	12.5%	38.3%	38.3%	19.2%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		46.3		46.3	10.3	39.7	39.7	18.5	53.7
Actuated g/C Ratio		0.39		0.39	0.09	0.33	0.33	0.15	0.45
v/c Ratio		0.04		1.24	0.18	0.95	0.29	1.87	1.35
Control Delay		19.9		149.8	43.6	46.8	11.8	427.4	196.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		19.9		149.8	43.6	46.8	11.8	427.4	196.8
LOS		B		F	D	D	B	F	F
Approach Delay		19.9		149.8		42.4			239.3
Approach LOS		B		F		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 15 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.87	
Intersection Signal Delay: 169.2	Intersection LOS: F
Intersection Capacity Utilization 130.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	8	5	231	62	465	25	1093	159	473	2037	56
Future Volume (veh/h)	10	8	5	231	62	465	25	1093	159	473	2037	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	10	8	4	241	65	438	26	1139	140	493	2122	55
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	206	160	72	237	53	359	129	1203	538	264	1438	37
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.08	0.33	0.33	0.15	0.40	0.40
Sat Flow, veh/h	423	417	187	515	139	936	1714	3610	1615	1714	3596	93
Grp Volume(v), veh/h	22	0	0	744	0	0	26	1139	140	493	1061	1116
Grp Sat Flow(s),veh/h/ln	1026	0	0	1591	0	0	1714	1805	1615	1714	1805	1884
Q Serve(g_s), s	0.0	0.0	0.0	45.1	0.0	0.0	1.7	36.9	7.6	18.5	48.0	48.0
Cycle Q Clear(g_c), s	0.9	0.0	0.0	46.0	0.0	0.0	1.7	36.9	7.6	18.5	48.0	48.0
Prop In Lane	0.45		0.18	0.32		0.59	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	437	0	0	649	0	0	129	1203	538	264	722	753
V/C Ratio(X)	0.05	0.00	0.00	1.15	0.00	0.00	0.20	0.95	0.26	1.87	1.47	1.48
Avail Cap(c_a), veh/h	437	0	0	649	0	0	150	1203	538	264	722	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.67	0.67	0.67	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	0.0	38.3	0.0	0.0	52.1	39.0	29.2	50.8	36.0	36.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	82.8	0.0	0.0	0.2	11.9	0.8	403.6	218.6	223.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	36.4	0.0	0.0	0.8	20.3	3.5	38.4	67.7	71.8
LnGrp Delay(d),s/veh	23.1	0.0	0.0	121.1	0.0	0.0	52.3	50.9	30.0	454.3	254.6	259.9
LnGrp LOS	C			F			D	D	C	F	F	F
Approach Vol, veh/h		22			744			1305			2670	
Approach Delay, s/veh		23.1			121.1			48.7			293.7	
Approach LOS		C			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	46.0		51.0	15.0	54.0		51.0
Change Period (Y+Rc), s	4.5	6.0		5.0	6.0	* 6		5.0
Max Green Setting (Gmax), s	18.5	40.0		46.0	10.5	* 48		46.0
Max Q Clear Time (g_c+I1), s	20.5	38.9		2.9	3.7	50.0		48.0
Green Ext Time (p_c), s	0.0	0.8		3.5	3.9	0.0		0.0

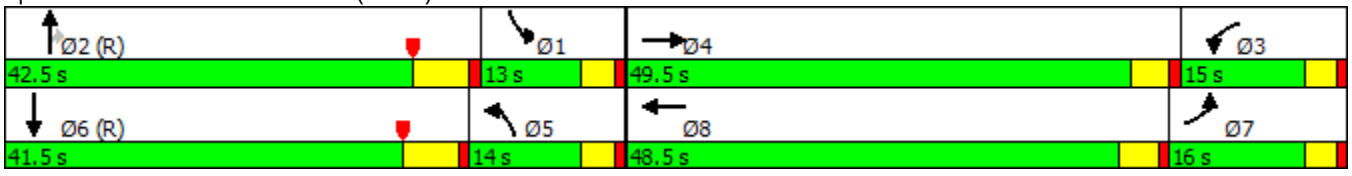
Intersection Summary			
HCM 2010 Ctrl Delay		197.9	
HCM 2010 LOS		F	

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	277	533	256	409	195	1317	282	325	1272
Future Volume (vph)	277	533	256	409	195	1317	282	325	1272
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	16.0	49.5	15.0	48.5	14.0	42.5	42.5	13.0	41.5
Total Split (%)	13.3%	41.3%	12.5%	40.4%	11.7%	35.4%	35.4%	10.8%	34.6%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	28.0	33.9	22.1	28.0	10.0	36.5	36.5	9.0	35.5
Actuated g/C Ratio	0.23	0.28	0.18	0.23	0.08	0.30	0.30	0.08	0.30
v/c Ratio	0.72	0.78	0.85	0.81	1.43	1.25	0.47	2.65	1.48
Control Delay	51.2	40.5	73.0	39.3	258.5	153.0	16.9	766.5	241.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	40.5	73.0	39.3	258.5	153.0	16.9	766.5	241.8
LOS	D	D	E	D	F	F	B	F	F
Approach Delay		43.4		48.2		143.0			335.5
Approach LOS		D		D		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.65	
Intersection Signal Delay: 170.5	Intersection LOS: F
Intersection Capacity Utilization 108.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	277	533	232	256	409	306	195	1317	282	325	1272	226
Future Volume (veh/h)	277	533	232	256	409	306	195	1317	282	325	1272	226
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	289	555	238	267	426	285	203	1372	279	339	1325	217
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	192	629	269	157	489	325	348	1098	491	334	919	149
Arrive On Green	0.22	0.51	0.51	0.09	0.24	0.24	0.14	0.20	0.20	0.19	0.30	0.30
Sat Flow, veh/h	1714	2465	1054	1714	2081	1381	1714	3610	1615	1714	3105	503
Grp Volume(v), veh/h	289	406	387	267	369	342	203	1372	279	339	765	777
Grp Sat Flow(s),veh/h/ln	1714	1805	1714	1714	1805	1656	1714	1805	1615	1714	1805	1804
Q Serve(g_s), s	13.4	24.0	24.2	11.0	23.6	23.9	13.3	36.5	18.7	23.4	35.5	35.5
Cycle Q Clear(g_c), s	13.4	24.0	24.2	11.0	23.6	23.9	13.3	36.5	18.7	23.4	35.5	35.5
Prop In Lane	1.00		0.62	1.00		0.83	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	192	461	437	157	424	389	348	1098	491	334	534	534
V/C Ratio(X)	1.51	0.88	0.88	1.70	0.87	0.88	0.58	1.25	0.57	1.02	1.43	1.46
Avail Cap(c_a), veh/h	192	677	643	157	662	607	348	1098	491	334	534	534
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.56	1.00	1.00	1.00	0.38	0.38	0.38	0.10	0.10	0.10
Uniform Delay (d), s/veh	46.6	27.8	27.8	54.5	44.1	44.2	47.1	47.8	40.7	48.3	42.3	42.3
Incr Delay (d2), s/veh	243.5	5.5	6.0	340.3	4.9	5.9	0.6	115.3	1.8	19.3	195.4	206.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.2	12.4	11.9	20.0	12.4	11.6	6.4	35.8	8.6	12.8	46.6	48.3
LnGrp Delay(d),s/veh	290.1	33.3	33.8	394.8	49.0	50.1	47.7	163.1	42.5	67.7	237.7	249.0
LnGrp LOS	F	C	C	F	D	D	D	F	D	F	F	F
Approach Vol, veh/h		1082			978			1854			1881	
Approach Delay, s/veh		102.0			143.8			132.3			211.7	
Approach LOS		F			F			F			F	

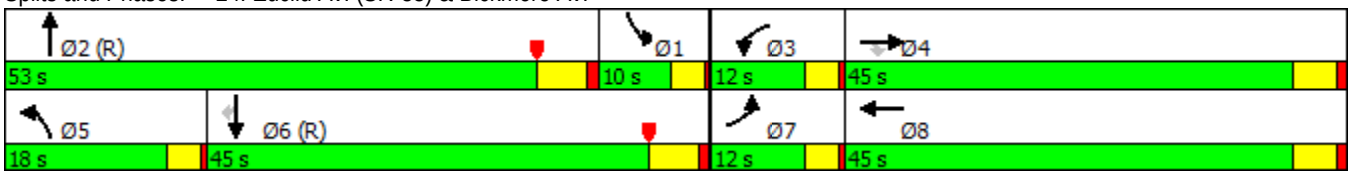
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.4	42.5	15.0	35.1	28.4	41.5	17.4	32.7
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	9.0	36.5	11.0	45.0	10.0	35.5	12.0	44.0
Max Q Clear Time (g_c+I1), s	25.4	38.5	13.0	26.2	15.3	37.5	15.4	25.9
Green Ext Time (p_c), s	0.0	0.0	0.0	4.5	0.0	0.0	0.0	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	154.4
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	175	58	60	65	18	15	1429	161	1499	47
Future Volume (vph)	175	58	60	65	18	15	1429	161	1499	47
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	12.0	45.0	45.0	12.0	45.0	18.0	53.0	10.0	45.0	45.0
Total Split (%)	10.0%	37.5%	37.5%	10.0%	37.5%	15.0%	44.2%	8.3%	37.5%	37.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	8.5	20.8	20.8	7.8	18.3	5.9	69.2	6.5	75.0	75.0
Actuated g/C Ratio	0.07	0.17	0.17	0.06	0.15	0.05	0.58	0.05	0.62	0.62
v/c Ratio	1.60	0.19	0.17	0.65	0.70	0.20	0.79	1.95	0.74	0.05
Control Delay	342.3	41.3	0.9	80.8	38.2	70.0	14.7	456.0	12.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	342.3	41.3	0.9	80.8	38.2	70.0	14.7	456.0	12.3	0.4
LOS	F	D	A	F	D	E	B	F	B	A
Approach Delay		212.6			48.3		15.3		53.9	
Approach LOS		F			D		B		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.95	
Intersection Signal Delay: 50.5	Intersection LOS: D
Intersection Capacity Utilization 88.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	58	60	65	18	190	15	1429	52	161	1499	47
Future Volume (veh/h)	175	58	60	65	18	190	15	1429	52	161	1499	47
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	194	64	48	72	20	199	17	1588	48	179	1666	52
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	121	330	281	91	23	232	31	1415	43	368	2200	964
Arrive On Green	0.07	0.17	0.17	0.05	0.16	0.16	0.04	0.79	0.79	0.29	0.81	0.81
Sat Flow, veh/h	1714	1900	1615	1714	150	1488	1714	3575	108	1714	3610	1582
Grp Volume(v), veh/h	194	64	48	72	0	219	17	800	836	179	1666	52
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	0	1637	1714	1805	1878	1714	1805	1582
Q Serve(g_s), s	8.5	3.5	3.0	5.0	0.0	15.6	1.2	47.5	47.5	10.4	27.2	0.8
Cycle Q Clear(g_c), s	8.5	3.5	3.0	5.0	0.0	15.6	1.2	47.5	47.5	10.4	27.2	0.8
Prop In Lane	1.00		1.00	1.00		0.91	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	121	330	281	91	0	255	31	714	743	368	2200	964
V/C Ratio(X)	1.60	0.19	0.17	0.79	0.00	0.86	0.55	1.12	1.13	0.49	0.76	0.05
Avail Cap(c_a), veh/h	121	633	538	121	0	546	207	714	743	368	2200	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	55.8	42.4	42.2	56.2	0.0	49.3	57.4	12.5	12.5	37.4	7.0	4.5
Incr Delay (d2), s/veh	304.0	0.1	0.1	16.2	0.0	3.2	0.5	55.6	58.2	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	1.8	1.4	2.8	0.0	7.3	0.6	33.3	35.1	4.9	13.1	0.3
LnGrp Delay(d),s/veh	359.7	42.5	42.3	72.4	0.0	52.6	57.9	68.1	70.7	37.4	7.3	4.5
LnGrp LOS	F	D	D	E		D	E	F	F	D	A	A
Approach Vol, veh/h		306			291			1653			1897	
Approach Delay, s/veh		243.6			57.5			69.3			10.0	
Approach LOS		F			E			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.3	53.0	9.9	25.9	5.7	78.6	12.0	23.7
Change Period (Y+Rc), s	5.5	* 5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	6.5	* 48	8.5	40.0	14.5	39.5	8.5	40.0
Max Q Clear Time (g_c+I1), s	12.4	49.5	7.0	5.5	3.2	29.2	10.5	17.6
Green Ext Time (p_c), s	0.0	0.0	0.0	1.1	0.0	5.7	0.0	1.1

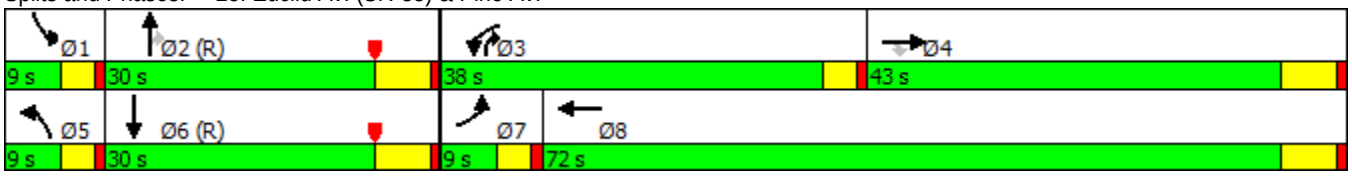
Intersection Summary	
HCM 2010 Ctrl Delay	54.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	128	865	367	851	552	212	1027	770	318	1215
Future Volume (vph)	128	865	367	851	552	212	1027	770	318	1215
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	37.5	37.5	33.5	66.0	5.0	24.0	63.5	5.0	24.0
Actuated g/C Ratio	0.04	0.31	0.31	0.28	0.55	0.04	0.20	0.53	0.04	0.20
v/c Ratio	1.86	1.50	0.63	0.95	0.87	3.08	1.47	0.90	4.62	1.87
Control Delay	466.9	266.5	27.6	62.2	33.4	962.0	244.3	21.7	1664.2	423.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	466.9	266.5	27.6	62.2	33.4	962.0	244.3	21.7	1664.2	423.5
LOS	F	F	C	E	C	F	F	C	F	F
Approach Delay		221.0			47.8		234.9			666.9
Approach LOS		F			D		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 4.62	
Intersection Signal Delay: 289.3	Intersection LOS: F
Intersection Capacity Utilization 136.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	865	367	851	552	297	212	1027	770	318	1215	88
Future Volume (veh/h)	128	865	367	851	552	297	212	1027	770	318	1215	88
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	132	892	0	877	569	300	219	1059	361	328	1253	87
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	586	498	923	638	337	71	742	781	71	703	49
Arrive On Green	0.04	0.31	0.00	0.28	0.54	0.54	0.04	0.21	0.21	0.01	0.07	0.07
Sat Flow, veh/h	1714	1900	1615	3326	1173	618	1714	3610	1615	1714	3419	237
Grp Volume(v), veh/h	132	892	0	877	0	869	219	1059	361	328	660	680
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1663	0	1791	1714	1805	1615	1714	1805	1851
Q Serve(g_s), s	5.0	37.0	0.0	31.0	0.0	51.5	5.0	24.7	17.8	5.0	24.7	24.7
Cycle Q Clear(g_c), s	5.0	37.0	0.0	31.0	0.0	51.5	5.0	24.7	17.8	5.0	24.7	24.7
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	71	586	498	923	0	975	71	742	781	71	371	381
V/C Ratio(X)	1.85	1.52	0.00	0.95	0.00	0.89	3.07	1.43	0.46	4.59	1.78	1.79
Avail Cap(c_a), veh/h	71	586	498	942	0	985	71	742	781	71	371	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.68	0.68	0.68
Uniform Delay (d), s/veh	57.5	41.5	0.0	42.5	0.0	24.2	57.5	47.7	20.6	59.2	55.9	55.9
Incr Delay (d2), s/veh	430.3	243.8	0.0	17.9	0.0	10.5	933.1	192.6	0.2	1638.0	357.7	360.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	59.0	0.0	16.5	0.0	28.2	20.9	32.1	8.0	34.9	49.2	50.8
LnGrp Delay(d),s/veh	487.8	285.3	0.0	60.4	0.0	34.7	990.6	240.2	20.8	1697.1	413.7	416.4
LnGrp LOS	F	F		E		C	F	F	C	F	F	F
Approach Vol, veh/h		1024			1746			1639			1668	
Approach Delay, s/veh		311.4			47.6			292.2			667.2	
Approach LOS		F			D			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	30.7	37.3	43.0	9.0	30.7	9.0	71.3
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	26.7	33.0	39.0	7.0	26.7	7.0	53.5
Green Ext Time (p_c), s	0.0	0.0	0.3	0.0	0.0	0.0	0.0	10.3

Intersection Summary	
HCM 2010 Ctrl Delay	328.1
HCM 2010 LOS	F

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	826	228	395	2034	262	1218
Future Volume (vph)	826	228	395	2034	262	1218
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	48.0	48.0	36.0	84.0	36.0	36.0
Total Split (%)	40.0%	40.0%	30.0%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	44.1	44.1	31.9	79.5	32.5	32.5
Actuated g/C Ratio	0.37	0.37	0.27	0.66	0.27	0.27
v/c Ratio	0.69	0.34	0.97	0.95	0.34	1.71
Control Delay	40.1	11.7	64.0	14.6	36.6	344.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	11.7	64.0	14.6	36.6	344.5
LOS	D	B	E	B	D	F
Approach Delay	33.9			22.7	290.0	
Approach LOS	C			C	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.71	
Intersection Signal Delay: 104.8	Intersection LOS: F
Intersection Capacity Utilization 105.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	826	228	395	2034	262	1218
Future Volume (veh/h)	826	228	395	2034	262	1218
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1700	1900
Adj Flow Rate, veh/h	918	0	439	2260	291	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1881	841	461	2956	360	185
Arrive On Green	0.52	0.00	0.27	0.82	0.11	0.00
Sat Flow, veh/h	3705	1615	1714	3705	3141	1615
Grp Volume(v), veh/h	918	0	439	2260	291	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1714	1805	1570	1615
Q Serve(g_s), s	19.6	0.0	30.2	36.4	10.8	0.0
Cycle Q Clear(g_c), s	19.6	0.0	30.2	36.4	10.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1881	841	461	2956	360	185
V/C Ratio(X)	0.49	0.00	0.95	0.76	0.81	0.00
Avail Cap(c_a), veh/h	1881	841	464	2956	851	437
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	18.5	0.0	43.1	5.3	51.8	0.0
Incr Delay (d2), s/veh	0.9	0.0	5.2	0.2	4.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	0.0	14.9	17.7	4.9	0.0
LnGrp Delay(d),s/veh	19.4	0.0	48.3	5.4	56.2	0.0
LnGrp LOS	B		D	A	E	
Approach Vol, veh/h	918			2699	291	
Approach Delay, s/veh	19.4			12.4	56.2	
Approach LOS	B			B	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	35.7	67.0				102.8		17.2
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	32.5	43.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	32.2	21.6				38.4		12.8
Green Ext Time (p_c), s	0.0	19.0				32.0		0.9

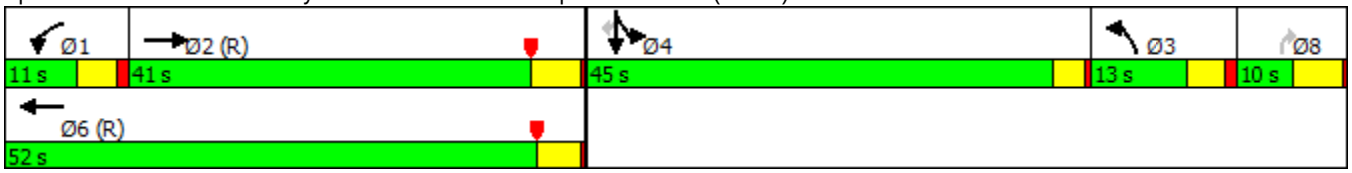
Intersection Summary	
HCM 2010 Ctrl Delay	17.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	412	115	815	35	18	714	164	102
Future Volume (vph)	412	115	815	35	18	714	164	102
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	41.0	11.0	52.0	13.0	10.0	45.0	45.0	45.0
Total Split (%)	34.2%	9.2%	43.3%	10.8%	8.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	39.4	12.0	56.5	7.4	5.0	37.8	37.8	37.8
Actuated g/C Ratio	0.33	0.10	0.47	0.06	0.04	0.32	0.32	0.32
v/c Ratio	0.41	0.70	0.49	0.34	0.10	0.88	0.83	0.17
Control Delay	32.5	69.4	14.9	62.4	1.0	57.6	51.3	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	69.4	14.9	62.4	1.0	57.6	51.3	2.2
LOS	C	E	B	E	A	E	D	A
Approach Delay	32.5		21.7				49.0	
Approach LOS	C		C				D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 35.2 — Intersection LOS: D
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	412	50	115	815	0	35	0	18	714	164	102
Future Volume (veh/h)	0	412	50	115	815	0	35	0	18	714	164	102
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0	1800	0	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	425	52	119	840	0	36	0	19	857	0	105
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1806	220	93	2343	0	0	0	0	961	0	453
Arrive On Green	0.00	0.56	0.56	0.11	1.00	0.00	0.00	0.00	0.00	0.28	0.00	0.28
Sat Flow, veh/h	0	3336	394	1714	3705	0		0		3429	0	1615
Grp Volume(v), veh/h	0	236	241	119	840	0		0.0		857	0	105
Grp Sat Flow(s),veh/h/ln	0	1805	1830	1714	1805	0				1714	0	1615
Q Serve(g_s), s	0.0	8.0	8.1	6.5	0.0	0.0				28.8	0.0	6.0
Cycle Q Clear(g_c), s	0.0	8.0	8.1	6.5	0.0	0.0				28.8	0.0	6.0
Prop In Lane	0.00		0.22	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1006	1020	93	2343	0				961	0	453
V/C Ratio(X)	0.00	0.23	0.24	1.28	0.36	0.00				0.89	0.00	0.23
Avail Cap(c_a), veh/h	0	1006	1020	93	2343	0				1186	0	559
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.5	13.5	53.5	0.0	0.0				41.4	0.0	33.2
Incr Delay (d2), s/veh	0.0	0.5	0.5	186.6	0.4	0.0				7.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.1	4.2	7.9	0.1	0.0				14.6	0.0	2.7
LnGrp Delay(d),s/veh	0.0	14.1	14.1	240.1	0.4	0.0				49.0	0.0	33.5
LnGrp LOS		B	B	F	A					D		C
Approach Vol, veh/h		477			959						962	
Approach Delay, s/veh		14.1			30.2						47.3	
Approach LOS		B			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	11.0	71.9		37.1		82.9		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	6.5	36.0		41.5		* 48		
Max Q Clear Time (g_c+I1), s	8.5	10.1		30.8		2.0		
Green Ext Time (p_c), s	0.0	6.6		2.8		7.1		

Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1278	0	0	1123	0	0	0	0	0	0	0
Future Vol, veh/h	0	1278	0	0	1123	0	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	260	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1345	0	0	1182	0	0	0	0	0	0	0

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	1182	0	-	-	-	0				1855	2527	591
Stage 1	-	-	-	-	-	-				1182	1182	-
Stage 2	-	-	-	-	-	-				673	1345	-
Critical Hdwy	4.1	-	-	-	-	-				6.8	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-				5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.8	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-				3.5	4	3.3
Pot Cap-1 Maneuver	598	-	0	0	-	-				67	28	455
Stage 1	-	-	0	0	-	-				258	266	-
Stage 2	-	-	0	0	-	-				474	222	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	598	-	-	-	-	-				67	0	455
Mov Cap-2 Maneuver	-	-	-	-	-	-				180	0	-
Stage 1	-	-	-	-	-	-				258	0	-
Stage 2	-	-	-	-	-	-				474	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	598	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1229	49	48	1090	33	43
Future Vol, veh/h	1229	49	48	1090	33	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1322	53	52	1172	35	46

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1374	0	2623	687
Stage 1	-	-	-	-	1348	-
Stage 2	-	-	-	-	1275	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	506	-	~ 23	394
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	265	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	506	-	~ 21	394
Mov Cap-2 Maneuver	-	-	-	-	148	-
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	238	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	24.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	148	394	-	-	506	-
HCM Lane V/C Ratio	0.24	0.117	-	-	0.102	-
HCM Control Delay (s)	36.8	15.3	-	-	12.9	-
HCM Lane LOS	E	C	-	-	B	-
HCM 95th %tile Q(veh)	0.9	0.4	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1229	49	171	1090	33	143
Future Vol, veh/h	1229	49	171	1090	33	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1322	53	184	1172	35	154

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1374	0	2888	687
Stage 1	-	-	-	-	1348	-
Stage 2	-	-	-	-	1540	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	506	-	~ 15	394
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	197	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	506	-	~ 10	394
Mov Cap-2 Maneuver	-	-	-	-	100	-
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	125	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	27.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	100	394	-	-	506	-
HCM Lane V/C Ratio	0.355	0.39	-	-	0.363	-
HCM Control Delay (s)	59.6	19.9	-	-	16.1	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	1.4	1.8	-	-	1.6	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1209	52	1090	48	61
Future Volume (vph)	1209	52	1090	48	61
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	31.6	5.1	37.3	10.1	10.1
Actuated g/C Ratio	0.54	0.09	0.64	0.17	0.17
v/c Ratio	0.69	0.37	0.95	0.17	0.19
Control Delay	13.4	33.6	29.0	23.2	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	33.6	29.0	23.2	8.5
LOS	B	C	C	C	A
Approach Delay	13.4		29.2	15.0	
Approach LOS	B		C	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 58.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 20.6	Intersection LOS: C
Intersection Capacity Utilization 75.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1209	63	52	1090	48	61
Future Volume (veh/h)	1209	63	52	1090	48	61
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1273	66	55	1147	51	62
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1769	92	86	1208	294	277
Arrive On Green	0.51	0.51	0.05	0.64	0.17	0.17
Sat Flow, veh/h	3582	180	1714	1900	1714	1615
Grp Volume(v), veh/h	658	681	55	1147	51	62
Grp Sat Flow(s),veh/h/ln	1805	1862	1714	1900	1714	1615
Q Serve(g_s), s	16.6	16.7	1.9	32.6	1.5	1.9
Cycle Q Clear(g_c), s	16.6	16.7	1.9	32.6	1.5	1.9
Prop In Lane		0.10	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	916	945	86	1208	294	277
V/C Ratio(X)	0.72	0.72	0.64	0.95	0.17	0.22
Avail Cap(c_a), veh/h	916	945	149	1247	294	277
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	11.2	27.4	9.8	20.8	21.0
Incr Delay (d2), s/veh	2.7	2.7	2.9	14.8	1.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	9.2	0.9	21.5	0.8	1.0
LnGrp Delay(d),s/veh	14.0	13.9	30.3	24.6	22.1	22.8
LnGrp LOS	B	B	C	C	C	C
Approach Vol, veh/h	1339			1202	113	
Approach Delay, s/veh	14.0			24.8	22.5	
Approach LOS	B			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.6	36.0				43.6		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	3.9	18.7				34.6		3.9
Green Ext Time (p_c), s	0.0	8.9				2.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1309	237	1213	48	211
Future Volume (vph)	1309	237	1213	48	211
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	44.3	20.6	64.9	15.1	15.1
Total Split (%)	55.4%	25.8%	81.1%	18.9%	18.9%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	35.2	13.9	53.8	10.1	10.1
Actuated g/C Ratio	0.47	0.18	0.71	0.13	0.13
v/c Ratio	0.86	0.79	0.94	0.22	0.54
Control Delay	24.5	48.9	24.6	34.1	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	48.9	24.6	34.1	10.6
LOS	C	D	C	C	B
Approach Delay	24.5		28.6	15.0	
Approach LOS	C		C	B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 75.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 25.6	Intersection LOS: C
Intersection Capacity Utilization 81.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1309	63	237	1213	48	211
Future Volume (veh/h)	1309	63	237	1213	48	211
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1378	66	249	1277	51	220
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1751	84	287	1381	220	207
Arrive On Green	0.50	0.50	0.17	0.73	0.13	0.13
Sat Flow, veh/h	3597	167	1714	1900	1714	1615
Grp Volume(v), veh/h	709	735	249	1277	51	220
Grp Sat Flow(s),veh/h/ln	1805	1865	1714	1900	1714	1615
Q Serve(g_s), s	25.2	25.4	11.0	43.7	2.1	10.0
Cycle Q Clear(g_c), s	25.2	25.4	11.0	43.7	2.1	10.0
Prop In Lane		0.09	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	902	932	287	1381	220	207
V/C Ratio(X)	0.79	0.79	0.87	0.92	0.23	1.06
Avail Cap(c_a), veh/h	902	932	352	1431	220	207
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	16.1	31.6	8.9	30.5	34.0
Incr Delay (d2), s/veh	4.6	4.6	15.0	10.2	2.5	79.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	14.1	6.4	25.9	1.1	9.0
LnGrp Delay(d),s/veh	20.7	20.7	46.6	19.1	33.0	113.7
LnGrp LOS	C	C	D	B	C	F
Approach Vol, veh/h	1444			1526	271	
Approach Delay, s/veh	20.7			23.6	98.5	
Approach LOS	C			C	F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.7	45.2				62.8		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	16.0	38.1				58.7		10.0
Max Q Clear Time (g_c+I1), s	13.0	27.4				45.7		12.0
Green Ext Time (p_c), s	0.1	9.8				11.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.6
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1046	216	956	186	184
Future Volume (vph)	1046	216	956	186	184
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	27.2	5.9	37.7	10.0	10.0
Actuated g/C Ratio	0.46	0.10	0.64	0.17	0.17
v/c Ratio	0.84	1.35	0.84	0.68	0.69
Control Delay	19.7	217.4	16.5	38.0	36.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	217.4	16.5	38.0	36.4
LOS	B	F	B	D	D
Approach Delay	19.7		53.5	37.2	
Approach LOS	B		D	D	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 58.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.35	
Intersection Signal Delay: 36.1	Intersection LOS: D
Intersection Capacity Utilization 72.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1046	224	216	956	186	184
Future Volume (veh/h)	1046	224	216	956	186	184
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1125	241	232	1028	200	192
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1387	295	171	1231	290	273
Arrive On Green	0.47	0.47	0.10	0.65	0.17	0.17
Sat Flow, veh/h	3044	627	1714	1900	1714	1615
Grp Volume(v), veh/h	686	680	232	1028	200	192
Grp Sat Flow(s),veh/h/ln	1805	1772	1714	1900	1714	1615
Q Serve(g_s), s	19.2	19.5	5.9	24.5	6.5	6.6
Cycle Q Clear(g_c), s	19.2	19.5	5.9	24.5	6.5	6.6
Prop In Lane		0.35	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	849	833	171	1231	290	273
V/C Ratio(X)	0.81	0.82	1.36	0.83	0.69	0.70
Avail Cap(c_a), veh/h	876	860	171	1260	290	273
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.4	13.5	26.6	8.0	23.1	23.2
Incr Delay (d2), s/veh	5.5	6.0	193.3	4.9	12.6	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	10.8	11.9	14.3	4.1	4.0
LnGrp Delay(d),s/veh	18.9	19.5	219.9	12.9	35.7	37.2
LnGrp LOS	B	B	F	B	D	D
Approach Vol, veh/h	1366			1260	392	
Approach Delay, s/veh	19.2			51.0	36.5	
Approach LOS	B			D	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.5	34.0				44.5		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	7.9	21.5				26.5		8.6
Green Ext Time (p_c), s	0.0	6.3				10.4		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1296	216	1264	186	184
Future Volume (vph)	1296	216	1264	186	184
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	55.9	18.0	73.9	16.1	16.1
Total Split (%)	62.1%	20.0%	82.1%	17.9%	17.9%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	46.7	13.1	64.5	11.6	11.6
Actuated g/C Ratio	0.54	0.15	0.74	0.13	0.13
v/c Ratio	0.86	0.90	0.96	0.88	0.87
Control Delay	23.2	74.7	28.5	76.0	70.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	74.7	28.5	76.0	70.5
LOS	C	E	C	E	E
Approach Delay	23.2		35.3	73.3	
Approach LOS	C		D	E	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 34.0	Intersection LOS: C
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1296	224	216	1264	186	184
Future Volume (veh/h)	1296	224	216	1264	186	184
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1394	241	232	1359	200	192
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1691	288	257	1427	220	207
Arrive On Green	0.55	0.55	0.15	0.75	0.13	0.13
Sat Flow, veh/h	3170	523	1714	1900	1714	1615
Grp Volume(v), veh/h	809	826	232	1359	200	192
Grp Sat Flow(s),veh/h/ln	1805	1793	1714	1900	1714	1615
Q Serve(g_s), s	32.8	34.4	11.9	56.0	10.3	10.5
Cycle Q Clear(g_c), s	32.8	34.4	11.9	56.0	10.3	10.5
Prop In Lane		0.29	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	992	986	257	1427	220	207
V/C Ratio(X)	0.82	0.84	0.90	0.95	0.91	0.93
Avail Cap(c_a), veh/h	1002	996	257	1437	220	207
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	16.8	37.4	9.8	38.5	38.6
Incr Delay (d2), s/veh	5.3	6.3	31.5	14.0	40.7	45.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.6	18.5	7.9	33.9	7.4	7.3
LnGrp Delay(d),s/veh	21.7	23.1	68.9	23.8	79.2	84.2
LnGrp LOS	C	C	E	C	E	F
Approach Vol, veh/h	1635			1591	392	
Approach Delay, s/veh	22.4			30.3	81.7	
Approach LOS	C			C	F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	18.0	55.4				73.4		16.1
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	13.4	49.7				67.7		11.5
Max Q Clear Time (g_c+I1), s	13.9	36.4				58.0		12.5
Green Ext Time (p_c), s	0.0	12.5				9.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	32.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	220.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	281	856	93	22	704	14	84	16	22	127	25	384
Future Vol, veh/h	281	856	93	22	704	14	84	16	22	127	25	384
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	299	911	99	23	749	15	89	17	23	135	27	409

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	764	0	0	1014	0	0	2583	2373	509	1865	2414	756
Stage 1	-	-	-	-	-	-	1562	1562	-	803	803	-
Stage 2	-	-	-	-	-	-	1021	811	-	1062	1611	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	858	-	-	692	-	-	~ 15	35	515	~ 51	33	411
Stage 1	-	-	-	-	-	-	119	174	-	380	399	-
Stage 2	-	-	-	-	-	-	288	396	-	242	165	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	858	-	-	692	-	-	0	22	513	~ 27	~ 21	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	95	54	-	~ 77	68	-
Stage 1	-	-	-	-	-	-	~ 77	113	-	248	386	-
Stage 2	-	-	-	-	-	-	~ 2	383	-	~ 128	107	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.3	267.8	$ 1012.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	100	858	-	-	692	-	-	182
HCM Lane V/C Ratio	1.298	0.348	-	-	0.034	-	-	3.133
HCM Control Delay (s)	267.8	11.4	-	-	10.4	-	-	$ 1012.9
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	9.1	1.6	-	-	0.1	-	-	52.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1398.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	281	1106	93	22	1012	116	84	16	22	377	25	384
Future Vol, veh/h	281	1106	93	22	1012	116	84	16	22	377	25	384
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	299	1177	99	23	1077	123	89	17	23	401	27	409

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1200	0	0	1280	0	0	3231	3075	642	2380	3062	1138
Stage 1	-	-	-	-	-	-	1828	1828	-	1185	1185	-
Stage 2	-	-	-	-	-	-	1403	1247	-	1195	1877	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	589	-	-	549	-	-	~ 5	~ 12	422	~ 21	~ 13	~ 248
Stage 1	-	-	-	-	-	-	~ 81	129	-	~ 233	265	-
Stage 2	-	-	-	-	-	-	175	247	-	~ 201	122	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	589	-	-	549	-	-	-	~ 6	420	~ 11	~ 6	~ 248
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 42	327	-	~ 33	31	-
Stage 1	-	-	-	-	-	-	~ 40	63	-	~ 115	254	-
Stage 2	-	-	-	-	-	-	-	237	-	~ 68	60	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.3	0.2		$ 6286.5
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	589	-	-	549	-	-	57
HCM Lane V/C Ratio	-	0.508	-	-	0.043	-	-	14.67
HCM Control Delay (s)	-	17.2	-	-	11.8	-	-	$ 6286.5
HCM Lane LOS	-	C	-	-	B	-	-	F
HCM 95th %tile Q(veh)	-	2.9	-	-	0.1	-	-	100.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	927	47	23	640	2	29	0	15	11	0	71
Future Vol, veh/h	30	927	47	23	640	2	29	0	15	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	1053	53	26	727	2	33	0	17	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	729	0	0	1107	0	0	1964	1927	553	1373	1953	728
Stage 1	-	-	-	-	-	-	1145	1145	-	781	781	-
Stage 2	-	-	-	-	-	-	819	782	-	592	1172	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	884	-	-	638	-	-	43	67	482	115	65	427
Stage 1	-	-	-	-	-	-	216	277	-	391	408	-
Stage 2	-	-	-	-	-	-	372	408	-	465	269	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	884	-	-	638	-	-	33	62	482	104	60	427
Mov Cap-2 Maneuver	-	-	-	-	-	-	155	210	-	104	60	-
Stage 1	-	-	-	-	-	-	208	267	-	376	391	-
Stage 2	-	-	-	-	-	-	292	391	-	432	259	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	28.6	21.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	202	884	-	-	638	-	-	301
HCM Lane V/C Ratio	0.248	0.037	-	-	0.041	-	-	0.296
HCM Control Delay (s)	28.6	9.2	-	-	10.9	-	-	21.9
HCM Lane LOS	D	A	-	-	B	-	-	C
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	1.2

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	1427	47	23	1050	2	29	0	15	11	0	71
Future Vol, veh/h	30	1427	47	23	1050	2	29	0	15	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	1622	53	26	1193	2	33	0	17	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1195	0	0	1675	0	0	2999	2962	838	2123	2987	1194
Stage 1	-	-	-	-	-	-	1714	1714	-	1247	1247	-
Stage 2	-	-	-	-	-	-	1285	1248	-	876	1740	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	591	-	-	388	-	-	~ 7	15	314	33	14	230
Stage 1	-	-	-	-	-	-	96	147	-	215	247	-
Stage 2	-	-	-	-	-	-	204	247	-	314	143	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	591	-	-	388	-	-	~ 4	13	314	28	12	230
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	106	-	28	12	-
Stage 1	-	-	-	-	-	-	91	139	-	203	230	-
Stage 2	-	-	-	-	-	-	126	230	-	280	135	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	101.7	98
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	82	591	-	-	388	-	-	117
HCM Lane V/C Ratio	0.61	0.055	-	-	0.067	-	-	0.762
HCM Control Delay (s)	101.7	11.4	-	-	14.9	-	-	98
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	2.8	0.2	-	-	0.2	-	-	4.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	154
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	186	299	469	0	110	341	37	0	201	175	148
Future Vol, veh/h	0	186	299	469	0	110	341	37	0	201	175	148
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	200	322	504	0	118	367	40	0	216	188	159
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	3
HCM Control Delay	179	142.5	107.2
HCM LOS	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	54%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	46%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	201	323	186	299	469	110	341	37	43	367	124
LT Vol	201	0	186	0	0	110	0	0	43	0	0
Through Vol	0	175	0	299	0	0	341	0	0	367	0
RT Vol	0	148	0	0	469	0	0	37	0	0	124
Lane Flow Rate	216	347	200	322	504	118	367	40	46	395	133
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.774	1.166	0.671	1.035	1.526	0.433	1.292	0.133	0.169	1.388	0.443
Departure Headway (Hd)	13.499	12.678	13.578	13.049	12.308	14.269	13.743	13.005	14.137	13.617	12.889
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	270	288	268	280	298	254	268	277	255	268	281
Service Time	11.199	10.378	11.278	10.749	10.008	11.969	11.443	10.705	11.837	11.317	10.589
HCM Lane V/C Ratio	0.8	1.205	0.746	1.15	1.691	0.465	1.369	0.144	0.18	1.474	0.473
HCM Control Delay	50.7	142.4	40.1	102	283.2	27.4	193.1	17.7	19.7	230.6	25.5
HCM Lane LOS	F	F	E	F	F	D	F	C	C	F	D
HCM 95th-tile Q	5.8	14.5	4.4	11	25.7	2.1	17	0.5	0.6	19.8	2.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	43	367	124
Future Vol, veh/h	0	43	367	124
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	46	395	133
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	166
HCM LOS	F

Intersection	
Intersection Delay, s/veh	601.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	186	999	269	0	503	751	37	0	201	175	448
Future Vol, veh/h	0	186	999	269	0	503	751	37	0	201	175	448
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	200	1074	289	0	541	808	40	0	216	188	482
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	907.4	703	194.9
HCM LOS	F	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	201	175	448	186	999	269	503	751	37	43	367
LT Vol	201	0	0	186	0	0	503	0	0	43	0
Through Vol	0	175	0	0	999	0	0	751	0	0	367
RT Vol	0	0	448	0	0	269	0	0	37	0	0
Lane Flow Rate	216	188	482	200	1074	289	541	808	40	46	395
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.804	0.674	1.632	0.733	3.791	0.965	1.999	2.874	0.134	0.175	1.438
Departure Headway (Hd)	11.813	11.313	10.613	13.837	13.337	12.637	13.54	13.04	12.34	3.296	2.796
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	309	322	347	264	290	289	276	291	292	1093	1294
Service Time	9.513	9.013	8.313	11.537	11.037	10.337	11.24	10.74	10.04	0.996	0.496
HCM Lane V/C Ratio	0.699	0.584	1.389	0.758	3.703	1	1.96	2.777	0.137	0.042	0.305
HCM Control Delay	49.3	34.5	322.9	46.9	1289.8	82	491.4	878.6	16.9	6.7	211.4
HCM Lane LOS	E	D	F	E	F	F	F	F	C	A	F
HCM 95th-tile Q	6.6	4.6	33.1	5.2	98.1	9.5	38.4	69	0.5	0.6	79.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	43	367	124
Future Vol, veh/h	0	43	367	124
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	46	395	133
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	147.4
HCM LOS	F

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	744	875	1439	730	1052	1978	
Future Volume (vph)	744	875	1439	730	1052	1978	
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA	
Protected Phases	3	1	2	3	1	6	8
Permitted Phases		8		2			
Detector Phase	3	1	2	3	1	6	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0	36.3
Total Split (s)	36.3	37.0	46.7	36.3	37.0	83.7	36.3
Total Split (%)	30.3%	30.8%	38.9%	30.3%	30.8%	69.8%	30%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0	
Lead/Lag		Lead	Lag		Lead		
Lead-Lag Optimize?		Yes	Yes		Yes		
Recall Mode	None	None	Min	None	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	744	0	875	0	1439	730	1052	1978	0
Future Volume (veh/h)	0	0	0	744	0	875	0	1439	730	1052	1978	0
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	0	1900	0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h				836	0	941	0	1617	820	1182	2222	0
Adj No. of Lanes				1	0	1	0	1	1	1	1	0
Peak Hour Factor				0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				466	0	846	0	659	976	481	1243	0
Arrive On Green				0.26	0.00	0.26	0.00	0.35	0.35	0.27	0.65	0.00
Sat Flow, veh/h				1810	0	1615	0	1900	1615	1810	1900	0
Grp Volume(v), veh/h				836	0	941	0	1617	820	1182	2222	0
Grp Sat Flow(s),veh/h/ln				1810	0	1615	0	1900	1615	1810	1900	0
Q Serve(g_s), s				31.0	0.0	31.0	0.0	41.7	41.7	32.0	78.7	0.0
Cycle Q Clear(g_c), s				31.0	0.0	31.0	0.0	41.7	41.7	32.0	78.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h				466	0	846	0	659	976	481	1243	0
V/C Ratio(X)				1.79	0.00	1.11	0.00	2.46	0.84	2.46	1.79	0.00
Avail Cap(c_a), veh/h				466	0	846	0	659	976	481	1243	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				44.6	0.0	28.7	0.0	39.3	19.1	44.2	20.8	0.0
Incr Delay (d2), s/veh				365.3	0.0	66.7	0.0	659.4	6.8	661.3	357.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				62.7	0.0	43.5	0.0	142.4	23.6	104.3	164.2	0.0
LnGrp Delay(d),s/veh				410.0	0.0	95.3	0.0	698.7	25.9	705.4	378.5	0.0
LnGrp LOS				F		F		F	C	F	F	
Approach Vol, veh/h					1777			2437			3404	
Approach Delay, s/veh					243.3			472.3			492.0	
Approach LOS					F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	37.0	47.0				84.0		36.3
Change Period (Y+Rc), s	5.0	5.3				* 5.3		5.3
Max Green Setting (Gmax), s	32.0	41.4				* 79		31.0
Max Q Clear Time (g_c+I1), s	34.0	43.7				80.7		33.0
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0

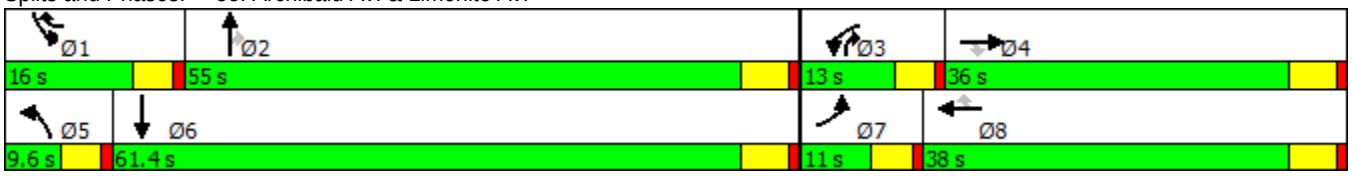
Intersection Summary		
HCM 2010 Ctrl Delay		427.7
HCM 2010 LOS		F

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	285	699	108	444	601	1176	82	1439	380	703	1978
Future Volume (vph)	285	699	108	444	601	1176	82	1439	380	703	1978
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	1	5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	1	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0
Minimum Split (s)	9.6	33.3	33.3	9.6	33.3	9.6	9.6	46.3	9.6	9.6	46.3
Total Split (s)	11.0	36.0	36.0	13.0	38.0	16.0	9.6	55.0	13.0	16.0	61.4
Total Split (%)	9.2%	30.0%	30.0%	10.8%	31.7%	13.3%	8.0%	45.8%	10.8%	13.3%	51.2%
Yellow Time (s)	3.6	4.3	4.3	3.6	4.3	3.6	3.6	4.3	3.6	3.6	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.3	5.3	4.6	5.3	4.6	4.6	5.3	4.6	4.6	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	699	108	444	601	1176	82	1439	380	703	1978	237
Future Volume (veh/h)	285	699	108	444	601	1176	82	1439	380	703	1978	237
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	310	760	117	499	653	1279	89	1617	427	790	2222	258
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	486	413	127	518	594	75	787	782	172	781	91
Arrive On Green	0.05	0.26	0.26	0.07	0.27	0.27	0.04	0.41	0.41	0.09	0.47	0.47
Sat Flow, veh/h	1810	1900	1615	1810	1900	1615	1810	1900	1615	1810	1672	194
Grp Volume(v), veh/h	310	760	117	499	653	1279	89	1617	427	790	0	2480
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1810	1900	1615	1810	1900	1615	1810	0	1866
Q Serve(g_s), s	6.4	30.7	7.0	8.4	32.7	32.7	5.0	49.7	22.2	11.4	0.0	56.1
Cycle Q Clear(g_c), s	6.4	30.7	7.0	8.4	32.7	32.7	5.0	49.7	22.2	11.4	0.0	56.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	97	486	413	127	518	594	75	787	782	172	0	872
V/C Ratio(X)	3.21	1.56	0.28	3.94	1.26	2.15	1.18	2.05	0.55	4.60	0.00	2.84
Avail Cap(c_a), veh/h	97	486	413	127	518	594	75	787	782	172	0	872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.8	44.7	35.8	55.8	43.6	38.0	57.5	35.2	21.7	54.3	0.0	32.0
Incr Delay (d2), s/veh	1021.9	263.5	0.4	1341.5	132.4	525.3	160.3	479.1	0.9	1631.3	0.0	832.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.6	51.6	3.1	51.4	36.2	106.2	5.8	130.7	10.0	83.6	0.0	230.6
LnGrp Delay(d),s/veh	1078.7	308.1	36.2	1397.3	176.1	563.3	217.8	514.2	22.6	1685.6	0.0	864.6
LnGrp LOS	F	F	D	F	F	F	F	F	C	F		F
Approach Vol, veh/h		1187			2431			2133			3270	
Approach Delay, s/veh		482.6			630.5			403.5			1062.9	
Approach LOS		F			F			F			F	

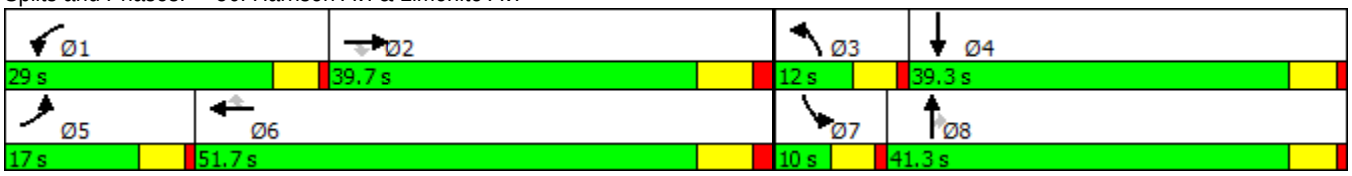
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	55.0	13.0	36.0	9.6	61.4	11.0	38.0
Change Period (Y+Rc), s	4.6	5.3	4.6	5.3	4.6	5.3	4.6	5.3
Max Green Setting (Gmax), s	11.4	49.7	8.4	30.7	5.0	56.1	6.4	32.7
Max Q Clear Time (g_c+I1), s	13.4	51.7	10.4	32.7	7.0	58.1	8.4	34.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	714.1
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	78	1894	210	251	1942	93	135	58	157	109	109
Future Volume (vph)	78	1894	210	251	1942	93	135	58	157	109	109
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	17.0	39.7	39.7	29.0	51.7	51.7	12.0	41.3	41.3	10.0	39.3
Total Split (%)	14.2%	33.1%	33.1%	24.2%	43.1%	43.1%	10.0%	34.4%	34.4%	8.3%	32.8%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 102.5
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1894	210	251	1942	93	135	58	157	109	109	144
Future Volume (veh/h)	78	1894	210	251	1942	93	135	58	157	109	109	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	2104	232	279	2158	103	150	64	145	121	121	153
Adj No. of Lanes	1	3	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	111	1754	535	312	1620	725	127	409	343	91	147	186
Arrive On Green	0.06	0.34	0.34	0.17	0.45	0.45	0.07	0.22	0.22	0.05	0.20	0.20
Sat Flow, veh/h	1810	5187	1581	1810	3610	1615	1810	1900	1592	1810	754	953
Grp Volume(v), veh/h	87	2104	232	279	2158	103	150	64	145	121	0	274
Grp Sat Flow(s),veh/h/ln	1810	1729	1581	1810	1805	1615	1810	1900	1592	1810	0	1707
Q Serve(g_s), s	4.7	33.7	11.3	15.0	44.7	3.7	7.0	2.7	7.8	5.0	0.0	15.3
Cycle Q Clear(g_c), s	4.7	33.7	11.3	15.0	44.7	3.7	7.0	2.7	7.8	5.0	0.0	15.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	111	1754	535	312	1620	725	127	409	343	91	0	333
V/C Ratio(X)	0.78	1.20	0.43	0.89	1.33	0.14	1.18	0.16	0.42	1.33	0.00	0.82
Avail Cap(c_a), veh/h	218	1754	535	436	1620	725	127	687	576	91	0	583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.1	33.0	25.6	40.3	27.4	16.2	46.3	31.7	33.7	47.3	0.0	38.4
Incr Delay (d2), s/veh	4.4	95.6	0.6	13.0	153.6	0.1	135.9	0.2	0.8	206.7	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	31.4	5.0	8.6	56.6	1.7	8.3	1.4	3.5	7.7	0.0	7.7
LnGrp Delay(d),s/veh	50.5	128.5	26.1	53.3	181.1	16.2	182.2	31.9	34.6	254.0	0.0	43.5
LnGrp LOS	D	F	C	D	F	B	F	C	C	F		D
Approach Vol, veh/h		2423			2540			359			395	
Approach Delay, s/veh		115.9			160.3			95.8			108.0	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.2	40.7	12.0	24.7	11.1	51.7	10.0	26.7
Change Period (Y+Rc), s	5.0	7.0	5.0	5.3	5.0	7.0	5.0	5.3
Max Green Setting (Gmax), s	24.0	32.7	7.0	34.0	12.0	44.7	5.0	36.0
Max Q Clear Time (g_c+I1), s	17.0	35.7	9.0	17.3	6.7	46.7	7.0	9.8
Green Ext Time (p_c), s	0.1	0.0	0.0	2.1	0.0	0.0	0.0	2.4

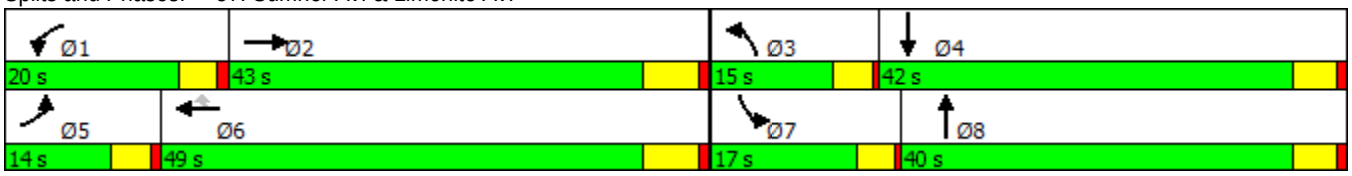
Intersection Summary	
HCM 2010 Ctrl Delay	133.8
HCM 2010 LOS	F

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	114	1579	489	1868	66	422	79	93	166
Future Volume (vph)	114	1579	489	1868	66	422	79	93	166
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	1	6		3	8	7	4
Permitted Phases					6				
Detector Phase	5	2	1	6	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	14.0	43.0	20.0	49.0	49.0	15.0	40.0	17.0	42.0
Total Split (%)	11.7%	35.8%	16.7%	40.8%	40.8%	12.5%	33.3%	14.2%	35.0%
Yellow Time (s)	3.5	5.0	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.2
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	1579	541	489	1868	66	422	79	321	93	166	88
Future Volume (veh/h)	114	1579	541	489	1868	66	422	79	321	93	166	88
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	118	1628	552	504	1926	47	435	81	257	96	171	64
Adj No. of Lanes	2	3	0	2	3	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	181	1441	476	550	2483	773	201	371	330	122	419	151
Arrive On Green	0.05	0.37	0.37	0.16	0.48	0.48	0.11	0.21	0.21	0.07	0.16	0.16
Sat Flow, veh/h	3510	3857	1274	3510	5187	1614	1810	1805	1608	1810	2589	931
Grp Volume(v), veh/h	118	1455	725	504	1926	47	435	81	257	96	117	118
Grp Sat Flow(s),veh/h/ln	1755	1729	1673	1755	1729	1614	1810	1805	1608	1810	1805	1715
Q Serve(g_s), s	3.3	37.0	37.0	14.0	30.5	1.5	11.0	3.7	15.0	5.2	5.8	6.1
Cycle Q Clear(g_c), s	3.3	37.0	37.0	14.0	30.5	1.5	11.0	3.7	15.0	5.2	5.8	6.1
Prop In Lane	1.00		0.76	1.00		1.00	1.00		1.00	1.00		0.54
Lane Grp Cap(c), veh/h	181	1292	625	550	2483	773	201	371	330	122	292	277
V/C Ratio(X)	0.65	1.13	1.16	0.92	0.78	0.06	2.16	0.22	0.78	0.79	0.40	0.43
Avail Cap(c_a), veh/h	337	1292	625	550	2483	773	201	638	568	238	675	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.1	31.0	31.0	41.1	21.4	13.9	44.0	32.7	37.2	45.5	37.2	37.4
Incr Delay (d2), s/veh	1.5	67.2	88.8	20.0	1.6	0.0	539.8	0.2	3.0	4.1	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	29.6	32.4	8.3	14.8	0.7	35.6	1.9	6.9	2.7	2.9	3.0
LnGrp Delay(d),s/veh	47.6	98.2	119.8	61.1	23.0	13.9	583.8	33.0	40.2	49.6	37.9	38.1
LnGrp LOS	D	F	F	E	C	B	F	C	D	D	D	D
Approach Vol, veh/h		2298			2477			773			331	
Approach Delay, s/veh		102.4			30.6			345.4			41.4	
Approach LOS		F			C			F			D	

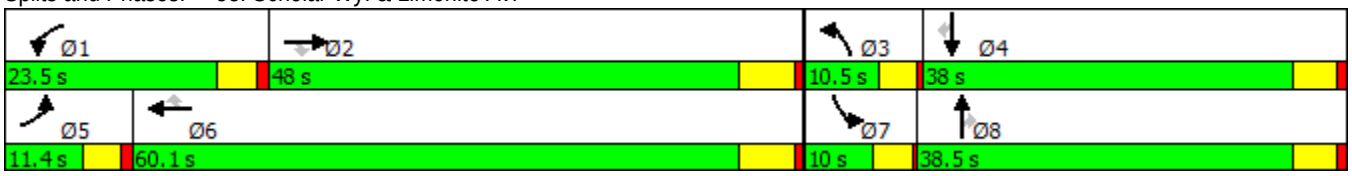
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	43.0	15.0	21.0	9.6	53.4	10.7	25.3
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	15.5	37.0	11.0	37.0	9.5	43.0	13.0	35.0
Max Q Clear Time (g_c+I1), s	16.0	39.0	13.0	8.1	5.3	32.5	7.2	17.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.7	0.0	10.3	0.0	2.4

Intersection Summary		
HCM 2010 Ctrl Delay		100.6
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1528	197	214	2053	47	271	34	186	34	95	66
Future Volume (vph)	65	1528	197	214	2053	47	271	34	186	34	95	66
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	11.4	48.0	48.0	23.5	60.1	60.1	10.5	38.5	38.5	10.0	38.0	38.0
Total Split (%)	9.5%	40.0%	40.0%	19.6%	50.1%	50.1%	8.8%	32.1%	32.1%	8.3%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 97.2
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1528	197	214	2053	47	271	34	186	34	95	66
Future Volume (veh/h)	65	1528	197	214	2053	47	271	34	186	34	95	66
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	1559	199	218	2095	48	277	35	142	35	97	64
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	85	1794	791	254	2129	931	128	236	200	47	286	126
Arrive On Green	0.05	0.50	0.50	0.14	0.59	0.59	0.07	0.12	0.12	0.03	0.08	0.08
Sat Flow, veh/h	1810	3610	1592	1810	3610	1578	1810	1900	1611	1810	3610	1585
Grp Volume(v), veh/h	66	1559	199	218	2095	48	277	35	142	35	97	64
Grp Sat Flow(s),veh/h/ln	1810	1805	1592	1810	1805	1578	1810	1900	1611	1810	1805	1585
Q Serve(g_s), s	3.3	35.0	6.6	10.8	52.0	1.2	6.5	1.5	7.8	1.8	2.3	3.5
Cycle Q Clear(g_c), s	3.3	35.0	6.6	10.8	52.0	1.2	6.5	1.5	7.8	1.8	2.3	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	1794	791	254	2129	931	128	236	200	47	286	126
V/C Ratio(X)	0.77	0.87	0.25	0.86	0.98	0.05	2.16	0.15	0.71	0.75	0.34	0.51
Avail Cap(c_a), veh/h	136	1794	791	375	2132	932	128	695	589	119	1300	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	20.4	13.2	38.5	18.4	7.9	42.6	35.8	38.5	44.3	39.9	40.5
Incr Delay (d2), s/veh	5.5	4.9	0.2	8.8	15.8	0.0	545.8	0.2	3.4	8.7	0.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	18.5	2.9	6.0	30.3	0.5	22.7	0.8	3.6	1.0	1.2	1.6
LnGrp Delay(d),s/veh	48.6	25.3	13.4	47.3	34.2	8.0	588.4	36.0	41.9	53.0	40.4	42.8
LnGrp LOS	D	C	B	D	C	A	F	D	D	D	D	D
Approach Vol, veh/h		1824			2361			454			196	
Approach Delay, s/veh		24.8			34.8			374.9			43.5	
Approach LOS		C			C			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	51.5	10.5	12.3	8.8	60.0	6.4	16.4
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	19.0	42.0	6.5	33.0	6.9	54.1	6.0	33.5
Max Q Clear Time (g_c+I1), s	12.8	37.0	8.5	5.5	5.3	54.0	3.8	9.8
Green Ext Time (p_c), s	0.1	4.9	0.0	1.0	0.0	0.1	0.0	1.0

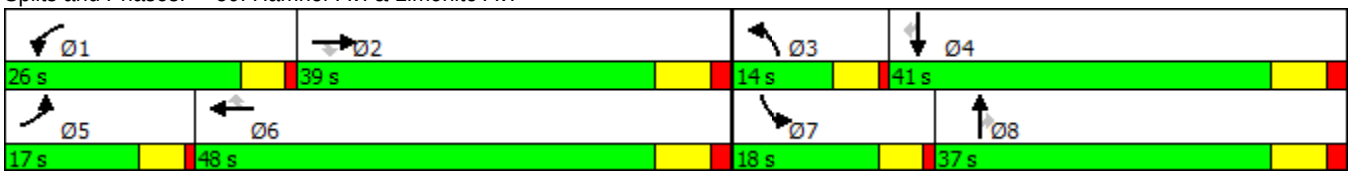
Intersection Summary	
HCM 2010 Ctrl Delay	63.3
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	1073	185	362	1369	648	237	1010	363	633	983	413
Future Volume (vph)	332	1073	185	362	1369	648	237	1010	363	633	983	413
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0
Total Split (s)	17.0	39.0	39.0	26.0	48.0	48.0	14.0	37.0	37.0	18.0	41.0	41.0
Total Split (%)	14.2%	32.5%	32.5%	21.7%	40.0%	40.0%	11.7%	30.8%	30.8%	15.0%	34.2%	34.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	332	1073	185	362	1369	648	237	1010	363	633	983	413
Future Volume (veh/h)	332	1073	185	362	1369	648	237	1010	363	633	983	413
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	339	1095	170	369	1397	592	242	1031	293	646	1003	380
Adj No. of Lanes	2	3	1	2	2	1	2	3	1	2	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	351	1658	504	429	1233	550	263	1297	393	380	1023	457
Arrive On Green	0.10	0.32	0.32	0.12	0.34	0.34	0.08	0.25	0.25	0.11	0.28	0.28
Sat Flow, veh/h	3510	5187	1579	3510	3610	1611	3510	5187	1572	3510	3610	1612
Grp Volume(v), veh/h	339	1095	170	369	1397	592	242	1031	293	646	1003	380
Grp Sat Flow(s),veh/h/ln	1755	1729	1579	1755	1805	1611	1755	1729	1572	1755	1805	1612
Q Serve(g_s), s	11.5	21.8	9.9	12.4	41.0	41.0	8.2	22.3	20.6	13.0	33.1	26.5
Cycle Q Clear(g_c), s	11.5	21.8	9.9	12.4	41.0	41.0	8.2	22.3	20.6	13.0	33.1	26.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	351	1658	504	429	1233	550	263	1297	393	380	1023	457
V/C Ratio(X)	0.97	0.66	0.34	0.86	1.13	1.08	0.92	0.80	0.75	1.70	0.98	0.83
Avail Cap(c_a), veh/h	351	1658	504	614	1233	550	263	1297	393	380	1023	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	35.2	31.1	51.7	39.5	39.5	55.1	42.1	41.5	53.5	42.7	40.3
Incr Delay (d2), s/veh	38.6	1.3	0.8	6.3	70.3	60.3	34.1	4.0	9.0	325.5	23.6	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	10.6	4.4	6.4	32.4	27.4	5.2	11.2	9.9	23.5	19.8	13.5
LnGrp Delay(d),s/veh	92.4	36.5	32.0	57.9	109.8	99.8	89.3	46.1	50.5	379.0	66.2	53.9
LnGrp LOS	F	D	C	E	F	F	F	D	D	F	E	D
Approach Vol, veh/h		1604			2358			1566			2029	
Approach Delay, s/veh		47.9			99.2			53.6			163.5	
Approach LOS		D			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	45.3	14.0	41.0	17.0	48.0	18.0	37.0
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	21.0	32.0	9.0	34.0	12.0	41.0	13.0	30.0
Max Q Clear Time (g_c+I1), s	14.4	23.8	10.2	35.1	13.5	43.0	15.0	24.3
Green Ext Time (p_c), s	0.3	8.1	0.0	0.0	0.0	0.0	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	96.1
HCM 2010 LOS	F

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1643	687	913	2207	517	0	503
Future Volume (vph)	1643	687	913	2207	517	0	503
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	36.5	23.5	23.5	23.5
Total Split (s)	55.0	55.0	23.0	78.0	32.0	32.0	32.0
Total Split (%)	50.0%	50.0%	20.9%	70.9%	29.1%	29.1%	29.1%
Yellow Time (s)	4.5	4.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	Min	Min	Min

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 50 (45%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1643	687	913	2207	0	0	0	0	517	0	503
Future Volume (veh/h)	0	1643	687	913	2207	0	0	0	0	517	0	503
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1694	708	941	2275	0				668	0	288
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1746	781	590	2501	0				750	0	335
Arrive On Green	0.00	0.48	0.48	0.22	0.92	0.00				0.21	0.00	0.21
Sat Flow, veh/h	0	3705	1615	3510	3705	0				3619	0	1615
Grp Volume(v), veh/h	0	1694	708	941	2275	0				668	0	288
Grp Sat Flow(s),veh/h/ln	0	1805	1615	1755	1805	0				1810	0	1615
Q Serve(g_s), s	0.0	50.2	44.3	18.5	33.6	0.0				19.7	0.0	18.9
Cycle Q Clear(g_c), s	0.0	50.2	44.3	18.5	33.6	0.0				19.7	0.0	18.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1746	781	590	2501	0				750	0	335
V/C Ratio(X)	0.00	0.97	0.91	1.59	0.91	0.00				0.89	0.00	0.86
Avail Cap(c_a), veh/h	0	1746	781	590	2501	0				872	0	389
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.13	0.13	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.6	26.1	42.7	2.6	0.0				42.4	0.0	42.1
Incr Delay (d2), s/veh	0.0	3.3	2.6	268.0	0.6	0.0				9.4	0.0	14.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	25.7	20.2	30.9	14.8	0.0				10.8	0.0	9.8
LnGrp Delay(d),s/veh	0.0	31.0	28.7	310.7	3.3	0.0				51.8	0.0	56.3
LnGrp LOS		C	C	F	A					D		E
Approach Vol, veh/h		2402			3216						956	
Approach Delay, s/veh		30.3			93.2						53.1	
Approach LOS		C			F						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.0	58.7		28.3		81.7		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	18.5	49.5		26.5		72.5		
Max Q Clear Time (g_c+I1), s	20.5	52.2		21.7		35.6		
Green Ext Time (p_c), s	0.0	0.0		1.0		32.6		

Intersection Summary	
HCM 2010 Ctrl Delay	64.4
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	240	1920	2523	480	597	0	910
Future Volume (vph)	240	1920	2523	480	597	0	910
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	26.0	72.0	46.0	46.0	38.0	38.0	38.0
Total Split (%)	23.6%	65.5%	41.8%	41.8%	34.5%	34.5%	34.5%
Yellow Time (s)	4.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	1920	0	0	2523	480	597	0	910	0	0	0
Future Volume (veh/h)	240	1920	0	0	2523	480	597	0	910	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	242	1939	0	0	2548	456	830	0	444			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	319	2195	0	0	1719	759	1056	0	471			
Arrive On Green	0.09	0.61	0.00	0.00	0.48	0.48	0.29	0.00	0.29			
Sat Flow, veh/h	3510	3705	0	0	3705	1594	3619	0	1613			
Grp Volume(v), veh/h	242	1939	0	0	2548	456	830	0	444			
Grp Sat Flow(s),veh/h/ln	1755	1805	0	0	1805	1594	1810	0	1613			
Q Serve(g_s), s	7.4	50.0	0.0	0.0	52.4	23.1	23.2	0.0	29.6			
Cycle Q Clear(g_c), s	7.4	50.0	0.0	0.0	52.4	23.1	23.2	0.0	29.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	319	2195	0	0	1719	759	1056	0	471			
V/C Ratio(X)	0.76	0.88	0.00	0.00	1.48	0.60	0.79	0.00	0.94			
Avail Cap(c_a), veh/h	686	2195	0	0	1719	759	1069	0	477			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.8	18.3	0.0	0.0	28.8	21.1	35.8	0.0	38.0			
Incr Delay (d2), s/veh	0.3	0.6	0.0	0.0	220.0	3.5	3.9	0.0	27.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.6	24.9	0.0	0.0	78.6	10.9	12.1	0.0	16.8			
LnGrp Delay(d),s/veh	49.2	18.8	0.0	0.0	248.8	24.6	39.7	0.0	65.3			
LnGrp LOS	D	B			F	C	D		E			
Approach Vol, veh/h		2181			3004			1274				
Approach Delay, s/veh		22.2			214.8			48.6				
Approach LOS		C			F			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		72.4			14.5	57.9		37.6
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		66.5			21.5	40.5		32.5
Max Q Clear Time (g_c+I1), s		52.0			9.4	54.4		31.6
Green Ext Time (p_c), s		14.0			0.6	0.0		0.5

Intersection Summary		
HCM 2010 Ctrl Delay		117.0
HCM 2010 LOS		F

Notes

APPENDIX 9.2:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1450	514	28	1256	671	133	389
Future Volume (vph)	1450	514	28	1256	671	133	389
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	26.5	26.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.44	0.44	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.52	0.53	0.20	0.71	0.75	0.72	0.65
Control Delay	13.9	4.0	28.5	9.2	29.1	26.7	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	4.0	28.5	9.2	29.1	26.7	17.6
LOS	B	A	C	A	C	C	B
Approach Delay	11.3			9.6		24.5	
Approach LOS	B			A		C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1450	514	28	1256	0	0	0	0	671	133	389
Future Volume (veh/h)	0	1450	514	28	1256	0	0	0	0	671	133	389
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0				1800	1900	1900
Adj Flow Rate, veh/h	0	1495	460	29	1295	0				790	0	0
Adj No. of Lanes	0	4	1	1	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2569	634	55	1835	0				1143	0	538
Arrive On Green	0.00	0.39	0.39	0.04	0.68	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	6802	1614	1714	3705	0				3429	0	1615
Grp Volume(v), veh/h	0	1495	460	29	1295	0				790	0	0
Grp Sat Flow(s),veh/h/ln	0	1634	1614	1714	1805	0				1714	0	1615
Q Serve(g_s), s	0.0	10.8	14.5	1.0	13.3	0.0				12.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.8	14.5	1.0	13.3	0.0				12.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2569	634	55	1835	0				1143	0	538
V/C Ratio(X)	0.00	0.58	0.73	0.53	0.71	0.00				0.69	0.00	0.00
Avail Cap(c_a), veh/h	0	2569	634	143	1835	0				1143	0	538
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.18	0.18	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	14.3	15.5	28.3	6.9	0.0				17.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	4.1	0.5	0.4	0.0				3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.9	7.1	0.5	6.4	0.0				6.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	14.7	19.6	28.8	7.4	0.0				20.8	0.0	0.0
LnGrp LOS		B	B	C	A					C		
Approach Vol, veh/h		1955			1324						790	
Approach Delay, s/veh		15.8			7.8						20.8	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	6.9	28.1		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	3.0	16.5		14.0		15.3		
Green Ext Time (p_c), s	0.0	3.8		1.3		13.9		

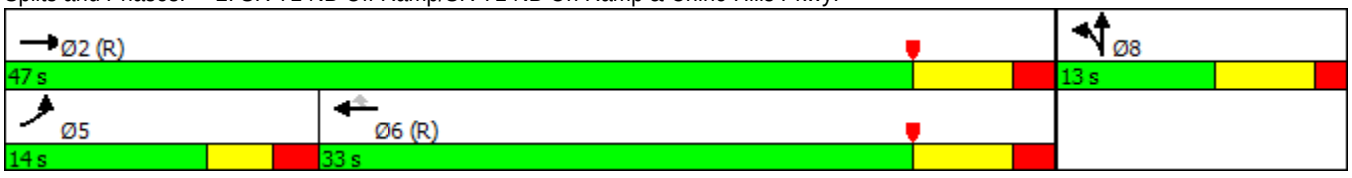
Intersection Summary	
HCM 2010 Ctrl Delay	14.2
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	729	1392	774	440	510	261
Future Volume (vph)	729	1392	774	440	510	261
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	14.0	47.0	33.0	33.0	13.0	13.0
Total Split (%)	23.3%	78.3%	55.0%	55.0%	21.7%	21.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	9.0	40.5	26.5	26.5	7.0	7.0
Actuated g/C Ratio	0.15	0.68	0.44	0.44	0.12	0.12
v/c Ratio	1.64	0.60	0.51	0.59	1.96	1.62
Control Delay	317.7	7.2	13.5	12.2	471.6	313.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	317.7	7.2	13.5	12.2	471.6	313.8
LOS	F	A	B	B	F	F
Approach Delay		113.9	13.0			366.9
Approach LOS		F	B			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 35 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.96	
Intersection Signal Delay: 144.0	Intersection LOS: F
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	729	1392	0	0	774	440	510	261	228	0	0	0
Future Volume (veh/h)	729	1392	0	0	774	440	510	261	228	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1900	0	0	1900	1900	1800	1900	1900			
Adj Flow Rate, veh/h	767	1465	0	0	815	462	350	537	237			
Adj No. of Lanes	2	2	0	0	2	1	1	2	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	471	2437	0	0	1594	702	200	292	129			
Arrive On Green	0.15	0.68	0.00	0.00	0.44	0.44	0.12	0.12	0.12			
Sat Flow, veh/h	3141	3705	0	0	3705	1590	1714	2504	1102			
Grp Volume(v), veh/h	767	1465	0	0	815	462	350	407	367			
Grp Sat Flow(s),veh/h/ln	1570	1805	0	0	1805	1590	1714	1900	1706			
Q Serve(g_s), s	9.0	13.3	0.0	0.0	9.8	13.7	7.0	7.0	7.0			
Cycle Q Clear(g_c), s	9.0	13.3	0.0	0.0	9.8	13.7	7.0	7.0	7.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.65			
Lane Grp Cap(c), veh/h	471	2437	0	0	1594	702	200	222	199			
V/C Ratio(X)	1.63	0.60	0.00	0.00	0.51	0.66	1.75	1.84	1.84			
Avail Cap(c_a), veh/h	471	2437	0	0	1594	702	200	222	199			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.80	0.80	0.00	0.00	0.48	0.48	1.00	1.00	1.00			
Uniform Delay (d), s/veh	25.5	5.3	0.0	0.0	12.1	13.2	26.5	26.5	26.5			
Incr Delay (d2), s/veh	290.3	0.9	0.0	0.0	0.6	2.3	357.3	393.4	398.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	22.9	6.8	0.0	0.0	4.9	6.4	23.1	27.9	25.3			
LnGrp Delay(d),s/veh	315.8	6.2	0.0	0.0	12.6	15.5	383.8	419.9	425.2			
LnGrp LOS	F	A			B	B	F	F	F			
Approach Vol, veh/h		2232			1277			1124				
Approach Delay, s/veh		112.6			13.7			410.4				
Approach LOS		F			B			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.0			14.0	33.0		13.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		40.5			9.0	26.5		7.0
Max Q Clear Time (g_c+I1), s		15.3			11.0	15.7		9.0
Green Ext Time (p_c), s		19.7			0.0	9.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	157.6
HCM 2010 LOS	F

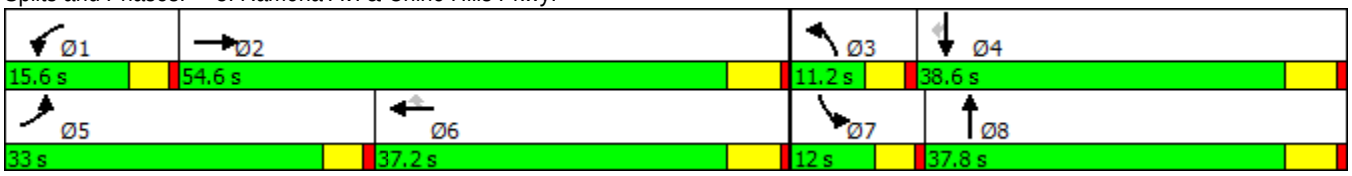
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	500	1111	142	860	127	28	459	119	369	327
Future Volume (vph)	500	1111	142	860	127	28	459	119	369	327
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	33.0	54.6	15.6	37.2	37.2	11.2	37.8	12.0	38.6	38.6
Total Split (%)	27.5%	45.5%	13.0%	31.0%	31.0%	9.3%	31.5%	10.0%	32.2%	32.2%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	28.4	48.8	11.0	31.4	31.4	6.0	32.0	7.4	37.3	37.3
Actuated g/C Ratio	0.24	0.41	0.09	0.26	0.26	0.05	0.27	0.06	0.31	0.31
v/c Ratio	1.30	0.56	0.96	0.96	0.25	0.34	0.73	1.19	0.35	0.47
Control Delay	190.7	28.6	115.8	64.8	5.2	65.7	41.9	195.8	34.1	5.9
Queue Delay	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	190.7	29.7	115.8	64.8	5.2	65.7	41.9	195.8	34.1	5.9
LOS	F	C	F	E	A	E	D	F	C	A
Approach Delay		79.4		64.5			42.8		46.4	
Approach LOS		E		E			D		D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 63.2 — Intersection LOS: E
Intersection Capacity Utilization 104.1% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	1111	9	142	860	127	28	459	207	119	369	327
Future Volume (veh/h)	500	1111	9	142	860	127	28	459	207	119	369	327
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	526	1169	8	149	905	117	29	483	150	125	388	248
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	406	2161	15	157	945	416	44	722	223	106	1092	480
Arrive On Green	0.24	0.41	0.41	0.09	0.26	0.26	0.03	0.27	0.27	0.06	0.30	0.30
Sat Flow, veh/h	1714	5315	36	1714	3610	1591	1714	2708	835	1714	3610	1587
Grp Volume(v), veh/h	526	761	416	149	905	117	29	321	312	125	388	248
Grp Sat Flow(s),veh/h/ln	1714	1729	1893	1714	1805	1591	1714	1805	1738	1714	1805	1587
Q Serve(g_s), s	28.4	20.1	20.1	10.4	29.6	7.0	2.0	19.0	19.3	7.4	10.1	15.5
Cycle Q Clear(g_c), s	28.4	20.1	20.1	10.4	29.6	7.0	2.0	19.0	19.3	7.4	10.1	15.5
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	406	1406	770	157	945	416	44	481	463	106	1092	480
V/C Ratio(X)	1.30	0.54	0.54	0.95	0.96	0.28	0.66	0.67	0.67	1.18	0.36	0.52
Avail Cap(c_a), veh/h	406	1406	770	157	945	416	94	481	463	106	1092	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	27.1	27.1	54.2	43.7	35.3	57.9	39.2	39.3	56.3	32.7	34.6
Incr Delay (d2), s/veh	150.6	0.5	1.0	55.9	19.9	0.5	6.0	7.1	7.6	144.7	0.9	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.4	9.6	10.6	7.4	17.4	3.1	1.0	10.4	10.3	7.7	5.1	7.3
LnGrp Delay(d),s/veh	196.4	27.6	28.1	110.1	63.6	35.8	63.9	46.4	47.0	201.0	33.6	38.5
LnGrp LOS	F	C	C	F	E	D	E	D	D	F	C	D
Approach Vol, veh/h		1703			1171			662			761	
Approach Delay, s/veh		79.9			66.7			47.4			62.7	
Approach LOS		E			E			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	54.6	7.7	42.1	33.0	37.2	12.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	11.0	48.8	6.6	32.8	28.4	31.4	7.4	32.0
Max Q Clear Time (g_c+I1), s	12.4	22.1	4.0	17.5	30.4	31.6	9.4	21.3
Green Ext Time (p_c), s	0.0	20.5	0.0	6.1	0.0	0.0	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	68.2
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1142	166	44	910	142	41
Future Vol, veh/h	1142	166	44	910	142	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1255	182	48	1000	156	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1255	0	1852	627
Stage 1	-	-	-	-	1255	-
Stage 2	-	-	-	-	597	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	561	-	~ 67	431
Stage 1	-	-	-	-	236	-
Stage 2	-	-	-	-	518	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	561	-	~ 61	431
Mov Cap-2 Maneuver	-	-	-	-	205	-
Stage 1	-	-	-	-	236	-
Stage 2	-	-	-	-	474	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	73.9
HCM LOS			F

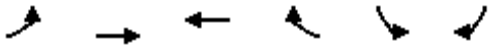
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	232	-	-	561	-
HCM Lane V/C Ratio	0.867	-	-	0.086	-
HCM Control Delay (s)	73.9	-	-	12	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	7	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	288	896	826	100	128
Future Volume (vph)	288	896	826	100	128
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	42.0	88.0	46.0	32.0	42.0
Total Split (%)	35.0%	73.3%	38.3%	26.7%	35.0%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	23.1	62.5	34.7	26.6	50.9
Actuated g/C Ratio	0.23	0.62	0.34	0.26	0.50
v/c Ratio	0.80	0.44	0.79	0.13	0.17
Control Delay	53.0	10.3	35.6	32.4	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	53.0	10.3	35.6	32.4	10.0
LOS	D	B	D	C	A
Approach Delay		20.7	35.6	19.8	
Approach LOS		C	D	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 26.4	Intersection LOS: C
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	288	896	826	73	100	128
Future Volume (veh/h)	288	896	826	73	100	128
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1900	1700	1900
Adj Flow Rate, veh/h	313	974	898	79	109	64
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	346	2240	1250	110	826	751
Arrive On Green	0.20	0.62	0.37	0.37	0.26	0.26
Sat Flow, veh/h	1714	3705	3453	295	3141	1615
Grp Volume(v), veh/h	313	974	483	494	109	64
Grp Sat Flow(s),veh/h/ln	1714	1805	1805	1848	1570	1615
Q Serve(g_s), s	17.8	14.0	22.8	22.8	2.6	2.2
Cycle Q Clear(g_c), s	17.8	14.0	22.8	22.8	2.6	2.2
Prop In Lane	1.00			0.16	1.00	1.00
Lane Grp Cap(c), veh/h	346	2240	672	688	826	751
V/C Ratio(X)	0.90	0.43	0.72	0.72	0.13	0.09
Avail Cap(c_a), veh/h	643	2978	728	746	826	751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.8	9.8	26.8	26.8	28.0	14.8
Incr Delay (d2), s/veh	3.6	0.2	3.5	3.5	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	7.0	12.1	12.3	1.2	2.8
LnGrp Delay(d),s/veh	42.4	10.0	30.3	30.3	28.4	15.1
LnGrp LOS	D	B	C	C	C	B
Approach Vol, veh/h		1287	977		173	
Approach Delay, s/veh		17.9	30.3		23.4	
Approach LOS		B	C		C	

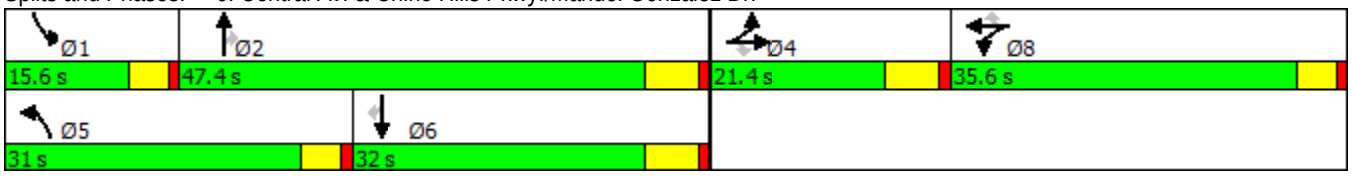
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		67.6		32.0	24.7	42.9		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		82.2		26.2	37.4	40.2		
Max Q Clear Time (g_c+I1), s		16.0		4.6	19.8	24.8		
Green Ext Time (p_c), s		32.8		0.5	0.4	12.3		

Intersection Summary	
HCM 2010 Ctrl Delay	23.3
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	439	60	382	2	4	8	481	1081	51	74	900	288
Future Volume (vph)	439	60	382	2	4	8	481	1081	51	74	900	288
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	21.4	21.4	21.4	35.6	35.6	35.6	31.0	47.4	47.4	15.6	32.0	32.0
Total Split (%)	17.8%	17.8%	17.8%	29.7%	29.7%	29.7%	25.8%	39.5%	39.5%	13.0%	26.7%	26.7%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.9	15.9	15.9	13.5	13.5	13.5	26.9	47.5	47.5	8.3	26.7	26.7
Actuated g/C Ratio	0.17	0.17	0.17	0.14	0.14	0.14	0.28	0.50	0.50	0.09	0.28	0.28
v/c Ratio	0.98	0.94	0.67	0.01	0.01	0.02	1.07	0.65	0.06	0.53	0.96	0.55
Control Delay	91.3	81.5	10.6	35.5	35.5	0.1	96.9	23.5	0.1	57.5	55.2	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.3	81.5	10.6	35.5	35.5	0.1	96.9	23.5	0.1	57.5	55.2	19.6
LOS	F	F	B	D	D	A	F	C	A	E	E	B
Approach Delay		53.5			14.3			44.7			47.2	
Approach LOS		D			B			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 47.5	Intersection LOS: D
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	439	60	382	2	4	8	481	1081	51	74	900	288
Future Volume (veh/h)	439	60	382	2	4	8	481	1081	51	74	900	288
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	523	0	319	2	4	4	523	1175	43	80	978	258
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	586	0	276	42	47	40	496	1867	818	102	1037	458
Arrive On Green	0.17	0.00	0.17	0.02	0.02	0.02	0.29	0.52	0.52	0.06	0.29	0.29
Sat Flow, veh/h	3429	0	1615	1714	1900	1615	1714	3610	1582	1714	3610	1594
Grp Volume(v), veh/h	523	0	319	2	4	4	523	1175	43	80	978	258
Grp Sat Flow(s),veh/h/ln	1714	0	1615	1714	1900	1615	1714	1805	1582	1714	1805	1594
Q Serve(g_s), s	13.6	0.0	15.6	0.1	0.2	0.2	26.4	21.3	1.2	4.2	24.2	12.6
Cycle Q Clear(g_c), s	13.6	0.0	15.6	0.1	0.2	0.2	26.4	21.3	1.2	4.2	24.2	12.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	586	0	276	42	47	40	496	1867	818	102	1037	458
V/C Ratio(X)	0.89	0.00	1.16	0.05	0.09	0.10	1.05	0.63	0.05	0.79	0.94	0.56
Avail Cap(c_a), veh/h	586	0	276	582	646	549	496	1867	818	207	1037	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	0.0	37.8	43.5	43.5	43.5	32.4	15.8	10.9	42.3	31.8	27.7
Incr Delay (d2), s/veh	15.9	0.0	102.8	0.5	0.8	1.1	55.5	1.6	0.1	5.0	17.3	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	14.8	0.1	0.1	0.1	20.0	10.9	0.6	2.1	14.4	6.1
LnGrp Delay(d),s/veh	52.9	0.0	140.6	43.9	44.3	44.6	87.9	17.4	11.1	47.3	49.1	32.6
LnGrp LOS	D		F	D	D	D	F	B	B	D	D	C
Approach Vol, veh/h		842			10			1741			1316	
Approach Delay, s/veh		86.1			44.3			38.4			45.7	
Approach LOS		F			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	53.0		21.4	31.0	32.0		6.8
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	11.0	41.6		15.6	26.4	26.2		31.0
Max Q Clear Time (g_c+I1), s	6.2	23.3		17.6	28.4	26.2		2.2
Green Ext Time (p_c), s	0.0	16.0		0.0	0.0	0.0		0.0

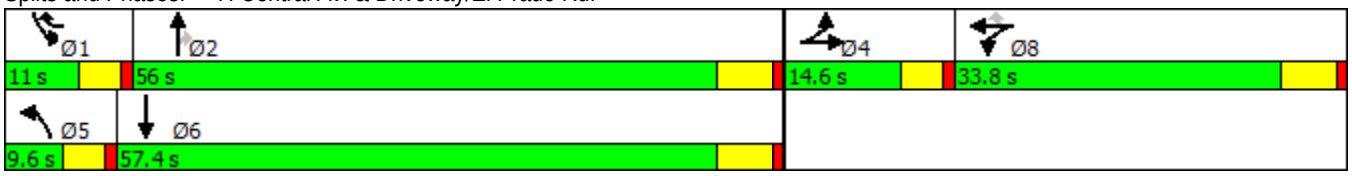
Intersection Summary	
HCM 2010 Ctrl Delay	51.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	401	4	230	2	666	480	348	794
Future Volume (vph)	1	1	401	4	230	2	666	480	348	794
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	14.6	14.6	33.8	33.8	11.0	9.6	56.0	56.0	11.0	57.4
Total Split (%)	12.7%	12.7%	29.3%	29.3%	9.5%	8.3%	48.5%	48.5%	9.5%	49.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.1	10.1	18.0	18.0	30.3	5.1	50.8	50.8	6.5	60.4
Actuated g/C Ratio	0.11	0.11	0.19	0.19	0.32	0.05	0.54	0.54	0.07	0.64
v/c Ratio	0.01	0.01	0.72	0.69	0.37	0.02	0.38	0.48	3.31	0.27
Control Delay	44.0	38.0	49.7	47.3	4.8	48.5	14.9	3.2	1074.1	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	38.0	49.7	47.3	4.8	48.5	14.9	3.2	1074.1	9.8
LOS	D	D	D	D	A	D	B	A	F	A
Approach Delay		40.0		32.6			10.0			331.3
Approach LOS		D		C			B			F

Intersection Summary	
Cycle Length: 115.4	
Actuated Cycle Length: 94.1	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 3.31	
Intersection Signal Delay: 141.0	Intersection LOS: F
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	401	4	230	2	666	480	348	794	11
Future Volume (veh/h)	1	1	1	401	4	230	2	666	480	348	794	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	1	1	1	449	0	113	2	740	364	387	882	10
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	14	7	7	567	0	377	5	1936	855	117	3182	36
Arrive On Green	0.01	0.01	0.01	0.17	0.00	0.17	0.00	0.54	0.54	0.07	0.60	0.60
Sat Flow, veh/h	1714	873	873	3429	0	1615	1714	3610	1595	1714	5288	60
Grp Volume(v), veh/h	1	0	2	449	0	113	2	740	364	387	577	315
Grp Sat Flow(s),veh/h/ln	1714	0	1746	1714	0	1615	1714	1805	1595	1714	1729	1889
Q Serve(g_s), s	0.1	0.0	0.1	11.8	0.0	5.4	0.1	11.2	12.8	6.4	7.5	7.5
Cycle Q Clear(g_c), s	0.1	0.0	0.1	11.8	0.0	5.4	0.1	11.2	12.8	6.4	7.5	7.5
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	14	0	14	567	0	377	5	1936	855	117	2081	1137
V/C Ratio(X)	0.07	0.00	0.14	0.79	0.00	0.30	0.43	0.38	0.43	3.30	0.28	0.28
Avail Cap(c_a), veh/h	183	0	186	1025	0	593	92	1936	855	117	2081	1137
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.1	0.0	46.1	37.5	0.0	29.6	46.6	12.7	13.0	43.6	8.9	8.9
Incr Delay (d2), s/veh	0.8	0.0	1.7	2.6	0.0	0.4	21.7	0.6	1.6	1057.7	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	5.8	0.0	2.5	0.1	5.7	6.0	37.4	3.6	4.0
LnGrp Delay(d),s/veh	46.9	0.0	47.8	40.1	0.0	30.0	68.3	13.2	14.6	1101.3	9.2	9.5
LnGrp LOS	D		D	D		C	E	B	B	F	A	A
Approach Vol, veh/h		3			562			1106			1279	
Approach Delay, s/veh		47.5			38.1			13.8			339.7	
Approach LOS		D			D			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	56.0		5.4	4.9	62.1		21.3
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	6.4	50.2		10.0	5.0	51.6		28.0
Max Q Clear Time (g_c+I1), s	8.4	14.8		2.1	2.1	9.5		13.8
Green Ext Time (p_c), s	0.0	22.0		0.0	0.0	24.4		1.7

Intersection Summary		
HCM 2010 Ctrl Delay		159.8
HCM 2010 LOS		F

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1365	748	101
Future Volume (vph)	1365	748	101
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	69.0	69.0	21.0
Total Split (%)	76.7%	76.7%	23.3%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	64.5	64.5	16.0
Actuated g/C Ratio	0.72	0.72	0.18
v/c Ratio	0.73	0.24	1.54dr
Control Delay	4.5	4.6	85.7
Queue Delay	0.0	0.0	0.0
Total Delay	4.5	4.6	85.7
LOS	A	A	F
Approach Delay	4.5	4.6	85.7
Approach LOS	A	A	F

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

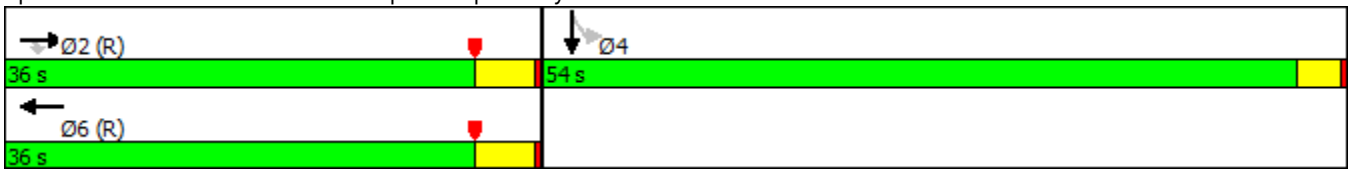
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1811	94	329	389	0
Future Volume (vph)	1811	94	329	389	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	36.0	36.0	36.0	54.0	54.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	46.0	46.0	46.0	36.0	36.0
Actuated g/C Ratio	0.51	0.51	0.51	0.40	0.40
v/c Ratio	0.86	0.14	0.41	0.68	0.85
Control Delay	26.8	6.0	7.9	26.6	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	6.0	7.9	26.6	25.1
LOS	C	A	A	C	C
Approach Delay	25.8		7.9		25.7
Approach LOS	C		A		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 82 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	✥	
Traffic Volume (veh/h)	0	1811	94	0	329	520	0	0	0	389	0	467
Future Volume (veh/h)	0	1811	94	0	329	520	0	0	0	389	0	467
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900				1800	1900	1900
Adj Flow Rate, veh/h	0	2292	0	0	416	658				471	29	450
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	3015	939	0	2010	939				565	33	505
Arrive On Green	0.00	0.58	0.00	0.00	0.19	0.19				0.33	0.33	0.33
Sat Flow, veh/h	0	5358	1615	0	3629	1615				1714	99	1531
Grp Volume(v), veh/h	0	2292	0	0	416	658				471	0	479
Grp Sat Flow(s),veh/h/ln	0	1729	1615	0	1729	1615				1714	0	1630
Q Serve(g_s), s	0.0	29.8	0.0	0.0	9.1	34.2				22.9	0.0	25.1
Cycle Q Clear(g_c), s	0.0	29.8	0.0	0.0	9.1	34.2				22.9	0.0	25.1
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.94
Lane Grp Cap(c), veh/h	0	3015	939	0	2010	939				565	0	538
V/C Ratio(X)	0.00	0.76	0.00	0.00	0.21	0.70				0.83	0.00	0.89
Avail Cap(c_a), veh/h	0	3015	939	0	2010	939				962	0	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.1	0.0	0.0	18.9	29.1				27.9	0.0	28.6
Incr Delay (d2), s/veh	0.0	1.9	0.0	0.0	0.2	4.4				1.3	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.5	0.0	0.0	4.4	16.4				10.9	0.0	11.8
LnGrp Delay(d),s/veh	0.0	16.0	0.0	0.0	19.1	33.4				29.1	0.0	31.8
LnGrp LOS		B			B	C				C		C
Approach Vol, veh/h		2292			1074						950	
Approach Delay, s/veh		16.0			27.9						30.5	
Approach LOS		B			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		56.8		33.2		56.8		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		31.5		50.5		31.5		
Max Q Clear Time (g_c+I1), s		31.8		27.1		36.2		
Green Ext Time (p_c), s		0.0		2.6		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	22.1
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	↕	
Traffic Volume (veh/h)	0	1811	94	0	329	520	0	0	0	389	0	467
Future Volume (veh/h)	0	1811	94	0	329	520	0	0	0	389	0	467
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900				1800	1900	1900
Adj Flow Rate, veh/h	0	2292	0	0	416	658				471	29	450
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79				0.79	0.79	0.79
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	3022	941	0	2015	941				563	32	503
Arrive On Green	0.00	0.58	0.00	0.00	0.97	0.97				0.33	0.33	0.33
Sat Flow, veh/h	0	5358	1615	0	3629	1615				1714	99	1531
Grp Volume(v), veh/h	0	2292	0	0	416	658				471	0	479
Grp Sat Flow(s),veh/h/ln	0	1729	1615	0	1729	1615				1714	0	1630
Q Serve(g_s), s	0.0	29.7	0.0	0.0	0.4	3.1				22.9	0.0	25.2
Cycle Q Clear(g_c), s	0.0	29.7	0.0	0.0	0.4	3.1				22.9	0.0	25.2
Prop In Lane	0.00		1.00	0.00		1.00				1.00		0.94
Lane Grp Cap(c), veh/h	0	3022	941	0	2015	941				563	0	535
V/C Ratio(X)	0.00	0.76	0.00	0.00	0.21	0.70				0.84	0.00	0.89
Avail Cap(c_a), veh/h	0	3022	941	0	2015	941				817	0	777
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.67	1.67				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.0	0.0	0.0	0.5	0.6				28.0	0.0	28.7
Incr Delay (d2), s/veh	0.0	1.8	0.0	0.0	0.2	4.3				3.4	0.0	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.5	0.0	0.0	0.2	1.7				11.4	0.0	12.4
LnGrp Delay(d),s/veh	0.0	15.9	0.0	0.0	0.7	4.9				31.4	0.0	36.0
LnGrp LOS		B			A	A				C		D
Approach Vol, veh/h		2292			1074						950	
Approach Delay, s/veh		15.9			3.3						33.7	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		56.9		33.1		56.9		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		39.1		42.9		39.1		
Max Q Clear Time (g_c+I1), s		31.7		27.2		5.1		
Green Ext Time (p_c), s		6.9		2.4		27.7		

Intersection Summary	
HCM 2010 Ctrl Delay	16.7
HCM 2010 LOS	B

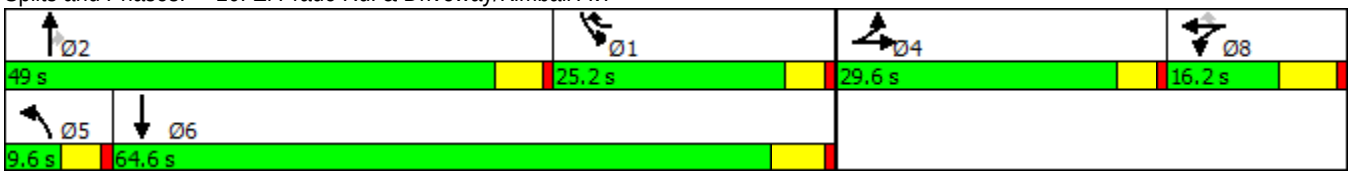
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	1	30	545	6	35	56	692	59
Future Volume (vph)	13	1	30	545	6	35	56	692	59
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	25.2	9.6	49.0	49.0	25.2	64.6
Total Split (%)	24.7%	24.7%	13.5%	21.0%	8.0%	40.8%	40.8%	21.0%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.6	12.6	10.3	36.3	5.1	10.3	10.3	21.2	25.7
Actuated g/C Ratio	0.19	0.19	0.16	0.56	0.08	0.16	0.16	0.32	0.39
v/c Ratio	0.04	0.01	0.43	0.49	0.04	0.12	0.16	1.27	0.08
Control Delay	23.4	18.3	34.0	2.5	35.0	29.7	0.9	162.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	18.3	34.0	2.5	35.0	29.7	0.9	162.1	10.7
LOS	C	B	C	A	C	C	A	F	B
Approach Delay		22.4	8.2			13.5			141.7
Approach LOS		C	A			B			F

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 65.4
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.27
Intersection Signal Delay: 76.3 — Intersection LOS: E
Intersection Capacity Utilization 70.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	2	91	30	545	6	35	56	692	59	49
Future Volume (veh/h)	13	1	2	91	30	545	6	35	56	692	59	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	13	1	1	93	31	301	6	36	57	706	60	50
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	32	32	212	71	763	132	293	249	545	796	597
Arrive On Green	0.04	0.04	0.04	0.15	0.15	0.15	0.08	0.15	0.15	0.32	0.40	0.40
Sat Flow, veh/h	1714	873	873	1373	458	1615	1714	1900	1615	1714	1967	1476
Grp Volume(v), veh/h	13	0	2	124	0	301	6	36	57	706	55	55
Grp Sat Flow(s),veh/h/ln	1714	0	1746	1831	0	1615	1714	1900	1615	1714	1805	1637
Q Serve(g_s), s	0.5	0.0	0.1	4.0	0.0	0.0	0.2	1.1	2.0	20.6	1.2	1.4
Cycle Q Clear(g_c), s	0.5	0.0	0.1	4.0	0.0	0.0	0.2	1.1	2.0	20.6	1.2	1.4
Prop In Lane	1.00		0.50	0.75		1.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	63	0	64	283	0	763	132	293	249	545	730	662
V/C Ratio(X)	0.21	0.00	0.03	0.44	0.00	0.39	0.05	0.12	0.23	1.29	0.07	0.08
Avail Cap(c_a), veh/h	662	0	674	283	0	763	132	1285	1092	545	1639	1487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	0.0	30.1	24.8	0.0	11.1	27.7	23.6	24.0	22.1	11.8	11.9
Incr Delay (d2), s/veh	1.6	0.0	0.2	1.1	0.0	0.3	0.1	0.2	0.5	145.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	2.1	0.0	3.5	0.1	0.6	0.9	31.6	0.6	0.6
LnGrp Delay(d),s/veh	31.9	0.0	30.3	25.9	0.0	11.4	27.7	23.8	24.5	167.9	11.9	11.9
LnGrp LOS	C		C	C		B	C	C	C	F	B	B
Approach Vol, veh/h		15			425			99			816	
Approach Delay, s/veh		31.7			15.6			24.4			146.9	
Approach LOS		C			B			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.4	15.2		7.0	9.6	32.0		16.2
Change Period (Y+Rc), s	5.8	* 5.2		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	20.6	* 44		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	22.6	4.0		2.5	2.2	3.4		6.0
Green Ext Time (p_c), s	0.0	0.3		0.0	0.0	1.6		0.6

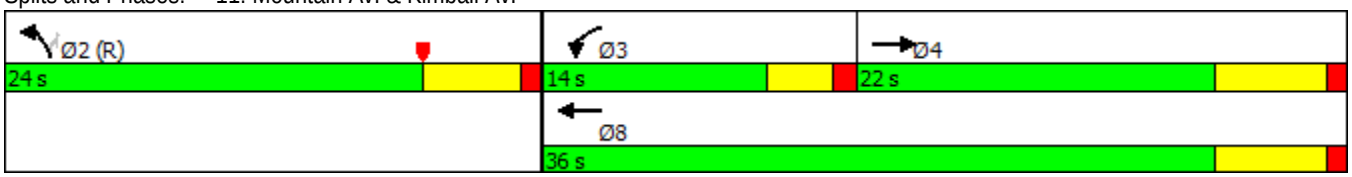
Intersection Summary	
HCM 2010 Ctrl Delay	95.5
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	710	101	626	39	72
Future Volume (vph)	710	101	626	39	72
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	22.0	14.0	36.0	24.0	24.0
Total Split (%)	36.7%	23.3%	60.0%	40.0%	40.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	16.1	8.3	26.2	22.5	22.5
Actuated g/C Ratio	0.27	0.14	0.44	0.38	0.38
v/c Ratio	0.82	0.45	0.41	0.06	0.11
Control Delay	28.7	24.7	22.8	15.5	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	24.7	22.8	15.5	5.3
LOS	C	C	C	B	A
Approach Delay	28.7		23.1	8.9	
Approach LOS	C		C	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 18.7 (31%), Referenced to phase 2:NBL and 6:, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 24.8	Intersection LOS: C
Intersection Capacity Utilization 45.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	710	50	101	626	39	72
Future Volume (veh/h)	710	50	101	626	39	72
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	740	47	105	652	41	70
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	871	55	165	1501	679	639
Arrive On Green	0.25	0.25	0.03	0.14	0.40	0.40
Sat Flow, veh/h	3542	219	1714	3705	1714	1615
Grp Volume(v), veh/h	387	400	105	652	41	70
Grp Sat Flow(s),veh/h/ln	1805	1861	1714	1805	1714	1615
Q Serve(g_s), s	12.2	12.3	3.6	9.9	0.9	1.6
Cycle Q Clear(g_c), s	12.2	12.3	3.6	9.9	0.9	1.6
Prop In Lane		0.12	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	456	470	165	1501	679	639
V/C Ratio(X)	0.85	0.85	0.64	0.43	0.06	0.11
Avail Cap(c_a), veh/h	481	496	286	1805	679	639
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	21.3	21.3	28.0	19.4	11.2	11.4
Incr Delay (d2), s/veh	1.3	1.2	1.2	0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	6.4	1.8	5.0	0.5	0.8
LnGrp Delay(d),s/veh	22.6	22.6	29.2	19.5	11.4	11.8
LnGrp LOS	C	C	C	B	B	B
Approach Vol, veh/h	787			757	111	
Approach Delay, s/veh	22.6			20.8	11.6	
Approach LOS	C			C	B	

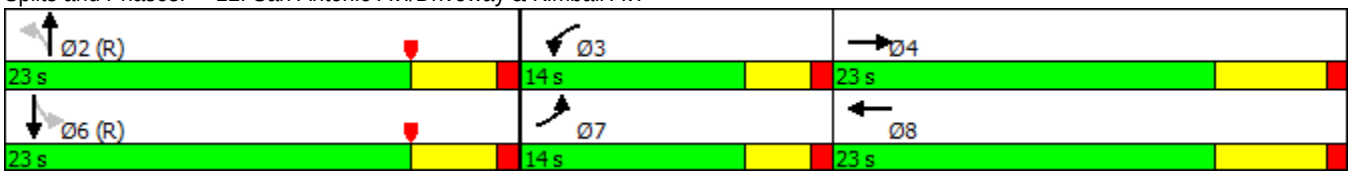
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		29.1	9.8	21.2				30.9
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		18.7	10.0	16.0				30.0
Max Q Clear Time (g_c+I1), s		3.6	5.6	14.3				11.9
Green Ext Time (p_c), s		0.1	0.0	0.9				3.8

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	681	25	716	24	0		
Future Volume (vph)	681	25	716	24	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	23.0	14.0	23.0	23.0	23.0	23.0	14.0
Total Split (%)	38.3%	23.3%	38.3%	38.3%	38.3%	38%	23%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	16.8	7.0	21.2	27.9	27.9		
Actuated g/C Ratio	0.28	0.12	0.35	0.46	0.46		
v/c Ratio	0.79	0.14	0.60	0.04	0.01		
Control Delay	25.3	25.6	17.1	13.6	0.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	25.3	25.6	17.1	13.6	0.0		
LOS	C	C	B	B	A		
Approach Delay	25.3		17.4		10.7		
Approach LOS	C		B		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 18.1 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 21.1	Intersection LOS: C
Intersection Capacity Utilization 36.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	681	65	25	716	0	24	0	7	0	0	0
Future Volume (veh/h)	0	681	65	25	716	0	24	0	7	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	724	69	27	762	0	26	0	4	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	841	80	72	1306	0	902	0	737	120	867	0
Arrive On Green	0.00	0.25	0.25	0.04	0.36	0.00	0.46	0.00	0.46	0.00	0.00	0.00
Sat Flow, veh/h	1714	3324	317	1714	3705	0	1714	0	1615	1435	1900	0
Grp Volume(v), veh/h	0	393	400	27	762	0	26	0	4	0	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1836	1714	1805	0	1714	0	1615	1435	1900	0
Q Serve(g_s), s	0.0	12.5	12.5	0.9	10.2	0.0	0.5	0.0	0.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	12.5	12.5	0.9	10.2	0.0	0.5	0.0	0.1	0.0	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	3	457	464	72	1306	0	902	0	737	120	867	0
V/C Ratio(X)	0.00	0.86	0.86	0.37	0.58	0.00	0.03	0.00	0.01	0.00	0.00	0.00
Avail Cap(c_a), veh/h	286	511	520	286	1306	0	902	0	737	120	867	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.72	0.72	0.81	0.81	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	21.4	21.4	28.0	15.5	0.0	9.0	0.0	8.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	8.8	8.7	0.9	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	7.5	0.5	5.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	30.2	30.1	28.9	15.8	0.0	9.1	0.0	8.9	0.0	0.0	0.0
LnGrp LOS		C	C	C	B		A		A			
Approach Vol, veh/h		793			789			30			0	
Approach Delay, s/veh		30.2			16.3			9.0			0.0	
Approach LOS		C			B			A				

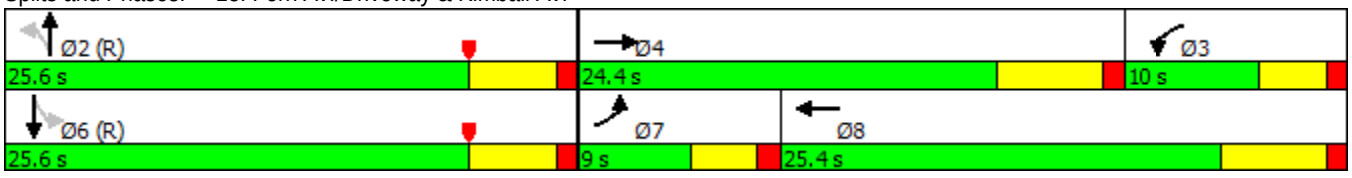
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		32.3	6.5	21.2		32.3	0.0	27.7
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		18.1	10.0	17.0		18.1	10.0	17.0
Max Q Clear Time (g_c+I1), s		2.5	2.9	14.5		0.0	0.0	12.2
Green Ext Time (p_c), s		0.0	0.0	0.7		0.0	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	580	40	686	47	0	66	1
Future Volume (vph)	38	580	40	686	47	0	66	1
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	24.4	10.0	25.4	25.6	25.6	25.6	25.6
Total Split (%)	15.0%	40.7%	16.7%	42.3%	42.7%	42.7%	42.7%	42.7%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	5.5	16.2	5.9	16.7	28.7	28.7	28.7	28.7
Actuated g/C Ratio	0.09	0.27	0.10	0.28	0.48	0.48	0.48	0.48
v/c Ratio	0.27	0.74	0.26	0.78	0.08	0.03	0.11	0.01
Control Delay	23.6	9.9	30.6	24.2	12.6	0.1	12.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	9.9	30.6	24.2	12.6	0.1	12.8	8.6
LOS	C	A	C	C	B	A	B	A
Approach Delay		10.7		24.5		8.0		12.3
Approach LOS		B		C		A		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 51 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 46.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	580	70	40	686	20	47	0	27	66	1	8
Future Volume (veh/h)	38	580	70	40	686	20	47	0	27	66	1	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	42	644	71	44	762	22	52	0	20	73	1	8
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	72	747	82	74	925	27	768	0	737	756	83	667
Arrive On Green	0.08	0.46	0.46	0.04	0.26	0.26	0.46	0.00	0.46	0.46	0.46	0.46
Sat Flow, veh/h	1714	3272	360	1714	3583	103	1428	0	1615	1414	182	1460
Grp Volume(v), veh/h	42	355	360	44	384	400	52	0	20	73	0	9
Grp Sat Flow(s),veh/h/ln	1714	1805	1827	1714	1805	1882	1428	0	1615	1414	0	1642
Q Serve(g_s), s	1.4	10.6	10.6	1.5	12.0	12.0	1.2	0.0	0.4	1.8	0.0	0.2
Cycle Q Clear(g_c), s	1.4	10.6	10.6	1.5	12.0	12.0	1.4	0.0	0.4	2.2	0.0	0.2
Prop In Lane	1.00		0.20	1.00		0.05	1.00		1.00	1.00		0.89
Lane Grp Cap(c), veh/h	72	412	417	74	466	486	768	0	737	756	0	750
V/C Ratio(X)	0.58	0.86	0.86	0.59	0.82	0.82	0.07	0.00	0.03	0.10	0.00	0.01
Avail Cap(c_a), veh/h	143	563	569	171	593	618	768	0	737	756	0	750
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.52	0.52	0.52	0.57	0.57	0.57	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.0	15.4	15.4	28.2	21.0	21.0	9.3	0.0	9.0	9.6	0.0	8.9
Incr Delay (d2), s/veh	1.5	4.2	4.3	1.6	3.5	3.3	0.2	0.0	0.1	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.6	5.7	0.7	6.4	6.7	0.5	0.0	0.2	0.7	0.0	0.1
LnGrp Delay(d),s/veh	28.4	19.7	19.8	29.8	24.4	24.3	9.5	0.0	9.0	9.8	0.0	8.9
LnGrp LOS	C	B	B	C	C	C	A		A	A		A
Approach Vol, veh/h		757			828			72			82	
Approach Delay, s/veh		20.2			24.7			9.3			9.7	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		32.3	8.3	19.4		32.3	6.5	21.2
Change Period (Y+Rc), s		4.9	5.7	* 5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		20.7	6.0	* 19		20.7	5.0	19.7
Max Q Clear Time (g_c+I1), s		3.4	3.5	12.6		4.2	3.4	14.0
Green Ext Time (p_c), s		0.1	0.6	1.1		0.1	0.0	1.2

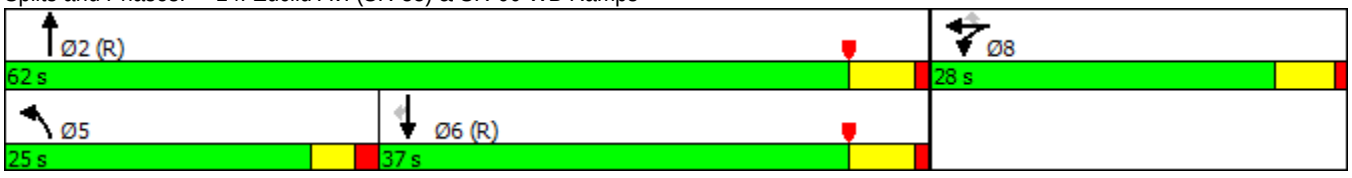
Intersection Summary	
HCM 2010 Ctrl Delay	21.4
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	702	2	401	545	1472	1445	796
Future Volume (vph)	702	2	401	545	1472	1445	796
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	28.0	28.0	28.0	25.0	62.0	37.0	37.0
Total Split (%)	31.1%	31.1%	31.1%	27.8%	68.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	23.0	23.0	23.0	20.5	56.5	31.5	31.5
Actuated g/C Ratio	0.26	0.26	0.26	0.23	0.63	0.35	0.35
v/c Ratio	1.00	0.97	0.80	1.51	0.70	1.23	0.93
Control Delay	79.8	70.7	39.2	253.4	27.7	139.3	27.5
Queue Delay	0.0	0.0	0.0	0.0	48.9	0.4	0.0
Total Delay	79.8	70.7	39.2	253.4	76.6	139.6	27.5
LOS	E	E	D	F	E	F	C
Approach Delay		64.2			124.3	99.8	
Approach LOS		E			F	F	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.51	
Intersection Signal Delay: 101.7	Intersection LOS: F
Intersection Capacity Utilization 118.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	702	2	401	545	1472	0	0	1445	796
Future Volume (veh/h)	0	0	0	702	2	401	545	1472	0	0	1445	796
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.96
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1800	1900	1900	1800	1900	0	0	1900	1900
Adj Flow Rate, veh/h				842	0	185	586	1583	0	0	1554	856
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				876	0	413	390	2266	0	0	1264	544
Arrive On Green				0.26	0.00	0.26	0.46	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3429	0	1615	1714	3705	0	0	3705	1554
Grp Volume(v), veh/h				842	0	185	586	1583	0	0	1554	856
Grp Sat Flow(s),veh/h/ln				1714	0	1615	1714	1805	0	0	1805	1554
Q Serve(g_s), s				21.8	0.0	8.7	20.5	0.0	0.0	0.0	31.5	31.5
Cycle Q Clear(g_c), s				21.8	0.0	8.7	20.5	0.0	0.0	0.0	31.5	31.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				876	0	413	390	2266	0	0	1264	544
V/C Ratio(X)				0.96	0.00	0.45	1.50	0.70	0.00	0.00	1.23	1.57
Avail Cap(c_a), veh/h				876	0	413	390	2266	0	0	1264	544
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				33.1	0.0	28.2	24.5	0.0	0.0	0.0	29.3	29.3
Incr Delay (d2), s/veh				21.2	0.0	0.3	226.6	0.2	0.0	0.0	110.6	266.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.9	0.0	3.9	34.1	0.1	0.0	0.0	35.0	53.8
LnGrp Delay(d),s/veh				54.3	0.0	28.4	251.1	0.2	0.0	0.0	139.8	296.0
LnGrp LOS				D		C	F	A			F	F
Approach Vol, veh/h					1027			2169			2410	
Approach Delay, s/veh					49.6			68.0			195.3	
Approach LOS					D			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.0			25.0	37.0		28.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		56.5			20.5	31.5		23.0
Max Q Clear Time (g_c+I1), s		2.0			22.5	33.5		23.8
Green Ext Time (p_c), s		52.9			0.0	0.0		0.0

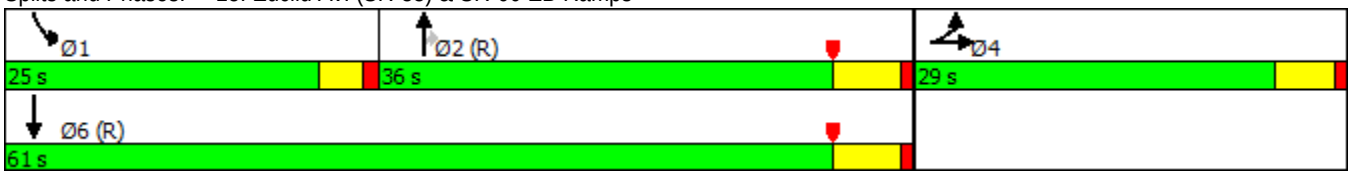
Intersection Summary	
HCM 2010 Ctrl Delay	119.4
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	423	0	1594	784	313	1835
Future Volume (vph)	423	0	1594	784	313	1835
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	29.0	29.0	36.0	36.0	25.0	61.0
Total Split (%)	32.2%	32.2%	40.0%	40.0%	27.8%	67.8%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	24.0	24.0	31.9	31.9	19.6	55.5
Actuated g/C Ratio	0.27	0.27	0.35	0.35	0.22	0.62
v/c Ratio	0.94	1.15	1.33	0.87	0.89	0.88
Control Delay	63.9	117.4	180.6	19.0	43.1	6.4
Queue Delay	133.8	33.4	0.4	0.0	0.0	45.0
Total Delay	197.8	150.8	181.0	19.0	43.1	51.4
LOS	F	F	F	B	D	D
Approach Delay		170.9	127.6			50.2
Approach LOS		F	F			D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 104.0	Intersection LOS: F
Intersection Capacity Utilization 118.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	423	0	466	0	0	0	0	1594	784	313	1835	0
Future Volume (veh/h)	423	0	466	0	0	0	0	1594	784	313	1835	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900				0	1900	1900	1800	1900	0
Adj Flow Rate, veh/h	432	26	413				0	1696	834	333	1952	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	457	26	409				0	1301	579	363	2226	0
Arrive On Green	0.27	0.27	0.27				0.00	0.36	0.36	0.28	0.82	0.00
Sat Flow, veh/h	1714	97	1533				0	3705	1606	1714	3705	0
Grp Volume(v), veh/h	432	0	439				0	1696	834	333	1952	0
Grp Sat Flow(s),veh/h/ln	1714	0	1629				0	1805	1606	1714	1805	0
Q Serve(g_s), s	22.2	0.0	24.0				0.0	32.4	32.4	16.9	31.2	0.0
Cycle Q Clear(g_c), s	22.2	0.0	24.0				0.0	32.4	32.4	16.9	31.2	0.0
Prop In Lane	1.00		0.94				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	457	0	435				0	1301	579	363	2226	0
V/C Ratio(X)	0.94	0.00	1.01				0.00	1.30	1.44	0.92	0.88	0.00
Avail Cap(c_a), veh/h	457	0	435				0	1301	579	400	2226	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.09	0.09	0.09	0.09	0.00
Uniform Delay (d), s/veh	32.4	0.0	33.0				0.0	28.8	28.8	31.6	5.9	0.0
Incr Delay (d2), s/veh	28.3	0.0	45.8				0.0	137.0	199.1	3.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	0.0	16.3				0.0	40.8	46.3	8.3	14.8	0.0
LnGrp Delay(d),s/veh	60.7	0.0	78.8				0.0	165.8	227.9	34.7	6.4	0.0
LnGrp LOS	E		F					F	F	C	A	
Approach Vol, veh/h		871						2530			2285	
Approach Delay, s/veh		69.8						186.2			10.5	
Approach LOS		E						F			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.1	37.9		29.0		61.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	21.0	30.5		24.0		55.5		
Max Q Clear Time (g_c+I1), s	18.9	34.4		26.0		33.2		
Green Ext Time (p_c), s	0.1	0.0		0.0		22.2		

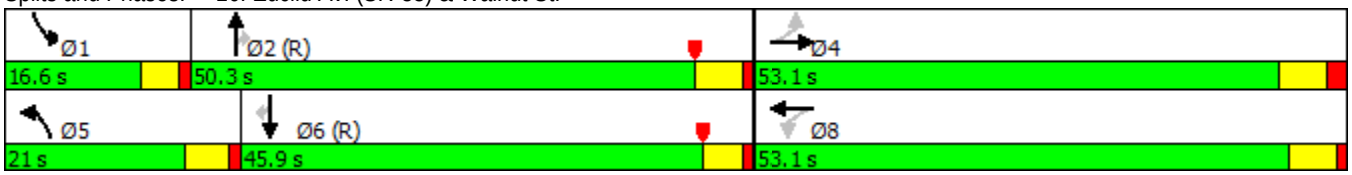
Intersection Summary	
HCM 2010 Ctrl Delay	97.8
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	297	442	124	409	148	1851	71	209	1881	76
Future Volume (vph)	297	442	124	409	148	1851	71	209	1881	76
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	53.1	53.1	53.1	53.1	21.0	50.3	50.3	16.6	45.9	45.9
Total Split (%)	44.3%	44.3%	44.3%	44.3%	17.5%	41.9%	41.9%	13.8%	38.3%	38.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	46.8	46.8	47.8	47.8	14.5	46.0	46.0	11.1	43.0	43.0
Actuated g/C Ratio	0.39	0.39	0.40	0.40	0.12	0.38	0.38	0.09	0.36	0.36
v/c Ratio	1.53	0.48	0.59	0.47	0.75	0.98	0.11	0.72	1.07	0.13
Control Delay	289.5	26.0	41.6	23.5	35.2	37.1	9.5	66.2	78.6	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	289.5	26.0	41.6	23.5	35.2	37.1	9.5	66.2	78.6	8.2
LOS	F	C	D	C	D	D	A	E	E	A
Approach Delay		111.1		26.5		36.0			74.9	
Approach LOS		F		C		D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.53	
Intersection Signal Delay: 60.7	Intersection LOS: E
Intersection Capacity Utilization 99.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	442	182	124	409	228	148	1851	71	209	1881	76
Future Volume (veh/h)	297	442	182	124	409	228	148	1851	71	209	1881	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	313	465	170	131	431	207	156	1948	56	220	1980	51
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	262	1012	367	266	921	438	184	2041	635	274	1893	589
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.04	0.13	0.13	0.08	0.37	0.37
Sat Flow, veh/h	802	2596	942	805	2362	1123	1714	5187	1615	3326	5187	1612
Grp Volume(v), veh/h	313	322	313	131	328	310	156	1948	56	220	1980	51
Grp Sat Flow(s),veh/h/ln	802	1805	1733	805	1805	1680	1714	1729	1615	1663	1729	1612
Q Serve(g_s), s	30.3	15.9	16.1	17.4	16.3	16.5	10.9	44.8	3.7	7.8	43.8	2.5
Cycle Q Clear(g_c), s	46.8	15.9	16.1	33.5	16.3	16.5	10.9	44.8	3.7	7.8	43.8	2.5
Prop In Lane	1.00		0.54	1.00		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	704	676	266	704	655	184	2041	635	274	1893	589
V/C Ratio(X)	1.19	0.46	0.46	0.49	0.47	0.47	0.85	0.95	0.09	0.80	1.05	0.09
Avail Cap(c_a), veh/h	262	704	676	273	719	669	230	2041	635	335	1893	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.36	0.36	0.36
Uniform Delay (d), s/veh	48.3	27.2	27.2	39.7	27.3	27.4	56.9	51.1	33.3	54.1	38.1	25.0
Incr Delay (d2), s/veh	118.2	0.5	0.5	1.4	0.5	0.5	2.3	1.5	0.0	3.4	26.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.3	8.0	7.8	4.0	8.2	7.8	5.3	21.8	1.6	3.7	25.5	1.1
LnGrp Delay(d),s/veh	166.5	27.6	27.7	41.1	27.8	27.9	59.2	52.7	33.3	57.5	64.7	25.1
LnGrp LOS	F	C	C	D	C	C	E	D	C	E	F	C
Approach Vol, veh/h		948			769			2160			2251	
Approach Delay, s/veh		73.5			30.1			52.7			63.1	
Approach LOS		E			C			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.4	52.5		53.1	17.8	49.1		53.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	12.1	45.0		46.8	16.1	* 41		* 48
Max Q Clear Time (g_c+I1), s	9.8	46.8		48.8	12.9	45.8		35.5
Green Ext Time (p_c), s	0.1	0.0		0.0	0.1	0.0		7.8

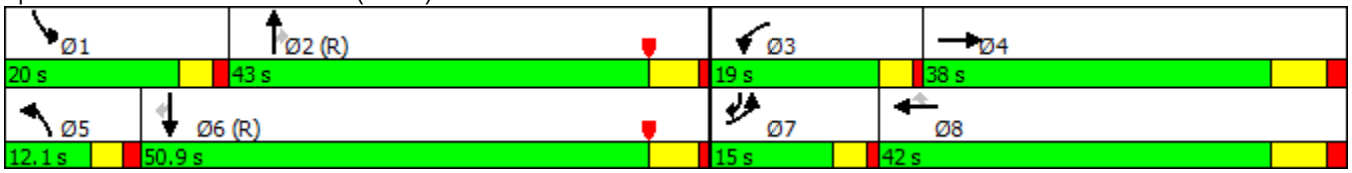
Intersection Summary			
HCM 2010 Ctrl Delay		56.9	
HCM 2010 LOS		E	

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	189	501	279	507	67	153	1606	338	238	1940	196
Future Volume (vph)	189	501	279	507	67	153	1606	338	238	1940	196
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	15.0	38.0	19.0	42.0	42.0	12.1	43.0	43.0	20.0	50.9	15.0
Total Split (%)	12.5%	31.7%	15.8%	35.0%	35.0%	10.1%	35.8%	35.8%	16.7%	42.4%	12.5%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.0	29.3	15.0	33.3	33.3	9.3	37.5	37.5	17.2	45.4	61.9
Actuated g/C Ratio	0.09	0.24	0.12	0.28	0.28	0.08	0.31	0.31	0.14	0.38	0.52
v/c Ratio	1.28	0.84	1.38	0.53	0.13	1.22	1.50	0.56	1.03	1.50	0.24
Control Delay	208.1	49.7	237.2	38.7	0.5	161.7	251.1	7.6	116.6	244.3	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	208.1	49.7	237.2	38.7	0.5	161.7	251.1	7.6	116.6	244.3	0.7
LOS	F	D	F	D	A	F	F	A	F	F	A
Approach Delay		83.5		100.6			205.3			211.4	
Approach LOS		F		F			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 39 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.50	
Intersection Signal Delay: 175.9	Intersection LOS: F
Intersection Capacity Utilization 116.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	501	196	279	507	67	153	1606	338	238	1940	196
Future Volume (veh/h)	189	501	196	279	507	67	153	1606	338	238	1940	196
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	199	527	183	294	534	66	161	1691	275	251	2042	140
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	157	639	221	214	1000	447	109	1181	528	221	1419	783
Arrive On Green	0.09	0.24	0.24	0.13	0.28	0.28	0.08	0.44	0.44	0.17	0.52	0.52
Sat Flow, veh/h	1714	2623	907	1714	3610	1613	1714	3610	1615	1714	3610	1615
Grp Volume(v), veh/h	199	362	348	294	534	66	161	1691	275	251	2042	140
Grp Sat Flow(s),veh/h/ln	1714	1805	1725	1714	1805	1613	1714	1805	1615	1714	1805	1615
Q Serve(g_s), s	11.0	22.8	23.0	15.0	15.1	3.7	7.6	39.3	14.9	15.5	47.2	4.8
Cycle Q Clear(g_c), s	11.0	22.8	23.0	15.0	15.1	3.7	7.6	39.3	14.9	15.5	47.2	4.8
Prop In Lane	1.00		0.53	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	440	420	214	1000	447	109	1181	528	221	1419	783
V/C Ratio(X)	1.27	0.82	0.83	1.37	0.53	0.15	1.48	1.43	0.52	1.13	1.44	0.18
Avail Cap(c_a), veh/h	157	466	446	214	1053	471	109	1181	528	221	1419	783
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.5	42.9	43.0	52.5	36.8	32.7	54.9	33.9	27.0	49.7	28.6	13.5
Incr Delay (d2), s/veh	160.5	11.5	12.4	194.1	0.7	0.2	221.8	194.7	0.3	65.8	198.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	12.8	12.4	18.6	7.6	1.7	10.3	51.4	6.6	11.3	62.4	2.1
LnGrp Delay(d),s/veh	215.0	54.4	55.4	246.6	37.5	32.9	276.7	228.6	27.3	115.5	226.7	13.5
LnGrp LOS	F	D	E	F	D	C	F	F	C	F	F	B
Approach Vol, veh/h		909			894			2127			2433	
Approach Delay, s/veh		90.0			105.9			206.2			203.0	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	44.8	19.0	36.2	12.1	52.7	15.0	40.2
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	37.5	15.0	31.0	7.6	45.4	11.0	35.0
Max Q Clear Time (g_c+I1), s	17.5	41.3	17.0	25.0	9.6	49.2	13.0	17.1
Green Ext Time (p_c), s	0.0	0.0	0.0	4.3	0.0	0.0	0.0	9.8

Intersection Summary	
HCM 2010 Ctrl Delay	174.3
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	212	233	93	152	211	89	1800	209	58	2265	128
Future Volume (vph)	212	233	93	152	211	89	1800	209	58	2265	128
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	16.0	65.0	65.0	11.0	60.0	60.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	13.3%	54.2%	54.2%	9.2%	50.0%	50.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	37.0	37.0	37.0		37.0	10.2	61.2	61.2	7.0	56.3	56.3
Actuated g/C Ratio	0.31	0.31	0.31		0.31	0.08	0.51	0.51	0.06	0.47	0.47
v/c Ratio	1.02	0.42	0.18		1.28	0.65	1.03	0.26	0.62	1.41	0.17
Control Delay	109.0	35.7	6.7		177.6	71.3	52.9	5.8	41.0	223.1	20.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.0	35.7	6.7		177.6	71.3	52.9	5.8	41.0	223.1	20.3
LOS	F	D	A		F	E	D	A	D	F	C
Approach Delay		59.5			177.6		48.9			208.2	
Approach LOS		E			F		D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.41	
Intersection Signal Delay: 131.1	Intersection LOS: F
Intersection Capacity Utilization 126.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	233	93	152	211	107	89	1800	209	58	2265	128
Future Volume (veh/h)	212	233	93	152	211	107	89	1800	209	58	2265	128
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	223	245	74	160	222	109	94	1895	184	61	2384	106
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	244	586	492	141	154	73	115	1838	822	77	1758	786
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.13	1.00	1.00	0.05	0.49	0.49
Sat Flow, veh/h	1066	1900	1594	329	500	237	1714	3610	1615	1714	3610	1613
Grp Volume(v), veh/h	223	245	74	491	0	0	94	1895	184	61	2384	106
Grp Sat Flow(s),veh/h/ln	1066	1900	1594	1066	0	0	1714	1805	1615	1714	1805	1613
Q Serve(g_s), s	0.0	12.3	4.0	24.7	0.0	0.0	6.4	61.1	0.0	4.2	58.4	4.3
Cycle Q Clear(g_c), s	37.0	12.3	4.0	37.0	0.0	0.0	6.4	61.1	0.0	4.2	58.4	4.3
Prop In Lane	1.00		1.00	0.33		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	586	492	368	0	0	115	1838	822	77	1758	786
V/C Ratio(X)	0.91	0.42	0.15	1.33	0.00	0.00	0.82	1.03	0.22	0.79	1.36	0.13
Avail Cap(c_a), veh/h	244	586	492	368	0	0	179	1838	822	107	1758	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.38	0.38	0.38	0.09	0.09	0.09
Uniform Delay (d), s/veh	44.7	33.0	30.1	47.8	0.0	0.0	51.2	0.0	0.0	56.7	30.8	16.9
Incr Delay (d2), s/veh	35.4	0.5	0.1	167.3	0.0	0.0	3.3	22.0	0.2	1.6	160.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	6.5	1.8	29.3	0.0	0.0	3.1	5.6	0.1	2.0	68.3	1.9
LnGrp Delay(d),s/veh	80.1	33.4	30.2	215.2	0.0	0.0	54.5	22.0	0.2	58.3	191.4	16.9
LnGrp LOS	F	C	C	F			D	F	A	E	F	B
Approach Vol, veh/h		542			491			2173			2551	
Approach Delay, s/veh		52.2			215.2			21.6			180.9	
Approach LOS		D			F			C			F	

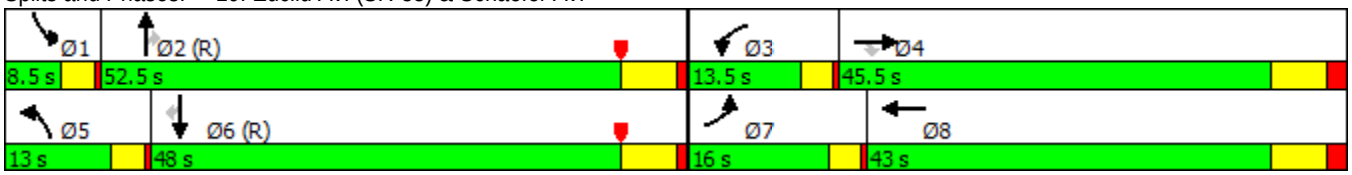
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.9	67.1		44.0	11.6	64.4		44.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.5	59.0		37.0	12.5	54.0		37.0
Max Q Clear Time (g_c+I1), s	6.2	63.1		39.0	8.4	60.4		39.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		111.6
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	181	79	159	77	155	150	1442	27	40	2400	227
Future Volume (vph)	181	79	159	77	155	150	1442	27	40	2400	227
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	16.0	45.5	45.5	13.5	43.0	13.0	52.5	52.5	8.5	48.0	48.0
Total Split (%)	13.3%	37.9%	37.9%	11.3%	35.8%	10.8%	43.8%	43.8%	7.1%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.5	26.8	26.8	10.0	21.6	18.3	61.0	61.0	6.6	47.6	47.6
Actuated g/C Ratio	0.10	0.22	0.22	0.08	0.18	0.15	0.51	0.51	0.06	0.40	0.40
v/c Ratio	1.08	0.20	0.35	0.58	0.71	0.62	0.84	0.03	0.46	1.78	0.34
Control Delay	142.0	38.0	7.3	69.7	52.5	46.1	28.0	0.1	60.1	377.6	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.0	38.0	7.3	69.7	52.5	46.1	28.0	0.1	60.1	377.6	11.4
LOS	F	D	A	E	D	D	C	A	E	F	B
Approach Delay		71.4			56.9		29.2			341.7	
Approach LOS		E			E		C			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.78	
Intersection Signal Delay: 200.8	Intersection LOS: F
Intersection Capacity Utilization 115.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	79	159	77	155	72	150	1442	27	40	2400	227
Future Volume (veh/h)	181	79	159	77	155	72	150	1442	27	40	2400	227
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	193	84	117	82	165	75	160	1534	24	43	2553	193
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	352	299	134	197	89	136	1944	870	54	1773	774
Arrive On Green	0.10	0.19	0.19	0.08	0.16	0.16	0.03	0.18	0.18	0.02	0.33	0.33
Sat Flow, veh/h	1714	1900	1615	1714	1238	563	1714	3610	1615	1714	3610	1577
Grp Volume(v), veh/h	193	84	117	82	0	240	160	1534	24	43	2553	193
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	0	1801	1714	1805	1615	1714	1805	1577
Q Serve(g_s), s	12.5	4.5	7.6	5.6	0.0	15.5	9.5	48.8	1.5	3.0	58.9	10.7
Cycle Q Clear(g_c), s	12.5	4.5	7.6	5.6	0.0	15.5	9.5	48.8	1.5	3.0	58.9	10.7
Prop In Lane	1.00		1.00	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	352	299	134	0	286	136	1944	870	54	1773	774
V/C Ratio(X)	1.08	0.24	0.39	0.61	0.00	0.84	1.18	0.79	0.03	0.79	1.44	0.25
Avail Cap(c_a), veh/h	179	610	518	143	0	540	136	1944	870	71	1773	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.8	41.7	43.0	53.6	0.0	49.0	58.4	42.8	23.4	58.3	40.3	24.1
Incr Delay (d2), s/veh	90.5	0.3	0.6	4.5	0.0	4.9	87.7	0.3	0.0	2.9	198.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	2.4	3.5	2.8	0.0	8.1	7.8	24.5	0.7	1.5	78.2	4.7
LnGrp Delay(d),s/veh	144.3	41.9	43.6	58.1	0.0	53.9	146.2	43.1	23.4	61.2	238.4	24.2
LnGrp LOS	F	D	D	E		D	F	D	C	E	F	C
Approach Vol, veh/h		394			322			1718			2789	
Approach Delay, s/veh		92.6			55.0			52.4			220.9	
Approach LOS		F			D			D			F	

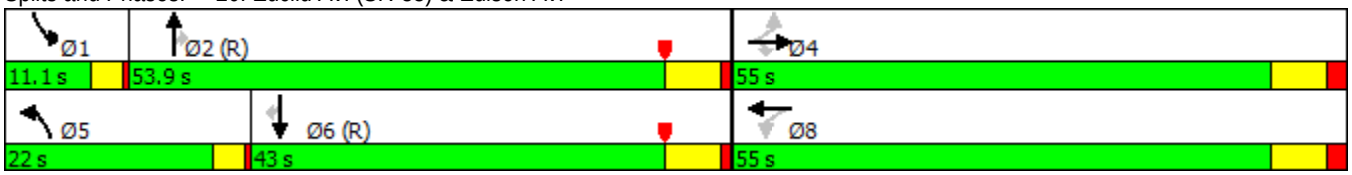
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	70.6	12.8	29.2	13.0	64.9	16.0	26.1
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	46.5	10.0	38.5	9.5	42.0	12.5	36.0
Max Q Clear Time (g_c+I1), s	5.0	50.8	7.6	9.6	11.5	60.9	14.5	17.5
Green Ext Time (p_c), s	0.0	0.0	0.0	1.7	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	145.6
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	401	579	300	273	655	309	1191	81	363	2098	322
Future Volume (vph)	401	579	300	273	655	309	1191	81	363	2098	322
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	55.0	55.0	55.0	55.0	55.0	22.0	53.9	53.9	11.1	43.0	43.0
Total Split (%)	45.8%	45.8%	45.8%	45.8%	45.8%	18.3%	44.9%	44.9%	9.3%	35.8%	35.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	48.0	48.0	48.0	48.0	48.0	18.5	47.9	47.9	7.6	37.0	37.0
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.15	0.40	0.40	0.06	0.31	0.31
v/c Ratio	7.24	0.81	0.39	2.57	1.48	1.25	0.88	0.13	3.57	2.01	0.62
Control Delay	2849.6	41.9	5.5	749.8	254.4	176.8	45.7	10.2	1179.0	470.9	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2849.6	41.9	5.5	749.8	254.4	176.8	45.7	10.2	1179.0	470.9	2.2
LOS	F	D	A	F	F	F	D	B	F	F	A
Approach Delay		913.6			358.7		69.5			508.9	
Approach LOS		F			F		E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 7.24	
Intersection Signal Delay: 455.4	Intersection LOS: F
Intersection Capacity Utilization 176.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	579	300	273	655	367	309	1191	81	363	2098	322
Future Volume (veh/h)	401	579	300	273	655	367	309	1191	81	363	2098	322
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	427	616	252	290	697	388	329	1267	71	386	2232	312
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	60	760	646	133	459	256	264	1441	645	109	1113	497
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.31	0.80	0.80	0.06	0.31	0.31
Sat Flow, veh/h	528	1900	1615	648	1148	639	1714	3610	1615	1714	3610	1612
Grp Volume(v), veh/h	427	616	252	290	0	1085	329	1267	71	386	2232	312
Grp Sat Flow(s),veh/h/ln	528	1900	1615	648	0	1787	1714	1805	1615	1714	1805	1612
Q Serve(g_s), s	0.0	34.5	13.3	13.5	0.0	48.0	18.5	28.5	1.2	7.6	37.0	19.9
Cycle Q Clear(g_c), s	48.0	34.5	13.3	48.0	0.0	48.0	18.5	28.5	1.2	7.6	37.0	19.9
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	760	646	133	0	715	264	1441	645	109	1113	497
V/C Ratio(X)	7.12	0.81	0.39	2.19	0.00	1.52	1.24	0.88	0.11	3.56	2.01	0.63
Avail Cap(c_a), veh/h	60	760	646	133	0	715	264	1441	645	109	1113	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.88	0.88	0.88	0.09	0.09	0.09
Uniform Delay (d), s/veh	60.0	32.0	25.6	56.3	0.0	36.0	41.5	10.1	7.4	56.2	41.5	35.6
Incr Delay (d2), s/veh	2787.0	6.6	0.4	557.7	0.0	240.3	135.0	7.1	0.3	1151.9	452.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	48.4	19.5	6.0	24.9	0.0	71.3	18.6	14.8	0.6	38.3	88.4	8.9
LnGrp Delay(d),s/veh	2847.0	38.6	26.0	614.0	0.0	276.3	176.5	17.2	7.7	1208.1	494.1	36.1
LnGrp LOS	F	D	C	F		F	F	B	A	F	F	D
Approach Vol, veh/h		1295			1375			1667			2930	
Approach Delay, s/veh		962.1			347.5			48.2			539.4	
Approach LOS		F			F			D			F	

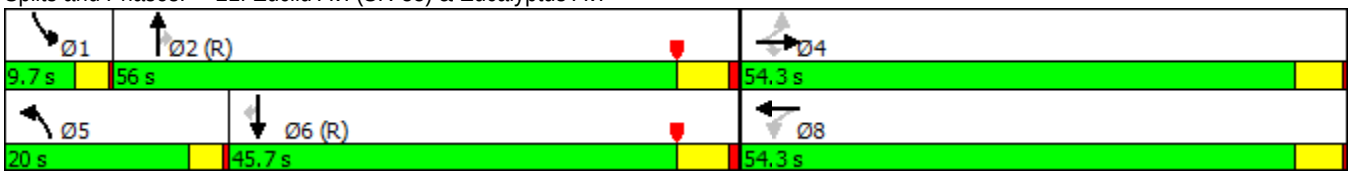
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.1	53.9		55.0	22.0	43.0		55.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	47.9		48.0	18.5	37.0		48.0
Max Q Clear Time (g_c+I1), s	9.6	30.5		50.0	20.5	39.0		50.0
Green Ext Time (p_c), s	0.0	16.7		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		465.8
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	71	10	266	76	58	220	1127	31	41	2267	88
Future Volume (vph)	71	10	266	76	58	220	1127	31	41	2267	88
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	54.3	54.3	54.3	54.3	54.3	20.0	56.0	56.0	9.7	45.7	45.7
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	16.7%	46.7%	46.7%	8.1%	38.1%	38.1%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	17.0	17.0	17.0	17.0	17.0	22.8	82.7	82.7	8.0	66.2	66.2
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.19	0.69	0.69	0.07	0.55	0.55
v/c Ratio	0.49	0.04	0.60	0.41	0.39	0.70	0.47	0.03	0.38	1.19	0.10
Control Delay	54.4	36.5	10.7	49.6	28.8	60.4	8.1	1.2	68.5	104.8	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	36.5	10.7	49.6	28.8	60.4	8.1	1.2	68.5	104.8	2.6
LOS	D	D	B	D	C	E	A	A	E	F	A
Approach Delay		20.3			37.3		16.2			100.4	
Approach LOS		C			D		B			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 53.7 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 64.3	Intersection LOS: E
Intersection Capacity Utilization 98.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	10	266	76	58	52	220	1127	31	41	2267	88
Future Volume (veh/h)	71	10	266	76	58	52	220	1127	31	41	2267	88
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	74	10	191	79	60	47	229	1174	32	43	2361	88
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	174	271	230	226	141	111	236	2559	1145	54	2177	953
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.71	0.71	0.02	0.40	0.40
Sat Flow, veh/h	1307	1900	1615	1200	989	775	1714	3610	1615	1714	3610	1579
Grp Volume(v), veh/h	74	10	191	79	0	107	229	1174	32	43	2361	88
Grp Sat Flow(s),veh/h/ln	1307	1900	1615	1200	0	1763	1714	1805	1615	1714	1805	1579
Q Serve(g_s), s	6.6	0.5	13.8	7.3	0.0	6.6	16.0	16.8	0.7	3.0	72.4	4.1
Cycle Q Clear(g_c), s	13.2	0.5	13.8	7.8	0.0	6.6	16.0	16.8	0.7	3.0	72.4	4.1
Prop In Lane	1.00		1.00	1.00		0.44	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	271	230	226	0	252	236	2559	1145	54	2177	953
V/C Ratio(X)	0.42	0.04	0.83	0.35	0.00	0.43	0.97	0.46	0.03	0.79	1.08	0.09
Avail Cap(c_a), veh/h	527	784	666	550	0	727	236	2559	1145	89	2177	953
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.0	44.3	50.0	47.7	0.0	46.9	51.5	7.5	5.2	58.3	35.8	15.4
Incr Delay (d2), s/veh	1.2	0.0	5.6	0.7	0.0	0.8	50.3	0.6	0.0	1.8	38.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.3	6.5	2.5	0.0	3.3	10.9	8.5	0.3	1.5	47.9	1.8
LnGrp Delay(d),s/veh	54.2	44.4	55.7	48.4	0.0	47.8	101.9	8.1	5.2	60.1	74.7	15.4
LnGrp LOS	D	D	E	D		D	F	A	A	E	F	B
Approach Vol, veh/h		275			186			1435			2492	
Approach Delay, s/veh		54.9			48.0			23.0			72.3	
Approach LOS		D			D			C			E	

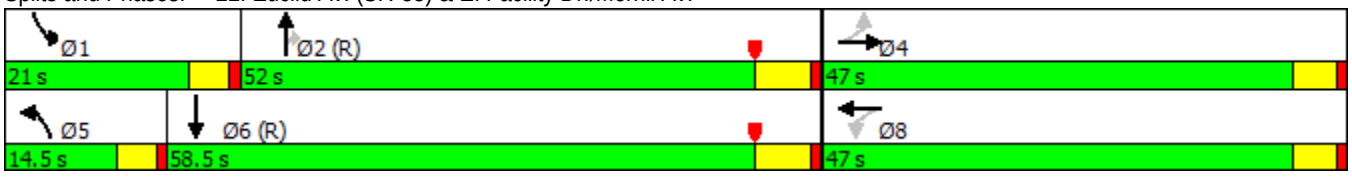
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.3	90.8		21.9	20.0	78.1		21.9
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	6.2	50.3		49.5	16.5	40.0		49.5
Max Q Clear Time (g_c+I1), s	5.0	18.8		15.8	18.0	74.4		9.8
Green Ext Time (p_c), s	0.0	29.0		1.3	0.0	0.0		1.3

Intersection Summary		
HCM 2010 Ctrl Delay		54.1
HCM 2010 LOS		D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	10	8	231	62	25	1153	159	473	2350
Future Volume (vph)	10	8	231	62	25	1153	159	473	2350
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	47.0	47.0	47.0	47.0	14.5	52.0	52.0	21.0	58.5
Total Split (%)	39.2%	39.2%	39.2%	39.2%	12.1%	43.3%	43.3%	17.5%	48.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		42.0		42.0	10.0	46.0	46.0	16.5	58.3
Actuated g/C Ratio		0.35		0.35	0.08	0.38	0.38	0.14	0.49
v/c Ratio		0.05		1.35	0.18	0.87	0.24	2.10	1.43
Control Delay		22.1		199.0	61.8	28.6	6.3	525.8	219.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		22.1		199.0	61.8	28.6	6.3	525.8	219.7
LOS		C		F	E	C	A	F	F
Approach Delay		22.1		199.0		26.6			270.0
Approach LOS		C		F		C			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 112 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.10	
Intersection Signal Delay: 193.0	Intersection LOS: F
Intersection Capacity Utilization 139.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	8	5	231	62	465	25	1153	159	473	2350	56
Future Volume (veh/h)	10	8	5	231	62	465	25	1153	159	473	2350	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	10	8	4	241	65	438	26	1201	140	493	2448	55
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	191	148	66	220	49	328	83	1384	619	236	1706	38
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.05	0.38	0.38	0.14	0.47	0.47
Sat Flow, veh/h	422	424	188	515	139	937	1714	3610	1615	1714	3610	81
Grp Volume(v), veh/h	22	0	0	744	0	0	26	1201	140	493	1219	1284
Grp Sat Flow(s),veh/h/ln	1034	0	0	1591	0	0	1714	1805	1615	1714	1805	1886
Q Serve(g_s), s	0.0	0.0	0.0	41.1	0.0	0.0	1.8	36.9	7.0	16.5	56.7	56.7
Cycle Q Clear(g_c), s	0.9	0.0	0.0	42.0	0.0	0.0	1.8	36.9	7.0	16.5	56.7	56.7
Prop In Lane	0.45		0.18	0.32		0.59	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	405	0	0	597	0	0	83	1384	619	236	853	891
V/C Ratio(X)	0.05	0.00	0.00	1.25	0.00	0.00	0.31	0.87	0.23	2.09	1.43	1.44
Avail Cap(c_a), veh/h	405	0	0	597	0	0	143	1384	619	236	853	891
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.50	0.50	0.50	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	0.0	40.3	0.0	0.0	55.2	34.2	25.0	51.7	31.6	31.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	124.7	0.0	0.0	0.4	4.0	0.4	505.4	200.1	204.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	40.4	0.0	0.0	0.8	19.1	3.2	40.9	75.6	80.1
LnGrp Delay(d),s/veh	25.7	0.0	0.0	165.0	0.0	0.0	55.6	38.2	25.4	557.2	231.8	236.3
LnGrp LOS	C			F			E	D	C	F	F	F
Approach Vol, veh/h		22			744			1367			2996	
Approach Delay, s/veh		25.7			165.0			37.2			287.3	
Approach LOS		C			F			D			F	

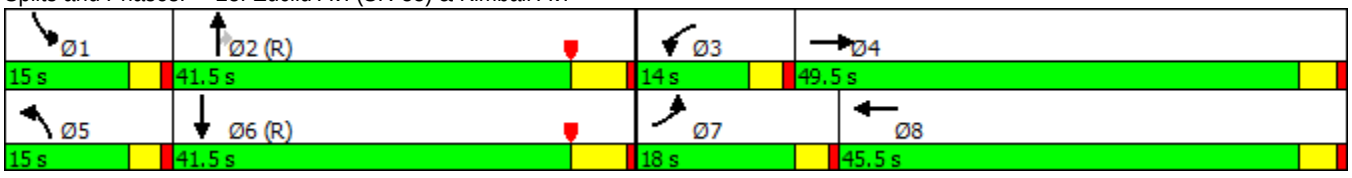
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.0	52.0		47.0	10.3	62.7		47.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	16.5	46.0		42.0	10.0	52.5		42.0
Max Q Clear Time (g_c+I1), s	18.5	38.9		2.9	3.8	58.7		44.0
Green Ext Time (p_c), s	0.0	7.0		3.5	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		201.8
HCM 2010 LOS		F

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	131	397	272	366	124	749	218	560	1479
Future Volume (vph)	131	397	272	366	124	749	218	560	1479
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	18.0	49.5	14.0	45.5	15.0	41.5	41.5	15.0	41.5
Total Split (%)	15.0%	41.3%	11.7%	37.9%	12.5%	34.6%	34.6%	12.5%	34.6%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	12.7	28.3	10.0	25.6	12.8	35.5	35.5	27.7	50.4
Actuated g/C Ratio	0.11	0.24	0.08	0.21	0.11	0.30	0.30	0.23	0.42
v/c Ratio	0.74	0.65	1.96	0.77	0.70	0.72	0.35	1.45	1.16
Control Delay	74.8	36.9	484.8	37.8	49.3	46.4	17.9	247.6	95.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	36.9	484.8	37.8	49.3	46.4	17.9	247.6	95.4
LOS	E	D	F	D	D	D	B	F	F
Approach Delay		44.3		170.1		41.1			133.2
Approach LOS		D		F		D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.96	
Intersection Signal Delay: 107.5	Intersection LOS: F
Intersection Capacity Utilization 103.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	397	150	272	366	282	124	749	218	560	1479	212
Future Volume (veh/h)	131	397	150	272	366	282	124	749	218	560	1479	212
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	134	405	151	278	373	266	127	764	214	571	1509	178
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	157	629	232	143	477	335	153	1543	690	157	1398	163
Arrive On Green	0.18	0.49	0.49	0.08	0.24	0.24	0.03	0.14	0.14	0.09	0.43	0.43
Sat Flow, veh/h	1714	2584	953	1714	2028	1426	1714	3610	1615	1714	3253	379
Grp Volume(v), veh/h	134	281	275	278	331	308	127	764	214	571	830	857
Grp Sat Flow(s),veh/h/ln	1714	1805	1732	1714	1805	1648	1714	1805	1615	1714	1805	1827
Q Serve(g_s), s	9.1	13.9	14.3	10.0	20.6	21.0	8.8	23.5	14.3	11.0	51.6	51.6
Cycle Q Clear(g_c), s	9.1	13.9	14.3	10.0	20.6	21.0	8.8	23.5	14.3	11.0	51.6	51.6
Prop In Lane	1.00		0.55	1.00		0.86	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	157	440	422	143	425	388	153	1543	690	157	776	786
V/C Ratio(X)	0.85	0.64	0.65	1.95	0.78	0.79	0.83	0.50	0.31	3.63	1.07	1.09
Avail Cap(c_a), veh/h	200	677	649	143	617	563	157	1543	690	157	776	786
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	1.00	0.83	0.83	0.83	0.09	0.09	0.09
Uniform Delay (d), s/veh	48.2	26.9	26.9	55.0	43.0	43.1	57.3	39.6	35.7	54.5	34.2	34.2
Incr Delay (d2), s/veh	14.4	1.1	1.1	450.2	2.2	2.8	23.7	0.9	1.0	1186.6	34.0	43.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	7.0	6.8	22.6	10.6	9.9	5.2	12.0	6.6	57.0	33.0	35.5
LnGrp Delay(d),s/veh	62.7	27.9	28.1	505.2	45.2	46.0	81.1	40.5	36.6	1241.1	68.2	77.7
LnGrp LOS	E	C	C	F	D	D	F	D	D	F	F	F
Approach Vol, veh/h		690			917			1105			2258	
Approach Delay, s/veh		34.7			184.9			44.4			368.4	
Approach LOS		C			F			D			F	

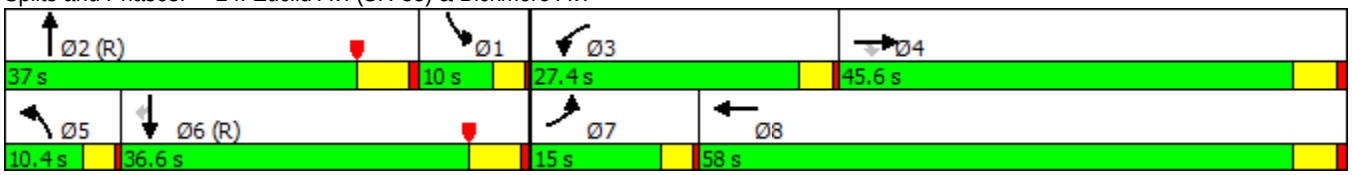
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	57.3	14.0	33.7	14.7	57.6	15.0	32.7
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.0	35.5	10.0	45.0	11.0	35.5	14.0	41.0
Max Q Clear Time (g_c+I1), s	13.0	25.5	12.0	16.3	10.8	53.6	11.1	23.0
Green Ext Time (p_c), s	0.0	8.6	0.0	5.8	0.0	0.0	0.0	5.2

Intersection Summary	
HCM 2010 Ctrl Delay	216.2
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	29	11	21	70	28	48	997	111	1629	115
Future Volume (vph)	29	11	21	70	28	48	997	111	1629	115
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	15.0	45.6	45.6	27.4	58.0	10.4	37.0	10.0	36.6	36.6
Total Split (%)	12.5%	38.0%	38.0%	22.8%	48.3%	8.7%	30.8%	8.3%	30.5%	30.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	6.8	12.0	12.0	9.6	14.5	8.1	78.2	6.5	78.3	78.3
Actuated g/C Ratio	0.06	0.10	0.10	0.08	0.12	0.07	0.65	0.05	0.65	0.65
v/c Ratio	0.32	0.06	0.07	0.54	0.37	0.44	0.54	1.28	0.74	0.11
Control Delay	62.4	42.1	0.4	67.0	19.0	56.1	11.3	175.2	11.4	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	42.1	0.4	67.0	19.0	56.1	11.3	175.2	11.4	3.1
LOS	E	D	A	E	B	E	B	F	B	A
Approach Delay		37.7			39.8		13.0		20.6	
Approach LOS		D			D		B		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 72.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	11	21	70	28	63	48	997	181	111	1629	115
Future Volume (veh/h)	29	11	21	70	28	63	48	997	181	111	1629	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	31	12	20	74	30	54	51	1061	192	118	1733	113
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	46	88	74	94	45	81	65	802	145	813	2583	1156
Arrive On Green	0.03	0.05	0.05	0.05	0.07	0.07	0.04	0.26	0.26	0.63	0.95	0.95
Sat Flow, veh/h	1714	1900	1604	1714	609	1097	1714	3056	552	1714	3610	1615
Grp Volume(v), veh/h	31	12	20	74	0	84	51	626	627	118	1733	113
Grp Sat Flow(s),veh/h/ln	1714	1900	1604	1714	0	1706	1714	1805	1803	1714	1805	1615
Q Serve(g_s), s	2.2	0.7	1.4	5.1	0.0	5.8	3.5	31.5	31.5	3.4	7.7	0.4
Cycle Q Clear(g_c), s	2.2	0.7	1.4	5.1	0.0	5.8	3.5	31.5	31.5	3.4	7.7	0.4
Prop In Lane	1.00		1.00	1.00		0.64	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	46	88	74	94	0	126	65	474	473	813	2583	1156
V/C Ratio(X)	0.67	0.14	0.27	0.79	0.00	0.66	0.79	1.32	1.33	0.15	0.67	0.10
Avail Cap(c_a), veh/h	164	643	543	341	0	754	99	474	473	813	2583	1156
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	57.9	54.9	55.3	56.0	0.0	54.1	57.3	44.3	44.3	12.3	1.0	0.8
Incr Delay (d2), s/veh	6.2	0.3	0.7	5.4	0.0	2.2	1.0	145.5	148.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.4	0.7	2.6	0.0	2.8	1.7	34.8	35.1	1.6	3.3	0.2
LnGrp Delay(d),s/veh	64.1	55.2	56.0	61.5	0.0	56.3	58.3	189.8	192.3	12.3	1.1	0.9
LnGrp LOS	E	E	E	E		E	E	F	F	B	A	A
Approach Vol, veh/h		63			158			1304			1964	
Approach Delay, s/veh		59.8			58.7			185.8			1.8	
Approach LOS		E			E			F			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	62.4	37.0	10.1	10.5	8.0	91.4	6.7	13.9
Change Period (Y+Rc), s	5.5	* 5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	6.5	* 32	23.9	40.6	6.9	31.1	11.5	53.0
Max Q Clear Time (g_c+I1), s	5.4	33.5	7.1	3.4	5.5	9.7	4.2	7.8
Green Ext Time (p_c), s	0.0	0.0	0.1	0.4	0.0	8.8	0.0	0.4

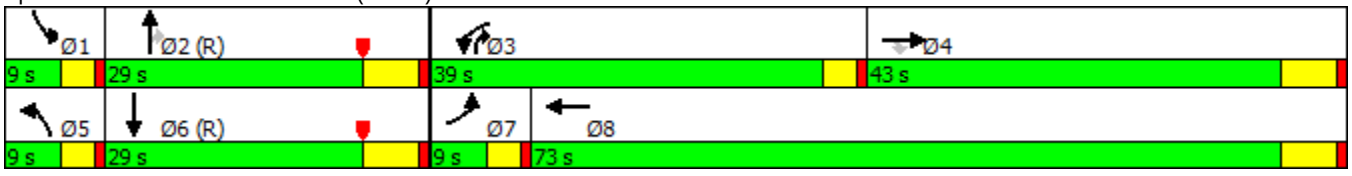
Intersection Summary	
HCM 2010 Ctrl Delay	74.2
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	329	199	705	418	186	884	518	255	1372
Future Volume (vph)	80	329	199	705	418	186	884	518	255	1372
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	39.0	73.0	9.0	29.0	39.0	9.0	29.0
Total Split (%)	7.5%	35.8%	35.8%	32.5%	60.8%	7.5%	24.2%	32.5%	7.5%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	28.0	28.0	31.3	54.3	17.7	23.0	56.3	17.7	23.0
Actuated g/C Ratio	0.04	0.23	0.23	0.26	0.45	0.15	0.19	0.47	0.15	0.19
v/c Ratio	1.14	0.75	0.42	0.87	0.78	0.75	1.29	0.60	1.02	2.15
Control Delay	201.0	52.9	15.0	54.6	32.5	61.9	172.2	10.4	98.1	545.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	201.0	52.9	15.0	54.6	32.5	61.9	172.2	10.4	98.1	545.7
LOS	F	D	B	D	C	E	F	B	F	F
Approach Delay		60.0			44.0		106.5			479.3
Approach LOS		E			D		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.15	
Intersection Signal Delay: 207.0	Intersection LOS: F
Intersection Capacity Utilization 109.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	329	199	705	418	227	186	884	518	255	1372	94
Future Volume (veh/h)	80	329	199	705	418	227	186	884	518	255	1372	94
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	81	332	0	712	422	214	188	893	345	258	1386	90
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	452	384	771	523	265	71	1112	883	71	1059	69
Arrive On Green	0.04	0.24	0.00	0.25	0.44	0.44	0.04	0.31	0.31	0.03	0.21	0.21
Sat Flow, veh/h	1714	1900	1615	3141	1184	601	1714	3610	1579	1714	3438	222
Grp Volume(v), veh/h	81	332	0	712	0	636	188	893	345	258	726	750
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1570	0	1785	1714	1805	1579	1714	1805	1855
Q Serve(g_s), s	5.0	19.4	0.0	26.5	0.0	37.1	5.0	27.3	15.0	5.0	37.0	37.0
Cycle Q Clear(g_c), s	5.0	19.4	0.0	26.5	0.0	37.1	5.0	27.3	15.0	5.0	37.0	37.0
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	71	452	384	771	0	789	71	1112	883	71	556	572
V/C Ratio(X)	1.13	0.73	0.00	0.92	0.00	0.81	2.63	0.80	0.39	3.61	1.30	1.31
Avail Cap(c_a), veh/h	71	586	498	916	0	997	71	1112	883	71	556	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.12	0.12	0.12	0.62	0.62	0.62
Uniform Delay (d), s/veh	57.5	42.2	0.0	44.2	0.0	29.0	57.5	38.2	15.3	58.3	47.6	47.6
Incr Delay (d2), s/veh	147.5	4.2	0.0	12.2	0.0	4.5	739.2	0.8	0.2	1196.7	145.3	148.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	10.7	0.0	12.8	0.0	19.2	17.0	13.8	6.5	26.1	40.9	42.5
LnGrp Delay(d),s/veh	205.0	46.5	0.0	56.4	0.0	33.5	796.7	38.9	15.5	1255.0	192.9	196.3
LnGrp LOS	F	D		E		C	F	D	B	F	F	F
Approach Vol, veh/h		413			1348			1426			1734	
Approach Delay, s/veh		77.6			45.6			133.2			352.4	
Approach LOS		E			D			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	43.0	33.5	34.6	9.0	43.0	9.0	59.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	35.0	37.0	5.0	23.0	5.0	67.0
Max Q Clear Time (g_c+I1), s	7.0	29.3	28.5	21.4	7.0	39.0	7.0	39.1
Green Ext Time (p_c), s	0.0	0.0	0.9	7.2	0.0	0.0	0.0	9.6

Intersection Summary	
HCM 2010 Ctrl Delay	181.8
HCM 2010 LOS	F

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	539	328	383	2143	234	1070
Future Volume (vph)	539	328	383	2143	234	1070
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	69.0	69.0	24.0	93.0	27.0	27.0
Total Split (%)	57.5%	57.5%	20.0%	77.5%	22.5%	22.5%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	64.5	64.5	20.5	88.5	23.5	23.5
Actuated g/C Ratio	0.54	0.54	0.17	0.74	0.20	0.20
v/c Ratio	0.29	0.33	1.37	0.84	0.40	1.60
Control Delay	32.8	18.7	219.3	12.7	44.4	294.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	18.7	219.3	12.7	44.4	294.6
LOS	C	B	F	B	D	F
Approach Delay	27.4			44.1	249.7	
Approach LOS	C			D	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.60	
Intersection Signal Delay: 98.1	Intersection LOS: F
Intersection Capacity Utilization 88.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	539	328	383	2143	234	1070
Future Volume (veh/h)	539	328	383	2143	234	1070
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1700	1900
Adj Flow Rate, veh/h	561	0	399	2232	244	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2294	1026	293	3016	307	158
Arrive On Green	1.00	0.00	0.17	0.84	0.10	0.00
Sat Flow, veh/h	3705	1615	1714	3705	3141	1615
Grp Volume(v), veh/h	561	0	399	2232	244	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1714	1805	1570	1615
Q Serve(g_s), s	0.0	0.0	20.5	32.0	9.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	20.5	32.0	9.1	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2294	1026	293	3016	307	158
V/C Ratio(X)	0.24	0.00	1.36	0.74	0.79	0.00
Avail Cap(c_a), veh/h	2294	1026	293	3016	615	316
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	49.7	4.2	53.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	165.2	0.2	4.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	23.1	15.6	4.2	0.0
LnGrp Delay(d),s/veh	0.3	0.0	214.9	4.4	57.6	0.0
LnGrp LOS	A		F	A	E	
Approach Vol, veh/h	561			2631	244	
Approach Delay, s/veh	0.3			36.3	57.6	
Approach LOS	A			D	E	

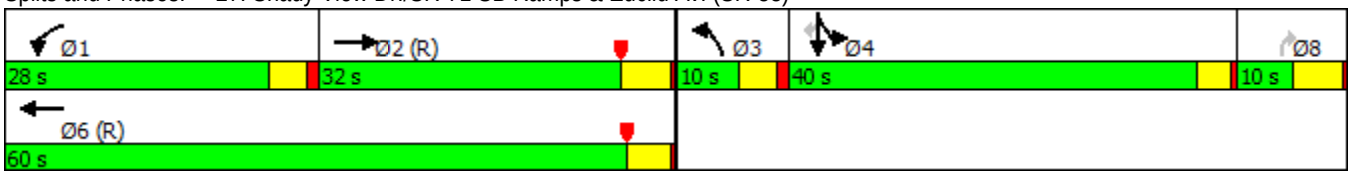
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	24.0	80.8				104.8		15.2
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	20.5	64.5				88.5		23.5
Max Q Clear Time (g_c+I1), s	22.5	2.0				34.0		11.1
Green Ext Time (p_c), s	0.0	37.1				34.3		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	1049	454	678	71	241	276	24	64
Future Volume (vph)	1049	454	678	71	241	276	24	64
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	32.0	28.0	60.0	10.0	10.0	40.0	40.0	40.0
Total Split (%)	26.7%	23.3%	50.0%	8.3%	8.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	27.0	38.5	70.5	5.5	8.0	18.5	18.5	18.5
Actuated g/C Ratio	0.22	0.32	0.59	0.05	0.07	0.15	0.15	0.15
v/c Ratio	1.45	0.91	0.35	1.00	0.75	0.66	0.62	0.19
Control Delay	244.1	54.1	7.1	159.5	19.8	59.2	56.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	244.1	54.1	7.1	159.5	19.8	59.2	56.5	1.1
LOS	F	D	A	F	B	E	E	A
Approach Delay	244.1		26.0				47.9	
Approach LOS	F		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 92.5 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 112.5	Intersection LOS: F
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1049	19	454	678	0	71	0	241	276	24	64
Future Volume (veh/h)	0	1049	19	454	678	0	71	0	241	276	24	64
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0	1800	0	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	1153	21	499	745	0	78	0	265	322	0	70
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	2094	38	336	2926	0	0	0	0	407	0	192
Arrive On Green	0.00	0.58	0.58	0.39	1.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Sat Flow, veh/h	0	3722	66	1714	3705	0		0		3429	0	1615
Grp Volume(v), veh/h	0	574	600	499	745	0		0.0		322	0	70
Grp Sat Flow(s),veh/h/ln	0	1805	1888	1714	1805	0				1714	0	1615
Q Serve(g_s), s	0.0	23.6	23.6	23.5	0.0	0.0				11.0	0.0	4.8
Cycle Q Clear(g_c), s	0.0	23.6	23.6	23.5	0.0	0.0				11.0	0.0	4.8
Prop In Lane	0.00		0.03	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1042	1090	336	2926	0				407	0	192
V/C Ratio(X)	0.00	0.55	0.55	1.49	0.25	0.00				0.79	0.00	0.37
Avail Cap(c_a), veh/h	0	1042	1090	336	2926	0				1043	0	491
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.7	15.7	36.5	0.0	0.0				51.4	0.0	48.7
Incr Delay (d2), s/veh	0.0	2.1	2.0	234.2	0.2	0.0				3.5	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.4	12.9	32.8	0.1	0.0				5.4	0.0	2.2
LnGrp Delay(d),s/veh	0.0	17.8	17.7	270.7	0.2	0.0				54.9	0.0	49.9
LnGrp LOS		B	B	F	A					D		D
Approach Vol, veh/h		1174			1244						392	
Approach Delay, s/veh		17.8			108.7						54.0	
Approach LOS		B			F						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	28.0	74.3		17.7		102.3		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	23.5	27.0		36.5		* 56		
Max Q Clear Time (g_c+I1), s	25.5	25.6		13.0		2.0		
Green Ext Time (p_c), s	0.0	1.1		1.3		11.4		

Intersection Summary	
HCM 2010 Ctrl Delay	63.1
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	315	1043	6	0	5
Future Vol, veh/h	0	315	1043	6	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	342	1134	7	0	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1137
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	248
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	248
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	248
HCM Lane V/C Ratio	-	-	-	0.022
HCM Control Delay (s)	-	-	-	19.8
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	315	1045	6	0	4
Future Vol, veh/h	0	315	1045	6	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	342	1136	7	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1139
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	247
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	247
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	247
HCM Lane V/C Ratio	-	-	-	0.018
HCM Control Delay (s)	-	-	-	19.8
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1055	216	16	927	41	3
Future Volume (vph)	1055	216	16	927	41	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.2	24.2	9.6	24.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	72.8	72.8	5.0	76.3	12.9	12.9
Actuated g/C Ratio	0.72	0.72	0.05	0.76	0.13	0.13
v/c Ratio	0.88	0.20	0.21	0.74	0.22	0.02
Control Delay	23.0	2.1	56.6	12.3	42.2	25.0
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0
Total Delay	23.0	2.1	56.6	12.7	42.2	25.0
LOS	C	A	E	B	D	C
Approach Delay	19.5			13.5	41.1	
Approach LOS	B			B	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.6	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 76.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1055	216	16	927	41	3
Future Volume (veh/h)	1055	216	16	927	41	3
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1147	235	17	1008	45	3
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1275	1084	31	1397	170	161
Arrive On Green	0.71	0.71	0.02	0.78	0.11	0.11
Sat Flow, veh/h	1800	1530	1619	1800	1619	1530
Grp Volume(v), veh/h	1147	235	17	1008	45	3
Grp Sat Flow(s),veh/h/ln	1800	1530	1619	1800	1619	1530
Q Serve(g_s), s	48.7	5.0	1.0	27.1	2.4	0.2
Cycle Q Clear(g_c), s	48.7	5.0	1.0	27.1	2.4	0.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1275	1084	31	1397	170	161
V/C Ratio(X)	0.90	0.22	0.55	0.72	0.26	0.02
Avail Cap(c_a), veh/h	1366	1161	85	1547	460	435
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	4.8	46.2	5.4	39.1	38.1
Incr Delay (d2), s/veh	8.0	0.1	5.6	1.5	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	26.4	2.1	0.5	13.7	1.1	0.1
LnGrp Delay(d),s/veh	19.2	4.9	51.8	6.9	39.9	38.2
LnGrp LOS	B	A	D	A	D	D
Approach Vol, veh/h	1382			1025	48	
Approach Delay, s/veh	16.7			7.7	39.8	
Approach LOS	B			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.4	73.5				79.9		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	3.0	50.7				29.1		4.4
Green Ext Time (p_c), s	0.0	16.7				31.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	0	45	221	11
Future Vol, veh/h	0	5	0	45	221	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	5	0	49	240	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	246	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	798	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	798	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	798	-	-
HCM Lane V/C Ratio	-	0.007	-	-
HCM Control Delay (s)	-	9.5	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	12	33	5	61	166
Future Vol, veh/h	1	12	33	5	61	166
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	13	36	5	66	180

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	352	39	0	0	41	0
Stage 1	39	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	650	1038	-	-	1581	-
Stage 1	989	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	620	1038	-	-	1581	-
Mov Cap-2 Maneuver	633	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	712	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	989	1581	-
HCM Lane V/C Ratio	-	-	0.014	0.042	-
HCM Control Delay (s)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	4	35	5	18	148
Future Vol, veh/h	1	4	35	5	18	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	4	38	5	20	161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	241	41	0	0	43	0
Stage 1	41	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	7.1	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	717	1036	-	-	1579	-
Stage 1	979	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	709	1036	-	-	1579	-
Mov Cap-2 Maneuver	707	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	795	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	948	1579	-
HCM Lane V/C Ratio	-	-	0.006	0.012	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	2	12	39	143	6
Future Vol, veh/h	1	2	12	39	143	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	2	13	42	155	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	227	159	162	0	-	0
Stage 1	159	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	766	892	1429	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	759	892	1429	-	-	-
Mov Cap-2 Maneuver	759	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1429	-	843	-	-
HCM Lane V/C Ratio	0.009	-	0.004	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	50	5	5	140
Future Vol, veh/h	1	1	50	5	5	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	1	54	5	5	152

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	220	57	0	0	60	0
Stage 1	57	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	773	1015	-	-	1556	-
Stage 1	971	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	770	1015	-	-	1556	-
Mov Cap-2 Maneuver	763	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	868	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	871	1556	-
HCM Lane V/C Ratio	-	-	0.002	0.003	-
HCM Control Delay (s)	-	-	9.1	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	1	33	48	110	31
Future Vol, veh/h	7	1	33	48	110	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	1	36	52	120	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	260	136	153	0	-	0
Stage 1	136	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	733	918	1440	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	714	918	1440	-	-	-
Mov Cap-2 Maneuver	732	-	-	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	3.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1440	-	751	-	-
HCM Lane V/C Ratio	0.025	-	0.012	-	-
HCM Control Delay (s)	7.6	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	2	11	74	85	26
Future Vol, veh/h	6	2	11	74	85	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	2	12	80	92	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	211	107	121	0	-	0
Stage 1	107	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	782	953	1479	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	776	953	1479	-	-	-
Mov Cap-2 Maneuver	774	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	918	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1479	-	812	-	-
HCM Lane V/C Ratio	0.008	-	0.011	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	2	11	79	53	33
Future Vol, veh/h	6	2	11	79	53	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	2	12	86	58	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	186	76	93	0	-	0
Stage 1	76	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	808	991	1514	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	802	991	1514	-	-	-
Mov Cap-2 Maneuver	790	-	-	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	913	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	832	-	-
HCM Lane V/C Ratio	0.008	-	0.01	-	-
HCM Control Delay (s)	7.4	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	8	87	45	11
Future Vol, veh/h	2	2	8	87	45	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	2	9	95	49	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	167	55	61	0	-	0
Stage 1	55	-	-	-	-	-
Stage 2	112	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	828	1018	1555	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	918	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	823	1018	1555	-	-	-
Mov Cap-2 Maneuver	802	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1555	-	897	-	-
HCM Lane V/C Ratio	0.006	-	0.005	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	7	53	91	28	18
Future Vol, veh/h	4	7	53	91	28	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	8	58	99	30	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	254	40	50	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	739	1037	1570	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	826	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	710	1037	1570	-	-	-
Mov Cap-2 Maneuver	707	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	794	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1570	-	887	-	-
HCM Lane V/C Ratio	0.037	-	0.013	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	32	142	24	11
Future Vol, veh/h	2	2	32	142	24	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	2	35	154	26	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	256	32	38	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	224	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	737	1048	1585	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	719	1048	1585	-	-	-
Mov Cap-2 Maneuver	712	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1585	-	848	-	-
HCM Lane V/C Ratio	0.022	-	0.005	-	-
HCM Control Delay (s)	7.3	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	153	162	1030	22	6	20
Future Vol, veh/h	153	162	1030	22	6	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	166	176	1120	24	7	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1120	0	-	0	1629	1120
Stage 1	-	-	-	-	1120	-
Stage 2	-	-	-	-	509	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	631	-	-	-	113	254
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	608	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	631	-	-	-	83	254
Mov Cap-2 Maneuver	-	-	-	-	255	-
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	448	-

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	20.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	631	-	-	-	255	254
HCM Lane V/C Ratio	0.264	-	-	-	0.026	0.086
HCM Control Delay (s)	12.7	-	-	-	19.5	20.5
HCM Lane LOS	B	-	-	-	C	C
HCM 95th %tile Q(veh)	1.1	-	-	-	0.1	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1031	27	0	943	0	5
Future Vol, veh/h	1031	27	0	943	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1121	29	0	1025	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	560
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	477
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	477
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.6
HCM LOS			B

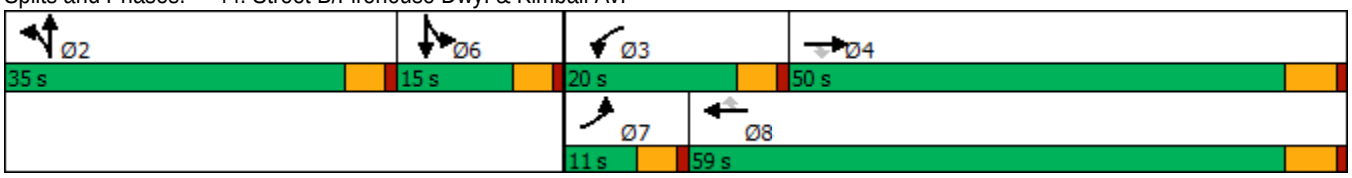
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	477	-	-	-
HCM Lane V/C Ratio	0.011	-	-	-
HCM Control Delay (s)	12.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	4	767	265	79	884	0	0
Future Volume (vph)	4	767	265	79	884	0	0
Turn Type	Prot	NA	Perm	Prot	NA	NA	NA
Protected Phases	7	4		3	8	2	6
Permitted Phases			4				
Detector Phase	7	4	4	3	8	2	6
Switch Phase							
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.8	23.8	9.6	15.8	31.6	14.6
Total Split (s)	11.0	50.0	50.0	20.0	59.0	35.0	15.0
Total Split (%)	9.2%	41.7%	41.7%	16.7%	49.2%	29.2%	12.5%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Max	Max	None	Max	None	None
Act Effct Green (s)	5.2	52.3	52.3	8.5	61.9	12.8	10.3
Actuated g/C Ratio	0.06	0.62	0.62	0.10	0.73	0.15	0.12
v/c Ratio	0.04	0.36	0.23	0.48	0.37	0.17	0.00
Control Delay	45.0	13.5	2.7	47.2	8.9	0.9	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	13.5	2.7	47.2	8.9	0.9	40.0
LOS	D	B	A	D	A	A	D
Approach Delay		10.9			12.0	0.9	40.0
Approach LOS		B			B	A	D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 84.3
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 11.1 — Intersection LOS: B
Intersection Capacity Utilization 49.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	767	265	79	884	0	59	0	6	1	0	0
Future Volume (veh/h)	4	767	265	79	884	0	59	0	6	1	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	4	843	181	87	971	0	65	0	7	1	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	9	2255	958	111	2357	1054	159	0	17	5	0	0
Arrive On Green	0.01	0.59	0.59	0.06	0.65	0.00	0.10	0.00	0.10	0.00	0.00	0.00
Sat Flow, veh/h	1714	3800	1615	1714	3610	1615	1615	0	174	1809	0	0
Grp Volume(v), veh/h	4	843	181	87	971	0	72	0	0	1	0	0
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	1805	1615	1789	0	0	1810	0	0
Q Serve(g_s), s	0.2	9.4	4.2	4.1	10.4	0.0	3.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	9.4	4.2	4.1	10.4	0.0	3.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.90		0.10	1.00		0.00
Lane Grp Cap(c), veh/h	9	2255	958	111	2357	1054	176	0	0	5	0	0
V/C Ratio(X)	0.44	0.37	0.19	0.78	0.41	0.00	0.41	0.00	0.00	0.20	0.00	0.00
Avail Cap(c_a), veh/h	135	2255	958	324	2357	1054	667	0	0	231	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	40.4	8.7	7.6	37.6	6.7	0.0	34.5	0.0	0.0	40.5	0.0	0.0
Incr Delay (d2), s/veh	11.9	0.5	0.4	4.5	0.5	0.0	1.5	0.0	0.0	18.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.1	2.0	2.1	5.3	0.0	1.6	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	52.3	9.1	8.0	42.1	7.3	0.0	36.0	0.0	0.0	59.3	0.0	0.0
LnGrp LOS	D	A	A	D	A		D			E		
Approach Vol, veh/h		1028			1058			72			1	
Approach Delay, s/veh		9.1			10.1			36.0			59.3	
Approach LOS		A			B			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.6	9.9	54.2		4.8	5.0	59.0
Change Period (Y+Rc), s		4.6	4.6	5.8		4.6	4.6	5.8
Max Green Setting (Gmax), s		30.4	15.4	44.2		10.4	6.4	53.2
Max Q Clear Time (g_c+I1), s		5.1	6.1	11.4		2.0	2.2	12.4
Green Ext Time (p_c), s		0.3	0.1	6.5		0.0	0.0	7.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	0	0	0	0	7	0	48	0	44	251	49
Future Vol, veh/h	9	0	0	0	0	7	0	48	0	44	251	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	0	0	0	0	8	0	52	0	48	273	53

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	451	447	299	447	474	52	326	0	0	52	0	0
Stage 1	395	395	-	52	52	-	-	-	-	-	-	-
Stage 2	56	52	-	395	422	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	522	509	745	525	492	1021	1245	-	-	1567	-	-
Stage 1	634	608	-	966	856	-	-	-	-	-	-	-
Stage 2	961	856	-	634	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	503	490	745	510	473	1021	1245	-	-	1567	-	-
Mov Cap-2 Maneuver	503	490	-	510	473	-	-	-	-	-	-	-
Stage 1	634	585	-	966	856	-	-	-	-	-	-	-
Stage 2	954	856	-	610	570	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	8.6	0	0.9
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1245	-	-	503	1021	1567	-	-
HCM Lane V/C Ratio	-	-	-	0.019	0.007	0.031	-	-
HCM Control Delay (s)	0	-	-	12.3	8.6	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	47	246	5
Future Vol, veh/h	1	0	0	47	246	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	0	0	51	267	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	321	270	273	0	-	0
Stage 1	270	-	-	-	-	-
Stage 2	51	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	677	774	1302	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	677	774	1302	-	-	-
Mov Cap-2 Maneuver	677	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	977	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1302	-	677	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	10.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	17	0	155	91
Future Vol, veh/h	0	30	17	0	155	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	33	18	0	168	99

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	454	18	0	0	18	0
Stage 1	18	-	-	-	-	-
Stage 2	436	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	568	1066	-	-	1612	-
Stage 1	1010	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	506	1066	-	-	1612	-
Mov Cap-2 Maneuver	506	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	584	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	4.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1066	1612	-
HCM Lane V/C Ratio	-	-	0.031	0.105	-
HCM Control Delay (s)	-	-	8.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.3	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	760	16	0	963	0	4
Future Vol, veh/h	760	16	0	963	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	826	17	0	1047	0	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	413
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	594
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	594
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	594	-	-	-
HCM Lane V/C Ratio	0.007	-	-	-
HCM Control Delay (s)	11.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	741	23	9	922	41	29
Future Vol, veh/h	741	23	9	922	41	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	772	24	9	960	43	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	796	0	1763	398
Stage 1	-	-	-	-	784	-
Stage 2	-	-	-	-	979	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	835	-	85	607
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	367	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	835	-	84	607
Mov Cap-2 Maneuver	-	-	-	-	271	-
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	363	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	271	607	-	-	835	-
HCM Lane V/C Ratio	0.158	0.05	-	-	0.011	-
HCM Control Delay (s)	20.8	11.2	-	-	9.4	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	746	23	98	947	41	141
Future Vol, veh/h	746	23	98	947	41	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	777	24	102	986	43	147

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	801	0	1980	401
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	1191	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	831	-	61	604
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	291	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	831	-	54	604
Mov Cap-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	255	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	210	604	-	-	831	-
HCM Lane V/C Ratio	0.203	0.243	-	-	0.123	-
HCM Control Delay (s)	26.5	12.9	-	-	9.9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.9	-	-	0.4	-

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	735	43	883	47	86
Future Volume (vph)	735	43	883	47	86
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	34.0	9.6	43.6	16.4	16.4
Total Split (%)	56.7%	16.0%	72.7%	27.3%	27.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	26.5	5.1	31.8	11.5	11.5
Actuated g/C Ratio	0.48	0.09	0.58	0.21	0.21
v/c Ratio	0.49	0.30	0.88	0.15	0.23
Control Delay	11.2	30.8	20.7	21.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	30.8	20.7	21.3	7.3
LOS	B	C	C	C	A
Approach Delay	11.2		21.2	12.3	
Approach LOS	B		C	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 54.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	735	35	43	883	47	86
Future Volume (veh/h)	735	35	43	883	47	86
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	808	38	47	970	52	92
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1649	78	79	1137	344	324
Arrive On Green	0.47	0.47	0.05	0.60	0.20	0.20
Sat Flow, veh/h	3602	165	1714	1900	1714	1615
Grp Volume(v), veh/h	416	430	47	970	52	92
Grp Sat Flow(s),veh/h/ln	1805	1867	1714	1900	1714	1615
Q Serve(g_s), s	8.9	8.9	1.5	23.6	1.4	2.7
Cycle Q Clear(g_c), s	8.9	8.9	1.5	23.6	1.4	2.7
Prop In Lane		0.09	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	849	878	79	1137	344	324
V/C Ratio(X)	0.49	0.49	0.59	0.85	0.15	0.28
Avail Cap(c_a), veh/h	892	922	152	1263	344	324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.3	10.3	26.3	9.3	18.5	19.0
Incr Delay (d2), s/veh	0.4	0.4	2.6	5.4	0.9	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	4.6	0.8	13.8	0.8	1.4
LnGrp Delay(d),s/veh	10.7	10.7	28.9	14.7	19.4	21.2
LnGrp LOS	B	B	C	B	B	C
Approach Vol, veh/h	846			1017	144	
Approach Delay, s/veh	10.7			15.4	20.6	
Approach LOS	B			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.2	32.7				39.9		16.4
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	27.8				37.4		11.3
Max Q Clear Time (g_c+I1), s	3.5	10.9				25.6		4.7
Green Ext Time (p_c), s	0.0	10.4				8.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	852	176	998	47	199
Future Volume (vph)	852	176	998	47	199
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.3	9.6	44.9	15.1	15.1
Total Split (%)	58.8%	16.0%	74.8%	25.2%	25.2%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	26.1	5.0	35.7	10.1	10.1
Actuated g/C Ratio	0.46	0.09	0.62	0.18	0.18
v/c Ratio	0.59	1.29	0.92	0.17	0.47
Control Delay	13.0	200.2	24.6	23.2	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	200.2	24.6	23.2	7.8
LOS	B	F	C	C	A
Approach Delay	13.0		50.9	10.7	
Approach LOS	B		D	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.29	
Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 70.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	852	35	176	998	47	199
Future Volume (veh/h)	852	35	176	998	47	199
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	936	38	193	1097	52	216
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1670	68	146	1210	292	276
Arrive On Green	0.47	0.47	0.09	0.64	0.17	0.17
Sat Flow, veh/h	3628	143	1714	1900	1714	1615
Grp Volume(v), veh/h	478	496	193	1097	52	216
Grp Sat Flow(s),veh/h/ln	1805	1871	1714	1900	1714	1615
Q Serve(g_s), s	11.1	11.1	5.0	29.1	1.5	7.5
Cycle Q Clear(g_c), s	11.1	11.1	5.0	29.1	1.5	7.5
Prop In Lane		0.08	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	853	885	146	1210	292	276
V/C Ratio(X)	0.56	0.56	1.32	0.91	0.18	0.78
Avail Cap(c_a), veh/h	896	929	146	1254	292	276
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	11.1	26.8	9.2	20.8	23.3
Incr Delay (d2), s/veh	0.7	0.7	183.7	9.5	1.3	19.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	5.8	9.8	18.1	0.8	4.8
LnGrp Delay(d),s/veh	11.8	11.8	210.5	18.7	22.1	43.0
LnGrp LOS	B	B	F	B	C	D
Approach Vol, veh/h	974			1290	268	
Approach Delay, s/veh	11.8			47.4	38.9	
Approach LOS	B			D	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.6	33.9				43.5		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	29.1				38.7		10.0
Max Q Clear Time (g_c+I1), s	7.0	13.1				31.1		9.5
Green Ext Time (p_c), s	0.0	11.5				6.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	32.8
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	683	144	726	200	191
Future Volume (vph)	683	144	726	200	191
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	20.4	5.4	30.5	13.5	13.5
Actuated g/C Ratio	0.37	0.10	0.56	0.25	0.25
v/c Ratio	0.71	0.96	0.77	0.54	0.53
Control Delay	17.8	93.0	15.3	24.8	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	93.0	15.3	24.8	23.2
LOS	B	F	B	C	C
Approach Delay	17.8		28.2	24.0	
Approach LOS	B		C	C	

Intersection Summary		
Cycle Length: 60		
Actuated Cycle Length: 54.8		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.96		
Intersection Signal Delay: 23.3	Intersection LOS: C	
Intersection Capacity Utilization 58.9%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	683	139	144	726	200	191
Future Volume (veh/h)	683	139	144	726	200	191
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	767	156	162	816	225	197
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1152	234	166	1076	411	388
Arrive On Green	0.39	0.39	0.10	0.57	0.24	0.24
Sat Flow, veh/h	3069	605	1714	1900	1714	1615
Grp Volume(v), veh/h	466	457	162	816	225	197
Grp Sat Flow(s),veh/h/ln	1805	1774	1714	1900	1714	1615
Q Serve(g_s), s	11.9	11.9	5.3	18.2	6.4	5.9
Cycle Q Clear(g_c), s	11.9	11.9	5.3	18.2	6.4	5.9
Prop In Lane		0.34	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	699	687	166	1076	411	388
V/C Ratio(X)	0.67	0.67	0.98	0.76	0.55	0.51
Avail Cap(c_a), veh/h	834	820	166	1218	411	388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.1	14.1	25.2	9.2	18.6	18.4
Incr Delay (d2), s/veh	1.6	1.6	62.6	2.5	5.1	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	6.0	5.3	10.0	3.6	3.1
LnGrp Delay(d),s/veh	15.7	15.7	87.8	11.7	23.7	23.1
LnGrp LOS	B	B	F	B	C	C
Approach Vol, veh/h	923			978	422	
Approach Delay, s/veh	15.7			24.3	23.4	
Approach LOS	B			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.0	27.8				37.8		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	7.3	13.9				20.2		8.4
Green Ext Time (p_c), s	0.0	7.7				9.2		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	914	144	979	194	191
Future Volume (vph)	914	144	979	194	191
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	32.0	10.0	42.0	18.0	18.0
Total Split (%)	53.3%	16.7%	70.0%	30.0%	30.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	25.8	5.4	35.8	13.4	13.4
Actuated g/C Ratio	0.43	0.09	0.60	0.22	0.22
v/c Ratio	0.78	1.06	0.97	0.57	0.58
Control Delay	19.2	122.7	35.1	27.6	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	122.7	35.1	27.6	26.3
LOS	B	F	D	C	C
Approach Delay	19.2		46.4	26.9	
Approach LOS	B		D	C	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 32.3	Intersection LOS: C
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	914	138	144	979	194	191
Future Volume (veh/h)	914	138	144	979	194	191
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1027	155	162	1100	218	197
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1347	203	154	1133	383	361
Arrive On Green	0.43	0.43	0.09	0.60	0.22	0.22
Sat Flow, veh/h	3229	472	1714	1900	1714	1615
Grp Volume(v), veh/h	591	591	162	1100	218	197
Grp Sat Flow(s),veh/h/ln	1805	1802	1714	1900	1714	1615
Q Serve(g_s), s	16.6	16.7	5.4	33.3	6.8	6.5
Cycle Q Clear(g_c), s	16.6	16.7	5.4	33.3	6.8	6.5
Prop In Lane		0.26	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	776	774	154	1133	383	361
V/C Ratio(X)	0.76	0.76	1.05	0.97	0.57	0.55
Avail Cap(c_a), veh/h	777	775	154	1134	383	361
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.5	14.5	27.3	11.6	20.7	20.6
Incr Delay (d2), s/veh	4.5	4.5	86.2	19.9	6.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.1	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	9.2	6.2	23.4	3.8	3.5
LnGrp Delay(d),s/veh	19.0	19.0	113.5	31.5	26.7	26.4
LnGrp LOS	B	B	F	C	C	C
Approach Vol, veh/h	1182			1262	415	
Approach Delay, s/veh	19.0			42.1	26.6	
Approach LOS	B			D	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.0	32.0				42.0		18.0
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.4	25.8				35.8		13.4
Max Q Clear Time (g_c+I1), s	7.4	18.7				35.3		8.8
Green Ext Time (p_c), s	0.0	6.1				0.5		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	103.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	321	512	41	12	624	56	52	25	23	132	16	194
Future Vol, veh/h	321	512	41	12	624	56	52	25	23	132	16	194
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	338	539	43	13	657	59	55	26	24	139	17	204

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	717	0	0	584	0	0	2060	1980	294	1672	1973	687
Stage 1	-	-	-	-	-	-	1238	1238	-	713	713	-
Stage 2	-	-	-	-	-	-	822	742	-	959	1260	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	893	-	-	1001	-	-	~ 37	62	708	~ 70	63	450
Stage 1	-	-	-	-	-	-	189	250	-	426	438	-
Stage 2	-	-	-	-	-	-	371	425	-	280	244	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	893	-	-	1000	-	-	~ 13	38	706	~ 33	39	450
Mov Cap-2 Maneuver	-	-	-	-	-	-	286	63	-	~ 91	108	-
Stage 1	-	-	-	-	-	-	117	155	-	265	432	-
Stage 2	-	-	-	-	-	-	192	419	-	139	151	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.2	0.1	59.7	$ 578.2
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	164	893	-	-	1000	-	-	168
HCM Lane V/C Ratio	0.642	0.378	-	-	0.013	-	-	2.143
HCM Control Delay (s)	59.7	11.5	-	-	8.6	-	-	$ 578.2
HCM Lane LOS	F	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	3.6	1.8	-	-	0	-	-	28.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	429.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	319	745	41	12	888	279	52	25	23	207	16	183
Future Vol, veh/h	319	745	41	12	888	279	52	25	23	207	16	183
Conflicting Peds, #/hr	0	0	2	0	0	1	0	0	1	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	336	784	43	13	935	294	55	26	24	218	17	193

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1229	0	0	829	0	0	2691	2734	417	2186	2609	1083
Stage 1	-	-	-	-	-	-	1479	1479	-	1108	1108	-
Stage 2	-	-	-	-	-	-	1212	1255	-	1078	1501	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	574	-	-	811	-	-	~ 12	~ 21	590	~ 29	25	266
Stage 1	-	-	-	-	-	-	134	191	-	257	288	-
Stage 2	-	-	-	-	-	-	225	245	-	237	187	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	574	-	-	810	-	-	~ 1	~ 9	588	~ 13	~ 10	266
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	204	-	~ 36	50	-
Stage 1	-	-	-	-	-	-	55	79	-	~ 106	283	-
Stage 2	-	-	-	-	-	-	57	241	-	~ 63	77	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.7	0.1	184	$ 2888.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	100	574	-	-	810	-	-	60
HCM Lane V/C Ratio	1.053	0.585	-	-	0.016	-	-	7.123
HCM Control Delay (s)	184	19.7	-	-	9.5	-	-	$ 2888.4
HCM Lane LOS	F	C	-	-	A	-	-	F
HCM 95th %tile Q(veh)	6.6	3.8	-	-	0	-	-	49.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	538	20	33	596	8	79	0	28	2	0	16
Future Vol, veh/h	109	538	20	33	596	8	79	0	28	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	591	22	36	655	9	87	0	31	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	664	0	0	614	0	0	1581	1576	308	1265	1583	659
Stage 1	-	-	-	-	-	-	840	840	-	732	732	-
Stage 2	-	-	-	-	-	-	741	736	-	533	851	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	935	-	-	975	-	-	~ 82	111	694	137	110	467
Stage 1	-	-	-	-	-	-	330	384	-	416	430	-
Stage 2	-	-	-	-	-	-	411	428	-	503	379	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	935	-	-	975	-	-	~ 69	93	693	115	92	467
Mov Cap-2 Maneuver	-	-	-	-	-	-	196	227	-	115	92	-
Stage 1	-	-	-	-	-	-	288	335	-	363	414	-
Stage 2	-	-	-	-	-	-	381	412	-	420	331	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.5	33.4	16
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	241	935	-	-	975	-	-	348
HCM Lane V/C Ratio	0.488	0.127	-	-	0.037	-	-	0.056
HCM Control Delay (s)	33.4	9.4	-	-	8.8	-	-	16
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	2.5	0.4	-	-	0.1	-	-	0.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	21.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	846	20	33	1084	8	79	0	28	2	0	16
Future Vol, veh/h	109	846	20	33	1084	8	79	0	28	2	0	16
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	91	92	91	92	91	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	118	930	22	36	1191	9	87	0	31	2	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1200	0	0	953	0	0	2456	2451	477	1970	2458	1196
Stage 1	-	-	-	-	-	-	1179	1179	-	1268	1268	-
Stage 2	-	-	-	-	-	-	1277	1272	-	702	1190	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	589	-	-	729	-	-	~ 19	31	540	43	31	229
Stage 1	-	-	-	-	-	-	206	267	-	209	242	-
Stage 2	-	-	-	-	-	-	206	241	-	400	263	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	589	-	-	729	-	-	~ 14	24	539	33	24	229
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 56	95	-	33	24	-
Stage 1	-	-	-	-	-	-	165	213	-	167	230	-
Stage 2	-	-	-	-	-	-	181	229	-	302	210	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.3	$ 425.5	35.3
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	73	589	-	-	729	-	-	138
HCM Lane V/C Ratio	1.611	0.201	-	-	0.05	-	-	0.142
HCM Control Delay (s)	$ 425.5	12.6	-	-	10.2	-	-	35.3
HCM Lane LOS	F	B	-	-	B	-	-	E
HCM 95th %tile Q(veh)	10	0.7	-	-	0.2	-	-	0.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	173.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	256	175	137	0	99	261	50	0	190	521	148
Future Vol, veh/h	0	256	175	137	0	99	261	50	0	190	521	148
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	275	188	147	0	106	281	54	0	204	560	159
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	3
HCM Control Delay	38	43.2	382.5
HCM LOS	E	E	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	78%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	22%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	669	256	175	137	99	261	50	21	135	186
LT Vol	190	0	256	0	0	99	0	0	21	0	0
Through Vol	0	521	0	175	0	0	261	0	0	135	0
RT Vol	0	148	0	0	137	0	0	50	0	0	186
Lane Flow Rate	204	719	275	188	147	106	281	54	23	145	200
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.606	2.002	0.825	0.538	0.393	0.332	0.838	0.15	0.073	0.447	0.578
Departure Headway (Hd)	10.675	10.021	12.444	11.919	11.185	12.969	12.443	11.708	13.182	12.661	11.932
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	339	367	295	305	324	279	295	308	273	286	304
Service Time	8.429	7.774	10.144	9.619	8.885	10.669	10.143	9.408	10.882	10.361	9.632
HCM Lane V/C Ratio	0.602	1.959	0.932	0.616	0.454	0.38	0.953	0.175	0.084	0.507	0.658
HCM Control Delay	28.6	483	54.3	27.7	20.9	22	56.3	16.5	16.9	25.2	29.8
HCM Lane LOS	D	F	F	D	C	C	F	C	C	D	D
HCM 95th-tile Q	3.8	50.1	6.8	3	1.8	1.4	7	0.5	0.2	2.2	3.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	21	135	186
Future Vol, veh/h	0	21	135	186
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	23	145	200
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	27.2
HCM LOS	D

Intersection	
Intersection Delay, s/veh	491.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	256	487	133	0	331	770	50	0	168	521	298
Future Vol, veh/h	0	256	487	133	0	331	770	50	0	168	521	298
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	275	524	143	0	356	828	54	0	181	560	320
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	3
HCM Control Delay	232.5	590.4	762.8
HCM LOS	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	64%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	36%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	168	819	256	487	133	331	770	50	21	135	186
LT Vol	168	0	256	0	0	331	0	0	21	0	0
Through Vol	0	521	0	487	0	0	770	0	0	135	0
RT Vol	0	298	0	0	133	0	0	50	0	0	186
Lane Flow Rate	181	881	275	524	143	356	828	54	23	145	200
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.64	2.938	0.926	1.688	0.434	1.21	2.702	0.165	0.084	0.517	0.674
Departure Headway (Hd)	15.24	14.486	16.68	16.154	15.418	16.013	15.482	14.737	15.464	14.941	14.21
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	238	264	220	230	236	231	248	245	233	242	256
Service Time	12.94	12.186	14.38	13.854	13.118	13.713	13.182	12.437	13.164	12.641	11.91
HCM Lane V/C Ratio	0.761	3.337	1.25	2.278	0.606	1.541	3.339	0.22	0.099	0.599	0.781
HCM Control Delay	41.6	910.7	87.7	364	29.4	170.6	807.9	20.3	19.6	32.6	42
HCM Lane LOS	E	F	F	F	D	F	F	C	C	D	E
HCM 95th-tile Q	3.9	64.5	7.7	24.8	2	13.5	53.8	0.6	0.3	2.7	4.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	21	135	186
Future Vol, veh/h	0	21	135	186
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	23	145	200
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	36.9
HCM LOS	E

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	514	1326	1376	812	656	1319	
Future Volume (vph)	514	1326	1376	812	656	1319	
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA	
Protected Phases	3	1	2	3	1	6	8
Permitted Phases		8		2			
Detector Phase	3	1	2	3	1	6	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0	36.3
Total Split (s)	36.3	27.0	56.7	36.3	27.0	83.7	36.3
Total Split (%)	30.3%	22.5%	47.3%	30.3%	22.5%	69.8%	30%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0	
Lead/Lag		Lead	Lag		Lead		
Lead-Lag Optimize?		Yes	Yes		Yes		
Recall Mode	None	None	Min	None	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	514	0	1326	0	1376	812	656	1319	0
Future Volume (veh/h)	0	0	0	514	0	1326	0	1376	812	656	1319	0
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	0	1900	0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h				535	0	1316	0	1433	846	683	1374	0
Adj No. of Lanes				1	0	1	0	1	1	1	1	0
Peak Hour Factor				0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				466	0	712	0	817	1096	331	1243	0
Arrive On Green				0.26	0.00	0.26	0.00	0.43	0.43	0.18	0.65	0.00
Sat Flow, veh/h				1810	0	1615	0	1900	1581	1810	1900	0
Grp Volume(v), veh/h				535	0	1316	0	1433	846	683	1374	0
Grp Sat Flow(s),veh/h/ln				1810	0	1615	0	1900	1581	1810	1900	0
Q Serve(g_s), s				31.0	0.0	31.0	0.0	51.7	43.3	22.0	78.7	0.0
Cycle Q Clear(g_c), s				31.0	0.0	31.0	0.0	51.7	43.3	22.0	78.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h				466	0	712	0	817	1096	331	1243	0
V/C Ratio(X)				1.15	0.00	1.85	0.00	1.75	0.77	2.06	1.11	0.00
Avail Cap(c_a), veh/h				466	0	712	0	817	1096	331	1243	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				44.6	0.0	33.7	0.0	34.3	12.6	49.2	20.8	0.0
Incr Delay (d2), s/veh				88.8	0.0	387.7	0.0	344.8	3.6	489.1	59.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				26.9	0.0	100.2	0.0	105.2	19.8	55.9	61.3	0.0
LnGrp Delay(d),s/veh				133.4	0.0	421.4	0.0	379.1	16.2	538.3	80.3	0.0
LnGrp LOS				F		F		F	B	F	F	
Approach Vol, veh/h					1851			2279			2057	
Approach Delay, s/veh					338.2			244.4			232.4	
Approach LOS					F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	27.0	57.0				84.0		36.3
Change Period (Y+Rc), s	5.0	5.3				* 5.3		5.3
Max Green Setting (Gmax), s	22.0	51.4				* 79		31.0
Max Q Clear Time (g_c+I1), s	24.0	53.7				80.7		33.0
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0

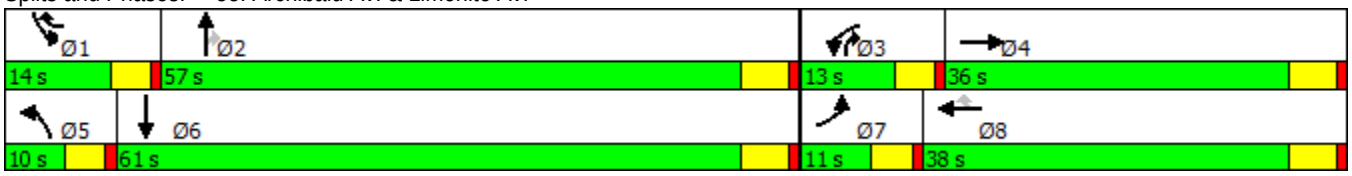
Intersection Summary	
HCM 2010 Ctrl Delay	268.4
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	230	620	329	711	824	120	1376	404	448	1319
Future Volume (vph)	230	620	329	711	824	120	1376	404	448	1319
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4	3	8	1	5	2	3	1	6
Permitted Phases					8			2		
Detector Phase	7	4	3	8	1	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0
Minimum Split (s)	9.6	33.3	9.6	33.3	9.6	9.6	46.3	9.6	9.6	46.3
Total Split (s)	11.0	36.0	13.0	38.0	14.0	10.0	57.0	13.0	14.0	61.0
Total Split (%)	9.2%	30.0%	10.8%	31.7%	11.7%	8.3%	47.5%	10.8%	11.7%	50.8%
Yellow Time (s)	3.6	4.3	3.6	4.3	3.6	3.6	4.3	3.6	3.6	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.3	4.6	5.3	4.6	4.6	5.3	4.6	4.6	5.3
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	620	92	329	711	824	120	1376	404	448	1319	223
Future Volume (veh/h)	230	620	92	329	711	824	120	1376	404	448	1319	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	250	674	100	343	773	793	130	1433	421	467	1374	242
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	414	61	127	518	567	81	819	800	142	731	129
Arrive On Green	0.05	0.26	0.26	0.07	0.27	0.27	0.05	0.43	0.43	0.08	0.46	0.46
Sat Flow, veh/h	1810	1618	240	1810	1900	1615	1810	1900	1595	1810	1574	277
Grp Volume(v), veh/h	250	0	774	343	773	793	130	1433	421	467	0	1616
Grp Sat Flow(s),veh/h/ln	1810	0	1858	1810	1900	1615	1810	1900	1595	1810	0	1851
Q Serve(g_s), s	6.4	0.0	30.7	8.4	32.7	32.7	5.4	51.7	21.5	9.4	0.0	55.7
Cycle Q Clear(g_c), s	6.4	0.0	30.7	8.4	32.7	32.7	5.4	51.7	21.5	9.4	0.0	55.7
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	97	0	475	127	518	567	81	819	800	142	0	859
V/C Ratio(X)	2.59	0.00	1.63	2.71	1.49	1.40	1.60	1.75	0.53	3.29	0.00	1.88
Avail Cap(c_a), veh/h	97	0	475	127	518	567	81	819	800	142	0	859
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.8	0.0	44.7	55.8	43.6	39.0	57.3	34.2	20.3	55.3	0.0	32.2
Incr Delay (d2), s/veh	744.9	0.0	292.4	790.5	231.9	190.3	318.3	342.8	0.7	1050.5	0.0	400.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.2	0.0	54.3	32.0	50.5	48.7	9.9	105.0	9.6	46.0	0.0	124.1
LnGrp Delay(d),s/veh	801.7	0.0	337.0	846.3	275.6	229.3	375.6	377.0	21.1	1105.8	0.0	432.9
LnGrp LOS	F		F	F	F	F	F	F	C	F		F
Approach Vol, veh/h		1024			1909			1984			2083	
Approach Delay, s/veh		450.5			358.9			301.4			583.8	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	57.0	13.0	36.0	10.0	61.0	11.0	38.0
Change Period (Y+Rc), s	4.6	5.3	4.6	5.3	4.6	5.3	4.6	5.3
Max Green Setting (Gmax), s	9.4	51.7	8.4	30.7	5.4	55.7	6.4	32.7
Max Q Clear Time (g_c+I1), s	11.4	53.7	10.4	32.7	7.4	57.7	8.4	34.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	422.9
HCM 2010 LOS	F

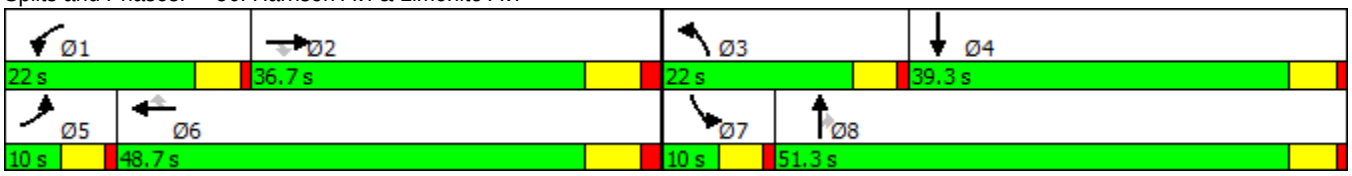
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	71	1640	57	38	1585	82	119	57	144	164	30
Future Volume (vph)	71	1640	57	38	1585	82	119	57	144	164	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	10.0	36.7	36.7	22.0	48.7	48.7	22.0	51.3	51.3	10.0	39.3
Total Split (%)	8.3%	30.6%	30.6%	18.3%	40.6%	40.6%	18.3%	42.8%	42.8%	8.3%	32.8%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 92.3
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	1640	57	38	1585	82	119	57	144	164	30	136
Future Volume (veh/h)	71	1640	57	38	1585	82	119	57	144	164	30	136
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	77	1783	60	41	1723	89	129	62	123	178	33	127
Adj No. of Lanes	1	3	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	99	2520	785	65	1685	738	161	329	279	101	47	181
Arrive On Green	0.05	0.49	0.49	0.04	0.47	0.47	0.09	0.17	0.17	0.06	0.14	0.14
Sat Flow, veh/h	1810	5187	1615	1810	3610	1581	1810	1900	1612	1810	336	1291
Grp Volume(v), veh/h	77	1783	60	41	1723	89	129	62	123	178	0	160
Grp Sat Flow(s),veh/h/ln	1810	1729	1615	1810	1805	1581	1810	1900	1612	1810	0	1627
Q Serve(g_s), s	3.8	24.1	1.8	2.0	41.7	2.8	6.2	2.5	6.1	5.0	0.0	8.4
Cycle Q Clear(g_c), s	3.8	24.1	1.8	2.0	41.7	2.8	6.2	2.5	6.1	5.0	0.0	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	99	2520	785	65	1685	738	161	329	279	101	0	227
V/C Ratio(X)	0.78	0.71	0.08	0.63	1.02	0.12	0.80	0.19	0.44	1.76	0.00	0.70
Avail Cap(c_a), veh/h	101	2520	785	344	1685	738	344	978	830	101	0	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.7	18.0	12.3	42.5	23.8	13.5	39.9	31.6	33.1	42.2	0.0	36.7
Incr Delay (d2), s/veh	27.5	0.9	0.0	3.8	27.9	0.1	3.4	0.3	1.1	378.3	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	11.6	0.8	1.1	27.1	1.2	3.3	1.3	2.8	13.1	0.0	4.0
LnGrp Delay(d),s/veh	69.2	18.9	12.3	46.3	51.7	13.5	43.3	31.9	34.2	420.5	0.0	40.6
LnGrp LOS	E	B	B	D	F	B	D	C	C	F		D
Approach Vol, veh/h		1920			1853			314			338	
Approach Delay, s/veh		20.7			49.8			37.5			240.7	
Approach LOS		C			D			D			F	

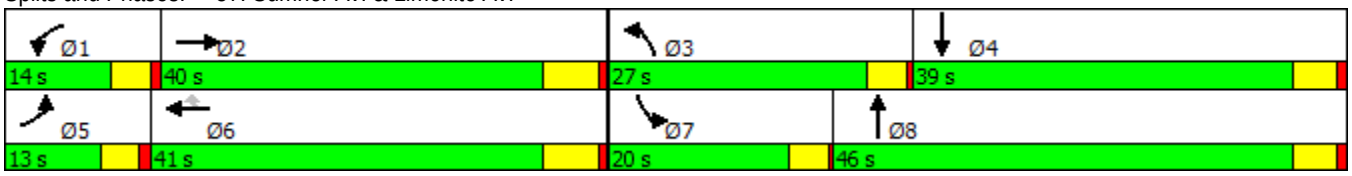
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	50.4	13.0	17.8	9.9	48.7	10.0	20.8
Change Period (Y+Rc), s	5.0	7.0	5.0	5.3	5.0	7.0	5.0	5.3
Max Green Setting (Gmax), s	17.0	29.7	17.0	34.0	5.0	41.7	5.0	46.0
Max Q Clear Time (g_c+I1), s	4.0	26.1	8.2	10.4	5.8	43.7	7.0	8.1
Green Ext Time (p_c), s	0.0	3.6	0.1	1.6	0.0	0.0	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	50.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	100	1642	165	1322	22	388	212	126	140
Future Volume (vph)	100	1642	165	1322	22	388	212	126	140
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	1	6		3	8	7	4
Permitted Phases					6				
Detector Phase	5	2	1	6	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	13.0	40.0	14.0	41.0	41.0	27.0	46.0	20.0	39.0
Total Split (%)	10.8%	33.3%	11.7%	34.2%	34.2%	22.5%	38.3%	16.7%	32.5%
Yellow Time (s)	3.5	5.0	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 98.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	1642	295	165	1322	22	388	212	276	126	140	96
Future Volume (veh/h)	100	1642	295	165	1322	22	388	212	276	126	140	96
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	108	1766	309	177	1422	18	417	228	223	135	151	76
Adj No. of Lanes	2	3	0	2	3	1	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	171	1600	277	247	1977	616	440	491	433	167	285	136
Arrive On Green	0.05	0.36	0.36	0.07	0.38	0.38	0.24	0.27	0.27	0.09	0.12	0.12
Sat Flow, veh/h	3510	4451	771	3510	5187	1615	1810	1805	1591	1810	2359	1126
Grp Volume(v), veh/h	108	1368	707	177	1422	18	417	228	223	135	114	113
Grp Sat Flow(s),veh/h/ln	1755	1729	1764	1755	1729	1615	1810	1805	1591	1810	1805	1680
Q Serve(g_s), s	2.9	34.0	34.0	4.7	22.1	0.7	21.4	10.0	11.2	6.9	5.6	6.0
Cycle Q Clear(g_c), s	2.9	34.0	34.0	4.7	22.1	0.7	21.4	10.0	11.2	6.9	5.6	6.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	171	1243	634	247	1977	616	440	491	433	167	218	203
V/C Ratio(X)	0.63	1.10	1.11	0.72	0.72	0.03	0.95	0.46	0.52	0.81	0.52	0.56
Avail Cap(c_a), veh/h	315	1243	634	353	1977	616	440	782	690	306	649	604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	30.3	30.3	43.0	24.9	18.3	35.2	28.7	29.2	42.1	39.0	39.2
Incr Delay (d2), s/veh	1.4	57.7	71.6	1.5	1.3	0.0	29.6	0.5	0.7	3.5	1.4	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	26.0	29.0	2.3	10.8	0.3	14.3	5.0	5.0	3.6	2.9	2.9
LnGrp Delay(d),s/veh	45.6	88.0	101.9	44.6	26.2	18.3	64.9	29.2	29.9	45.6	40.4	41.0
LnGrp LOS	D	F	F	D	C	B	E	C	C	D	D	D
Approach Vol, veh/h		2183			1617			868			362	
Approach Delay, s/veh		90.4			28.2			46.5			42.6	
Approach LOS		F			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	40.0	27.0	16.4	9.1	42.1	12.7	30.7
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	9.5	34.0	23.0	34.0	8.5	35.0	16.0	41.0
Max Q Clear Time (g_c+I1), s	6.7	36.0	23.4	8.0	4.9	24.1	8.9	13.2
Green Ext Time (p_c), s	0.1	0.0	0.0	3.1	0.0	10.4	0.1	3.1

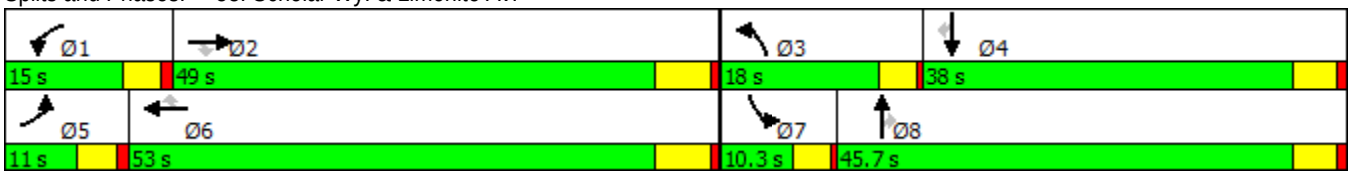
Intersection Summary	
HCM 2010 Ctrl Delay	59.4
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1735	88	90	1335	21	125	147	218	39	194	58
Future Volume (vph)	45	1735	88	90	1335	21	125	147	218	39	194	58
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	11.0	49.0	49.0	15.0	53.0	53.0	18.0	45.7	45.7	10.3	38.0	38.0
Total Split (%)	9.2%	40.8%	40.8%	12.5%	44.2%	44.2%	15.0%	38.1%	38.1%	8.6%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 96.9
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1735	88	90	1335	21	125	147	218	39	194	58
Future Volume (veh/h)	45	1735	88	90	1335	21	125	147	218	39	194	58
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	1886	87	98	1451	23	136	160	197	42	211	61
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	1774	794	125	1899	850	169	355	301	53	444	187
Arrive On Green	0.03	0.49	0.49	0.07	0.53	0.53	0.09	0.19	0.19	0.03	0.12	0.12
Sat Flow, veh/h	1810	3610	1615	1810	3610	1615	1810	1900	1612	1810	3610	1525
Grp Volume(v), veh/h	49	1886	87	98	1451	23	136	160	197	42	211	61
Grp Sat Flow(s),veh/h/ln	1810	1805	1615	1810	1805	1615	1810	1900	1612	1810	1805	1525
Q Serve(g_s), s	2.4	43.0	2.5	4.7	27.9	0.6	6.4	6.5	9.9	2.0	4.8	3.2
Cycle Q Clear(g_c), s	2.4	43.0	2.5	4.7	27.9	0.6	6.4	6.5	9.9	2.0	4.8	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	63	1774	794	125	1899	850	169	355	301	53	444	187
V/C Ratio(X)	0.78	1.06	0.11	0.78	0.76	0.03	0.80	0.45	0.65	0.79	0.48	0.33
Avail Cap(c_a), veh/h	134	1774	794	217	1939	868	290	884	750	130	1362	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	22.2	12.0	40.1	16.4	10.0	38.9	31.6	32.9	42.2	35.7	35.1
Incr Delay (d2), s/veh	7.6	40.4	0.1	3.9	1.8	0.0	3.4	0.7	1.8	9.3	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	31.1	1.1	2.5	14.2	0.3	3.4	3.5	4.5	1.1	2.4	1.4
LnGrp Delay(d),s/veh	49.5	62.6	12.0	44.0	18.2	10.0	42.2	32.2	34.7	51.4	36.3	35.8
LnGrp LOS	D	F	B	D	B	A	D	C	C	D	D	D
Approach Vol, veh/h		2022			1572			493			314	
Approach Delay, s/veh		60.1			19.7			36.0			38.3	
Approach LOS		E			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	49.0	12.2	15.7	7.5	52.0	6.6	21.4
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	10.5	43.0	14.0	33.0	6.5	47.0	6.3	40.7
Max Q Clear Time (g_c+I1), s	6.7	45.0	8.4	6.8	4.4	29.9	4.0	11.9
Green Ext Time (p_c), s	0.0	0.0	0.0	2.3	0.0	16.1	0.0	2.3

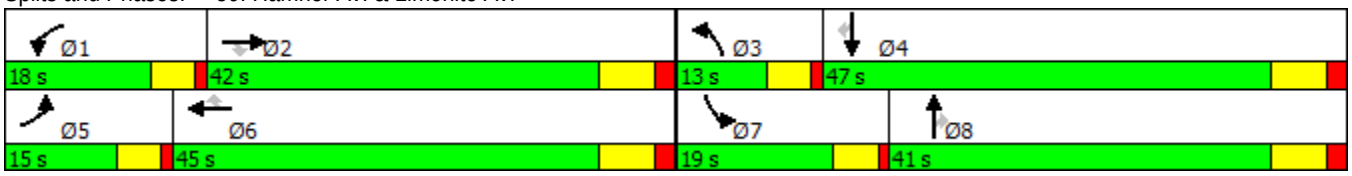
Intersection Summary	
HCM 2010 Ctrl Delay	41.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	317	1381	101	162	912	506	126	657	317	660	437	262
Future Volume (vph)	317	1381	101	162	912	506	126	657	317	660	437	262
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0
Total Split (s)	15.0	42.0	42.0	18.0	45.0	45.0	13.0	41.0	41.0	19.0	47.0	47.0
Total Split (%)	12.5%	35.0%	35.0%	15.0%	37.5%	37.5%	10.8%	34.2%	34.2%	15.8%	39.2%	39.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 113.2
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	1381	101	162	912	506	126	657	317	660	437	262
Future Volume (veh/h)	317	1381	101	162	912	506	126	657	317	660	437	262
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	327	1424	98	167	940	484	130	677	209	680	451	217
Adj No. of Lanes	2	3	1	2	2	1	2	3	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	310	1793	557	227	1162	519	187	1316	402	434	1170	522
Arrive On Green	0.09	0.35	0.35	0.06	0.32	0.32	0.05	0.25	0.25	0.12	0.32	0.32
Sat Flow, veh/h	3510	5187	1612	3510	3610	1610	3510	5187	1585	3510	3610	1611
Grp Volume(v), veh/h	327	1424	98	167	940	484	130	677	209	680	451	217
Grp Sat Flow(s),veh/h/ln	1755	1729	1612	1755	1805	1610	1755	1729	1585	1755	1805	1611
Q Serve(g_s), s	10.0	28.0	4.8	5.3	27.0	33.0	4.1	12.7	12.8	14.0	10.9	11.9
Cycle Q Clear(g_c), s	10.0	28.0	4.8	5.3	27.0	33.0	4.1	12.7	12.8	14.0	10.9	11.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	310	1793	557	227	1162	519	187	1316	402	434	1170	522
V/C Ratio(X)	1.05	0.79	0.18	0.73	0.81	0.93	0.69	0.51	0.52	1.57	0.39	0.42
Avail Cap(c_a), veh/h	310	1793	557	403	1212	541	248	1559	476	434	1276	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	33.4	25.8	52.0	35.2	37.2	52.6	36.2	36.3	49.6	29.5	29.9
Incr Delay (d2), s/veh	66.0	2.9	0.3	1.7	4.7	24.0	2.6	0.7	2.2	265.5	0.4	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	13.8	2.2	2.6	14.2	18.1	2.1	6.2	5.8	22.8	5.5	5.4
LnGrp Delay(d),s/veh	117.6	36.3	26.1	53.7	39.9	61.1	55.3	36.9	38.5	315.1	30.0	31.0
LnGrp LOS	F	D	C	D	D	E	E	D	D	F	C	C
Approach Vol, veh/h		1849			1591			1016			1348	
Approach Delay, s/veh		50.2			47.8			39.6			174.0	
Approach LOS		D			D			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	46.1	11.0	43.7	15.0	43.4	19.0	35.7
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	13.0	35.0	8.0	40.0	10.0	38.0	14.0	34.0
Max Q Clear Time (g_c+I1), s	7.3	30.0	6.1	13.9	12.0	35.0	16.0	14.8
Green Ext Time (p_c), s	0.1	4.9	0.0	17.2	0.0	1.5	0.0	13.7

Intersection Summary	
HCM 2010 Ctrl Delay	76.4
HCM 2010 LOS	E

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1960	794	1057	1523	424	0	237
Future Volume (vph)	1960	794	1057	1523	424	0	237
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	36.5	23.5	23.5	23.5
Total Split (s)	52.5	52.5	34.0	86.5	23.5	23.5	23.5
Total Split (%)	47.7%	47.7%	30.9%	78.6%	21.4%	21.4%	21.4%
Yellow Time (s)	4.5	4.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	Min	Min	Min

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 59 (54%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1960	794	1057	1523	0	0	0	0	424	0	237
Future Volume (veh/h)	0	1960	794	1057	1523	0	0	0	0	424	0	237
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	2154	872	1162	1674	0				516	0	107
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1559	689	941	2675	0				576	0	257
Arrive On Green	0.00	0.43	0.43	0.18	0.50	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	3705	1595	3510	3705	0				3619	0	1615
Grp Volume(v), veh/h	0	2154	872	1162	1674	0				516	0	107
Grp Sat Flow(s),veh/h/ln	0	1805	1595	1755	1805	0				1810	0	1615
Q Serve(g_s), s	0.0	47.5	47.5	29.5	37.3	0.0				15.4	0.0	6.6
Cycle Q Clear(g_c), s	0.0	47.5	47.5	29.5	37.3	0.0				15.4	0.0	6.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1559	689	941	2675	0				576	0	257
V/C Ratio(X)	0.00	1.38	1.27	1.23	0.63	0.00				0.90	0.00	0.42
Avail Cap(c_a), veh/h	0	1559	689	941	2675	0				592	0	264
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.2	31.2	45.1	16.6	0.0				45.4	0.0	41.7
Incr Delay (d2), s/veh	0.0	172.2	120.9	106.3	0.1	0.0				15.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	60.9	44.0	28.2	18.6	0.0				8.9	0.0	3.0
LnGrp Delay(d),s/veh	0.0	203.4	152.2	151.4	16.7	0.0				60.8	0.0	42.1
LnGrp LOS		F	F	F	B					E		D
Approach Vol, veh/h		3026			2836						623	
Approach Delay, s/veh		188.7			71.9						57.6	
Approach LOS		F			E						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	34.0	53.0		23.0		87.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	29.5	47.0		18.0		81.0		
Max Q Clear Time (g_c+I1), s	31.5	49.5		17.4		39.3		
Green Ext Time (p_c), s	0.0	0.0		0.1		36.0		

Intersection Summary	
HCM 2010 Ctrl Delay	125.0
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	387	1997	1944	413	636	0	654
Future Volume (vph)	387	1997	1944	413	636	0	654
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	36.0	86.0	50.0	50.0	24.0	24.0	24.0
Total Split (%)	32.7%	78.2%	45.5%	45.5%	21.8%	21.8%	21.8%
Yellow Time (s)	4.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	387	1997	0	0	1944	413	636	0	654	0	0	0
Future Volume (veh/h)	387	1997	0	0	1944	413	636	0	654	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	430	2219	0	0	2160	399	858	0	324			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	523	2642	0	0	1956	863	609	0	272			
Arrive On Green	0.15	0.73	0.00	0.00	0.54	0.54	0.17	0.00	0.17			
Sat Flow, veh/h	3510	3705	0	0	3705	1594	3619	0	1615			
Grp Volume(v), veh/h	430	2219	0	0	2160	399	858	0	324			
Grp Sat Flow(s),veh/h/ln	1755	1805	0	0	1805	1594	1810	0	1615			
Q Serve(g_s), s	13.1	47.1	0.0	0.0	59.6	16.8	18.5	0.0	18.5			
Cycle Q Clear(g_c), s	13.1	47.1	0.0	0.0	59.6	16.8	18.5	0.0	18.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	523	2642	0	0	1956	863	609	0	272			
V/C Ratio(X)	0.82	0.84	0.00	0.00	1.10	0.46	1.41	0.00	1.19			
Avail Cap(c_a), veh/h	1005	2642	0	0	1956	863	609	0	272			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	45.4	10.3	0.0	0.0	25.2	15.4	45.8	0.0	45.8			
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	55.2	1.8	194.0	0.0	117.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.4	22.9	0.0	0.0	44.6	7.9	25.6	0.0	17.1			
LnGrp Delay(d),s/veh	45.7	10.6	0.0	0.0	80.4	17.2	239.8	0.0	162.9			
LnGrp LOS	D	B			F	B	F		F			
Approach Vol, veh/h		2649			2559			1182				
Approach Delay, s/veh		16.3			70.6			218.7				
Approach LOS		B			E			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		86.0			20.9	65.1		24.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		80.5			31.5	44.5		18.5
Max Q Clear Time (g_c+I1), s		49.1			15.1	61.6		20.5
Green Ext Time (p_c), s		29.1			1.3	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	75.5
HCM 2010 LOS	E

Notes

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1488	630	119	1231	573	308	686
Future Volume (vph)	1488	630	119	1231	573	308	686
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	24.5	10.0	10.0	10.0
Total Split (s)	25.0	25.0	10.0	35.0	25.0	25.0	25.0
Total Split (%)	41.7%	41.7%	16.7%	58.3%	41.7%	41.7%	41.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	0.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0	4.5	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	C-Max	Max	Max	Max
Act Effct Green (s)	20.5	20.5	5.0	30.5	20.0	20.0	20.0
Actuated g/C Ratio	0.34	0.34	0.08	0.51	0.33	0.33	0.33
v/c Ratio	0.70	0.91	0.88	0.71	0.85	0.79	1.17
Control Delay	19.2	31.8	70.4	10.5	36.2	30.5	113.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	31.8	70.4	10.5	36.2	30.5	113.7
LOS	B	C	E	B	D	C	F
Approach Delay	22.9			15.8		68.5	
Approach LOS	C			B		E	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 5 (8%), Referenced to phase 6:WBT, Start of Yellow	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 96.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: SR-71 SB On Ramp/SR-71 SB Off Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1488	630	119	1231	0	0	0	0	573	308	686
Future Volume (veh/h)	0	1488	630	119	1231	0	0	0	0	573	308	686
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0				1800	1900	1900
Adj Flow Rate, veh/h	0	1566	537	125	1296	0				464	519	0
Adj No. of Lanes	0	4	1	1	2	0				1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	2233	544	143	1835	0				571	633	538
Arrive On Green	0.00	0.34	0.34	0.17	1.00	0.00				0.33	0.33	0.00
Sat Flow, veh/h	0	6802	1591	1714	3705	0				1714	1900	1615
Grp Volume(v), veh/h	0	1566	537	125	1296	0				464	519	0
Grp Sat Flow(s),veh/h/ln	0	1634	1591	1714	1805	0				1714	1900	1615
Q Serve(g_s), s	0.0	12.4	20.1	4.3	0.0	0.0				14.8	15.0	0.0
Cycle Q Clear(g_c), s	0.0	12.4	20.1	4.3	0.0	0.0				14.8	15.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2233	544	143	1835	0				571	633	538
V/C Ratio(X)	0.00	0.70	0.99	0.87	0.71	0.00				0.81	0.82	0.00
Avail Cap(c_a), veh/h	0	2233	544	143	1835	0				571	633	538
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.51	0.51	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	17.1	19.6	24.7	0.0	0.0				18.3	18.3	0.0
Incr Delay (d2), s/veh	0.0	1.0	35.4	24.2	1.2	0.0				11.9	11.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.7	14.1	3.0	0.3	0.0				8.9	9.8	0.0
LnGrp Delay(d),s/veh	0.0	18.1	55.0	48.9	1.2	0.0				30.2	29.7	0.0
LnGrp LOS		B	E	D	A					C	C	
Approach Vol, veh/h		2103			1421						983	
Approach Delay, s/veh		27.5			5.4						29.9	
Approach LOS		C			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	10.0	25.0		25.0		35.0		
Change Period (Y+Rc), s	5.0	4.5		5.0		4.5		
Max Green Setting (Gmax), s	5.0	20.5		20.0		30.5		
Max Q Clear Time (g_c+I1), s	6.3	22.1		17.0		2.0		
Green Ext Time (p_c), s	0.0	0.0		1.2		25.0		

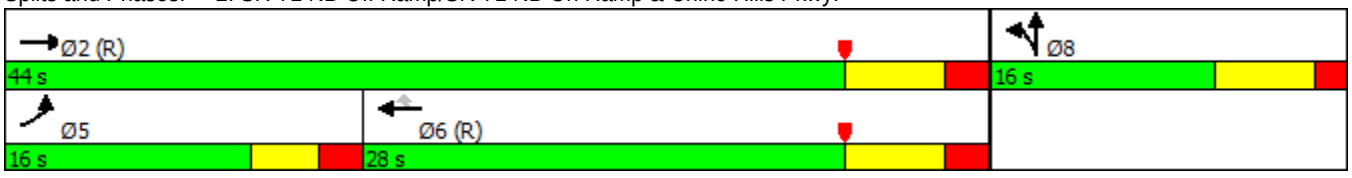
Intersection Summary	
HCM 2010 Ctrl Delay	21.1
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	561	1500	803	770	548	175
Future Volume (vph)	561	1500	803	770	548	175
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	16.0	44.0	28.0	28.0	16.0	16.0
Total Split (%)	26.7%	73.3%	46.7%	46.7%	26.7%	26.7%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	11.0	37.5	21.5	21.5	10.0	10.0
Actuated g/C Ratio	0.18	0.62	0.36	0.36	0.17	0.17
v/c Ratio	1.05	0.71	0.67	1.25	1.16	1.05
Control Delay	70.1	20.1	19.3	144.3	134.2	78.1
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	70.1	20.2	19.3	144.3	134.2	78.1
LOS	E	C	B	F	F	E
Approach Delay		33.8	80.5			96.8
Approach LOS		C	F			F

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 56 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.25	
Intersection Signal Delay: 62.0	Intersection LOS: E
Intersection Capacity Utilization 96.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	561	1500	0	0	803	770	548	175	114	0	0	0
Future Volume (veh/h)	561	1500	0	0	803	770	548	175	114	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1900	0	0	1900	1900	1800	1900	1900			
Adj Flow Rate, veh/h	603	1613	0	0	863	825	589	188	119			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	576	2256	0	0	1294	570	571	182	115			
Arrive On Green	0.18	0.63	0.00	0.00	0.36	0.36	0.17	0.17	0.17			
Sat Flow, veh/h	3141	3705	0	0	3705	1592	3429	1089	689			
Grp Volume(v), veh/h	603	1613	0	0	863	825	589	0	307			
Grp Sat Flow(s),veh/h/ln	1570	1805	0	0	1805	1592	1714	0	1778			
Q Serve(g_s), s	11.0	18.2	0.0	0.0	12.1	21.5	10.0	0.0	10.0			
Cycle Q Clear(g_c), s	11.0	18.2	0.0	0.0	12.1	21.5	10.0	0.0	10.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.39			
Lane Grp Cap(c), veh/h	576	2256	0	0	1294	570	571	0	296			
V/C Ratio(X)	1.05	0.71	0.00	0.00	0.67	1.45	1.03	0.00	1.04			
Avail Cap(c_a), veh/h	576	2256	0	0	1294	570	571	0	296			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.60	0.60	0.00	0.00	0.13	0.13	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.5	7.6	0.0	0.0	16.2	19.3	25.0	0.0	25.0			
Incr Delay (d2), s/veh	42.2	1.2	0.0	0.0	0.4	202.1	45.8	0.0	61.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.1	9.1	0.0	0.0	6.1	41.4	8.3	0.0	10.0			
LnGrp Delay(d),s/veh	66.7	8.8	0.0	0.0	16.6	221.3	70.8	0.0	86.9			
LnGrp LOS	F	A			B	F	F		F			
Approach Vol, veh/h		2216			1688			896				
Approach Delay, s/veh		24.6			116.7			76.3				
Approach LOS		C			F			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		44.0			16.0	28.0		16.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		37.5			11.0	21.5		10.0
Max Q Clear Time (g_c+I1), s		20.2			13.0	23.5		12.0
Green Ext Time (p_c), s		15.7			0.0	0.0		0.0

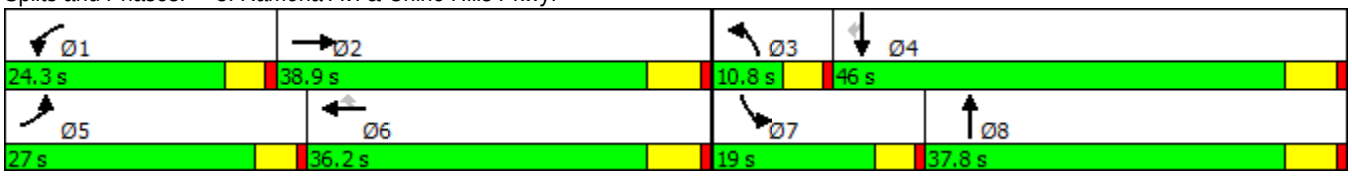
Intersection Summary	
HCM 2010 Ctrl Delay	66.6
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	329	1282	163	1010	164	29	468	207	435	534
Future Volume (vph)	329	1282	163	1010	164	29	468	207	435	534
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	27.0	38.9	24.3	36.2	36.2	10.8	37.8	19.0	46.0	46.0
Total Split (%)	22.5%	32.4%	20.3%	30.2%	30.2%	9.0%	31.5%	15.8%	38.3%	38.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	22.4	37.0	15.8	30.4	30.4	5.8	32.0	14.4	44.5	44.5
Actuated g/C Ratio	0.19	0.31	0.13	0.25	0.25	0.05	0.27	0.12	0.37	0.37
v/c Ratio	1.10	0.85	0.77	1.18	0.33	0.37	0.76	1.07	0.35	0.66
Control Delay	124.6	45.9	72.1	130.4	7.0	68.2	43.0	133.5	29.1	11.6
Queue Delay	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	124.6	52.2	72.1	130.4	7.0	68.2	43.0	133.5	29.1	11.6
LOS	F	D	E	F	A	E	D	F	C	B
Approach Delay		67.0		108.1			44.0		39.5	
Approach LOS		E		F			D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 68.3	Intersection LOS: E
Intersection Capacity Utilization 103.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	1282	3	163	1010	164	29	468	216	207	435	534
Future Volume (veh/h)	329	1282	3	163	1010	164	29	468	216	207	435	534
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	350	1364	3	173	1074	129	31	498	175	220	463	458
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	320	1730	4	199	915	404	46	697	243	206	1299	572
Arrive On Green	0.19	0.32	0.32	0.12	0.25	0.25	0.03	0.27	0.27	0.12	0.36	0.36
Sat Flow, veh/h	1714	5344	12	1714	3610	1593	1714	2614	913	1714	3610	1591
Grp Volume(v), veh/h	350	883	484	173	1074	129	31	343	330	220	463	458
Grp Sat Flow(s),veh/h/ln	1714	1729	1898	1714	1805	1593	1714	1805	1722	1714	1805	1591
Q Serve(g_s), s	22.4	27.8	27.8	11.9	30.4	7.9	2.2	20.6	20.9	14.4	11.3	31.1
Cycle Q Clear(g_c), s	22.4	27.8	27.8	11.9	30.4	7.9	2.2	20.6	20.9	14.4	11.3	31.1
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	320	1119	614	199	915	404	46	481	459	206	1299	572
V/C Ratio(X)	1.09	0.79	0.79	0.87	1.17	0.32	0.67	0.71	0.72	1.07	0.36	0.80
Avail Cap(c_a), veh/h	320	1119	614	281	915	404	89	481	459	206	1299	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.8	36.9	36.9	52.1	44.8	36.4	57.9	39.8	39.9	52.8	28.2	34.5
Incr Delay (d2), s/veh	77.8	4.1	7.2	13.9	90.0	0.6	6.2	8.7	9.3	82.4	0.8	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.5	13.9	15.8	6.4	26.5	3.5	1.1	11.4	11.1	11.5	5.8	15.4
LnGrp Delay(d),s/veh	126.6	40.9	44.0	66.0	134.8	37.0	64.1	48.5	49.3	135.2	29.0	45.7
LnGrp LOS	F	D	D	E	F	D	E	D	D	F	C	D
Approach Vol, veh/h		1717			1376			704			1141	
Approach Delay, s/veh		59.3			117.0			49.6			56.2	
Approach LOS		E			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.6	44.6	7.8	49.0	27.0	36.2	19.0	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	19.7	33.1	6.2	40.2	22.4	30.4	14.4	32.0
Max Q Clear Time (g_c+I1), s	13.9	29.8	4.2	33.1	24.4	32.4	16.4	22.9
Green Ext Time (p_c), s	0.1	3.2	0.0	4.5	0.0	0.0	0.0	5.4

Intersection Summary	
HCM 2010 Ctrl Delay	73.3
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	13

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1209	160	59	1153	166	45
Future Vol, veh/h	1209	160	59	1153	166	45
Conflicting Peds, #/hr	0	3	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	125	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1343	178	66	1281	184	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1346	0	2118	675
Stage 1	-	-	-	-	1346	-
Stage 2	-	-	-	-	772	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	518	-	~ 44	401
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	422	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	518	-	~ 38	400
Mov Cap-2 Maneuver	-	-	-	-	~ 175	-
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	368	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	169
HCM LOS			F

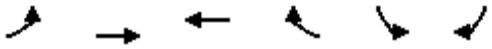
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	199	-	-	518	-
HCM Lane V/C Ratio	1.178	-	-	0.127	-
HCM Control Delay (s)	169	-	-	13	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	11.8	-	-	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	213	1041	903	107	310
Future Volume (vph)	213	1041	903	107	310
Turn Type	Prot	NA	NA	Prot	pm+ov
Protected Phases	5	2	6	4	5
Permitted Phases					4
Detector Phase	5	2	6	4	5
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	15.8	30.8	25.8	9.6
Total Split (s)	33.0	91.0	58.0	29.0	33.0
Total Split (%)	27.5%	75.8%	48.3%	24.2%	27.5%
Yellow Time (s)	3.6	4.8	4.8	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	5.8	4.6
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	None	None	Max	None
Act Effct Green (s)	18.6	67.0	43.7	23.7	43.5
Actuated g/C Ratio	0.18	0.65	0.43	0.23	0.42
v/c Ratio	0.75	0.48	0.80	0.16	0.48
Control Delay	56.3	9.3	29.9	36.2	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	9.3	29.9	36.2	18.6
LOS	E	A	C	D	B
Approach Delay		17.3	29.9	23.1	
Approach LOS		B	C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 102.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: Chino Hills Pkwy. & Monte Vista Av.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	213	1041	903	207	107	310
Future Volume (veh/h)	213	1041	903	207	107	310
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1900	1700	1900
Adj Flow Rate, veh/h	232	1132	982	223	116	151
Adj No. of Lanes	1	2	2	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	264	2406	1365	309	698	607
Arrive On Green	0.15	0.67	0.47	0.47	0.22	0.22
Sat Flow, veh/h	1714	3705	3007	660	3141	1615
Grp Volume(v), veh/h	232	1132	608	597	116	151
Grp Sat Flow(s),veh/h/ln	1714	1805	1805	1766	1570	1615
Q Serve(g_s), s	13.8	15.9	28.2	28.3	3.1	6.7
Cycle Q Clear(g_c), s	13.8	15.9	28.2	28.3	3.1	6.7
Prop In Lane	1.00			0.37	1.00	1.00
Lane Grp Cap(c), veh/h	264	2406	846	828	698	607
V/C Ratio(X)	0.88	0.47	0.72	0.72	0.17	0.25
Avail Cap(c_a), veh/h	466	2947	903	883	698	607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	8.5	22.2	22.3	32.8	22.4
Incr Delay (d2), s/veh	3.8	0.2	2.9	3.0	0.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	7.9	14.7	14.5	1.4	7.3
LnGrp Delay(d),s/veh	47.0	8.7	25.1	25.3	33.3	23.4
LnGrp LOS	D	A	C	C	C	C
Approach Vol, veh/h		1364	1205		267	
Approach Delay, s/veh		15.2	25.2		27.7	
Approach LOS		B	C		C	

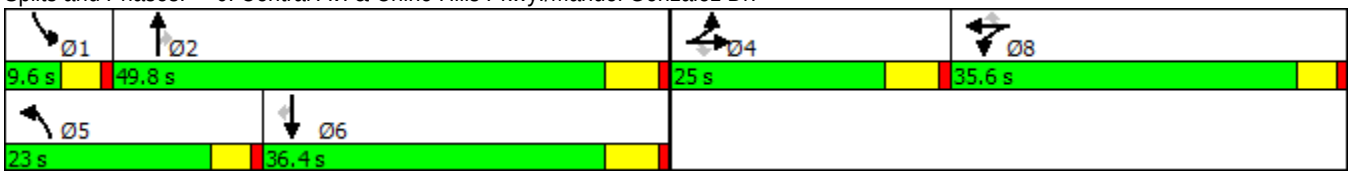
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		75.4		29.0	20.6	54.7		
Change Period (Y+Rc), s		5.8		5.8	4.6	5.8		
Max Green Setting (Gmax), s		85.2		23.2	28.4	52.2		
Max Q Clear Time (g_c+I1), s		17.9		8.7	15.8	30.3		
Green Ext Time (p_c), s		44.2		0.7	0.2	18.6		

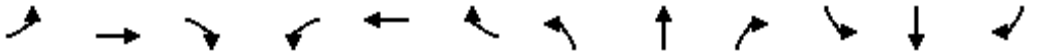
Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	634	2	535	13	48	38	444	1277	1	12	1084	250
Future Volume (vph)	634	2	535	13	48	38	444	1277	1	12	1084	250
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	15.8	35.6	35.6	35.6	9.6	30.8	30.8	9.6	30.8	30.8
Total Split (s)	25.0	25.0	25.0	35.6	35.6	35.6	23.0	49.8	49.8	9.6	36.4	36.4
Total Split (%)	20.8%	20.8%	20.8%	29.7%	29.7%	29.7%	19.2%	41.5%	41.5%	8.0%	30.3%	30.3%
Yellow Time (s)	4.8	4.8	4.8	3.6	3.6	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	4.6	4.6	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	19.4	19.4	19.4	13.6	13.6	13.6	18.6	52.7	52.7	5.1	31.0	31.0
Actuated g/C Ratio	0.19	0.19	0.19	0.14	0.14	0.14	0.19	0.53	0.53	0.05	0.31	0.31
v/c Ratio	1.10	1.04	0.74	0.06	0.20	0.12	1.52	0.73	0.00	0.15	1.06	0.46
Control Delay	119.0	102.4	10.2	37.7	40.5	0.7	282.3	24.2	0.0	54.3	78.5	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.0	102.4	10.2	37.7	40.5	0.7	282.3	24.2	0.0	54.3	78.5	16.6
LOS	F	F	B	D	D	A	F	C	A	D	E	B
Approach Delay		64.8			24.9			90.8			66.8	
Approach LOS		E			C			F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.52	
Intersection Signal Delay: 74.8	Intersection LOS: E
Intersection Capacity Utilization 94.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	634	2	535	13	48	38	444	1277	1	12	1084	250
Future Volume (veh/h)	634	2	535	13	48	38	444	1277	1	12	1084	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	690	0	454	14	52	24	483	1388	1	13	1178	202
Adj No. of Lanes	2	0	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	667	0	314	169	188	159	319	1736	776	26	1119	494
Arrive On Green	0.19	0.00	0.19	0.10	0.10	0.10	0.19	0.48	0.48	0.02	0.31	0.31
Sat Flow, veh/h	3429	0	1615	1714	1900	1605	1714	3610	1613	1714	3610	1593
Grp Volume(v), veh/h	690	0	454	14	52	24	483	1388	1	13	1178	202
Grp Sat Flow(s),veh/h/ln	1714	0	1615	1714	1900	1605	1714	1805	1613	1714	1805	1593
Q Serve(g_s), s	19.2	0.0	19.2	0.7	2.5	1.4	18.4	32.0	0.0	0.7	30.6	9.9
Cycle Q Clear(g_c), s	19.2	0.0	19.2	0.7	2.5	1.4	18.4	32.0	0.0	0.7	30.6	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	667	0	314	169	188	159	319	1736	776	26	1119	494
V/C Ratio(X)	1.04	0.00	1.45	0.08	0.28	0.15	1.51	0.80	0.00	0.50	1.05	0.41
Avail Cap(c_a), veh/h	667	0	314	538	596	504	319	1736	776	87	1119	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	0.0	39.8	40.4	41.2	40.7	40.2	21.6	13.3	48.3	34.1	26.9
Incr Delay (d2), s/veh	44.2	0.0	217.8	0.2	0.8	0.4	246.1	4.0	0.0	5.4	42.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.1	0.0	27.5	0.4	1.4	0.6	30.4	16.8	0.0	0.4	21.6	4.7
LnGrp Delay(d),s/veh	84.0	0.0	257.6	40.6	42.0	41.1	286.3	25.6	13.3	53.7	76.1	29.4
LnGrp LOS	F		F	D	D	D	F	C	B	D	F	C
Approach Vol, veh/h		1144			90			1872			1393	
Approach Delay, s/veh		152.9			41.6			92.8			69.1	
Approach LOS		F			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	53.3		25.0	23.0	36.4		14.4
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	44.0		19.2	18.4	30.6		31.0
Max Q Clear Time (g_c+I1), s	2.7	34.0		21.2	20.4	32.6		4.5
Green Ext Time (p_c), s	0.0	9.5		0.0	0.0	0.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	99.7
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	30	6	675	5	474	10	1022	618	415	1018
Future Volume (vph)	30	6	675	5	474	10	1022	618	415	1018
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	8	1	5	2		1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	28.8	9.6	28.8
Total Split (s)	15.2	15.2	33.8	33.8	11.0	11.0	60.0	60.0	11.0	60.0
Total Split (%)	12.7%	12.7%	28.2%	28.2%	9.2%	9.2%	50.0%	50.0%	9.2%	50.0%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	10.1	10.1	26.8	26.8	39.1	5.5	54.5	54.5	6.4	63.4
Actuated g/C Ratio	0.09	0.09	0.23	0.23	0.34	0.05	0.47	0.47	0.06	0.55
v/c Ratio	0.21	0.18	0.93	0.89	0.76	0.12	0.62	0.59	4.55	0.38
Control Delay	54.8	25.8	76.5	69.0	32.5	57.7	25.8	4.0	1637.5	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	25.8	76.5	69.0	32.5	57.7	25.8	4.0	1637.5	16.6
LOS	D	C	E	E	C	E	C	A	F	B
Approach Delay		40.6		56.2			17.8			479.4
Approach LOS		D		E			B			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 4.55	
Intersection Signal Delay: 183.7	Intersection LOS: F
Intersection Capacity Utilization 92.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	6	23	675	5	474	10	1022	618	415	1018	20
Future Volume (veh/h)	30	6	23	675	5	474	10	1022	618	415	1018	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	31	6	15	707	0	343	10	1065	468	432	1060	17
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	34	84	782	0	458	20	1687	745	95	2684	43
Arrive On Green	0.07	0.07	0.07	0.23	0.00	0.23	0.01	0.47	0.47	0.06	0.51	0.51
Sat Flow, veh/h	1714	482	1205	3429	0	1615	1714	3610	1594	1714	5257	84
Grp Volume(v), veh/h	31	0	21	707	0	343	10	1065	468	432	697	380
Grp Sat Flow(s),veh/h/ln	1714	0	1687	1714	0	1615	1714	1805	1594	1714	1729	1883
Q Serve(g_s), s	2.0	0.0	1.4	23.3	0.0	22.4	0.7	25.9	25.7	6.4	14.3	14.3
Cycle Q Clear(g_c), s	2.0	0.0	1.4	23.3	0.0	22.4	0.7	25.9	25.7	6.4	14.3	14.3
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	120	0	118	782	0	458	20	1687	745	95	1766	961
V/C Ratio(X)	0.26	0.00	0.18	0.90	0.00	0.75	0.49	0.63	0.63	4.57	0.39	0.40
Avail Cap(c_a), veh/h	157	0	154	828	0	479	95	1687	745	95	1766	961
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	0.0	50.8	43.5	0.0	37.8	57.0	23.3	23.3	54.8	17.4	17.4
Incr Delay (d2), s/veh	0.4	0.0	0.3	12.9	0.0	6.2	6.7	1.8	4.0	1629.2	0.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.6	12.4	0.0	10.8	0.4	13.3	12.1	45.8	6.9	7.7
LnGrp Delay(d),s/veh	51.5	0.0	51.0	56.4	0.0	44.0	63.6	25.2	27.3	1684.0	18.1	18.6
LnGrp LOS	D		D	E		D	E	C	C	F	B	B
Approach Vol, veh/h		52			1050			1543			1509	
Approach Delay, s/veh		51.3			52.3			26.1			495.1	
Approach LOS		D			D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	60.0		12.7	6.0	65.0		32.3
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	6.4	54.2		10.6	6.4	54.2		28.0
Max Q Clear Time (g_c+I1), s	8.4	27.9		4.0	2.7	16.3		25.3
Green Ext Time (p_c), s	0.0	22.3		0.0	0.0	30.2		1.2

Intersection Summary			
HCM 2010 Ctrl Delay		203.4	
HCM 2010 LOS		F	

Notes

Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	1237	958	202
Future Volume (vph)	1237	958	202
Turn Type	NA	NA	Prot
Protected Phases	2	6	8
Permitted Phases			
Detector Phase	2	6	8
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	23.5	9.5	10.0
Total Split (s)	78.0	78.0	42.0
Total Split (%)	65.0%	65.0%	35.0%
Yellow Time (s)	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	5.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	74.7	74.7	35.8
Actuated g/C Ratio	0.62	0.62	0.30
v/c Ratio	0.62	0.31	1.37dr
Control Delay	16.5	11.1	57.8
Queue Delay	0.0	0.0	0.0
Total Delay	16.5	11.1	57.8
LOS	B	B	E
Approach Delay	16.5	11.1	57.8
Approach LOS	B	B	E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 24.8	Intersection LOS: C
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: SR-71 NB Off Ramp & Central Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1237	607	0	958	202	661
Future Volume (veh/h)	1237	607	0	958	202	661
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	0	1900	1800	1900
Adj Flow Rate, veh/h	1302	639	0	1008	213	535
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2118	989	0	3177	529	498
Arrive On Green	1.00	1.00	0.00	0.61	0.31	0.31
Sat Flow, veh/h	3629	1615	0	5529	1714	1615
Grp Volume(v), veh/h	1302	639	0	1008	213	535
Grp Sat Flow(s),veh/h/ln	1729	1615	0	1729	1714	1615
Q Serve(g_s), s	0.0	0.0	0.0	11.2	11.8	37.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	11.2	11.8	37.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2118	989	0	3177	529	498
V/C Ratio(X)	0.61	0.65	0.00	0.32	0.40	1.07
Avail Cap(c_a), veh/h	2118	989	0	3177	529	498
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	11.2	32.8	41.5
Incr Delay (d2), s/veh	1.3	3.3	0.0	0.3	0.2	61.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.9	0.0	5.4	5.6	25.0
LnGrp Delay(d),s/veh	1.3	3.3	0.0	11.4	33.0	103.3
LnGrp LOS	A	A		B	C	F
Approach Vol, veh/h	1941			1008	748	
Approach Delay, s/veh	2.0			11.4	83.2	
Approach LOS	A			B	F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		78.0				78.0		42.0
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		73.5				73.5		37.0
Max Q Clear Time (g_c+I1), s		2.0				13.2		39.0
Green Ext Time (p_c), s		27.0				25.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

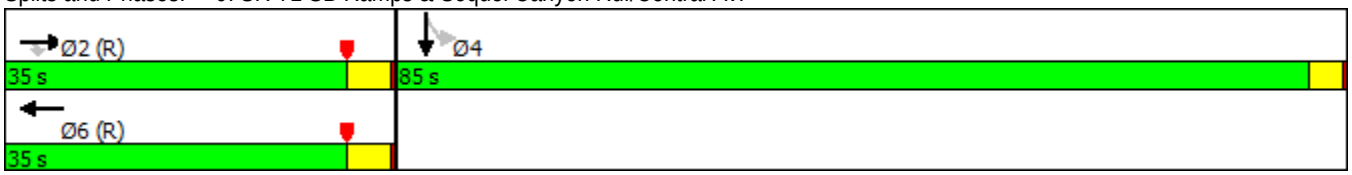
Notes

Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1353	113	576	491	0
Future Volume (vph)	1353	113	576	491	0
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	2		6		4
Permitted Phases		2		4	
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	25.5	8.5	8.5
Total Split (s)	35.0	35.0	35.0	85.0	85.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	70.8%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	3.5	3.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	30.5	30.5	30.5	81.5	81.5
Actuated g/C Ratio	0.25	0.25	0.25	0.68	0.68
v/c Ratio	1.04	0.24	1.04dr	0.40	1.00
Control Delay	78.7	10.1	39.4	9.8	46.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.7	10.1	39.4	9.8	46.6
LOS	E	B	D	A	D
Approach Delay	73.4		39.4		35.8
Approach LOS	E		D		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 50.2	Intersection LOS: D
Intersection Capacity Utilization 77.7%	ICU Level of Service D
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 9: SR-71 SB Ramps & Soquel Canyon Rd./Central Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑					↰	✣	
Traffic Volume (veh/h)	0	1353	113	0	576	584	0	0	0	491	0	1003
Future Volume (veh/h)	0	1353	113	0	576	584	0	0	0	491	0	1003
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900				1800	1900	1900
Adj Flow Rate, veh/h	0	1367	0	0	582	590				496	0	887
Adj No. of Lanes	0	3	1	0	3	0				1	1	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99				0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1855	578	0	1237	578				987	0	930
Arrive On Green	0.00	0.36	0.00	0.00	0.12	0.12				0.58	0.00	0.58
Sat Flow, veh/h	0	5358	1615	0	3629	1615				1714	0	1615
Grp Volume(v), veh/h	0	1367	0	0	582	590				496	0	887
Grp Sat Flow(s),veh/h/ln	0	1729	1615	0	1729	1615				1714	0	1615
Q Serve(g_s), s	0.0	27.6	0.0	0.0	18.9	42.9				20.7	0.0	62.0
Cycle Q Clear(g_c), s	0.0	27.6	0.0	0.0	18.9	42.9				20.7	0.0	62.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1855	578	0	1237	578				987	0	930
V/C Ratio(X)	0.00	0.74	0.00	0.00	0.47	1.02				0.50	0.00	0.95
Avail Cap(c_a), veh/h	0	1855	578	0	1237	578				1164	0	1097
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.6	0.0	0.0	42.3	52.9				15.2	0.0	24.0
Incr Delay (d2), s/veh	0.0	2.7	0.0	0.0	1.3	43.0				0.1	0.0	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.6	0.0	0.0	9.3	26.1				9.8	0.0	31.2
LnGrp Delay(d),s/veh	0.0	36.3	0.0	0.0	43.6	95.9				15.4	0.0	39.0
LnGrp LOS		D			D	F				B		D
Approach Vol, veh/h		1367			1172						1383	
Approach Delay, s/veh		36.3			69.9						30.5	
Approach LOS		D			E						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		47.4		72.6		47.4		
Change Period (Y+Rc), s		4.5		3.5		4.5		
Max Green Setting (Gmax), s		30.5		81.5		30.5		
Max Q Clear Time (g_c+I1), s		29.6		64.0		44.9		
Green Ext Time (p_c), s		0.8		5.0		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	44.3
HCM 2010 LOS	D

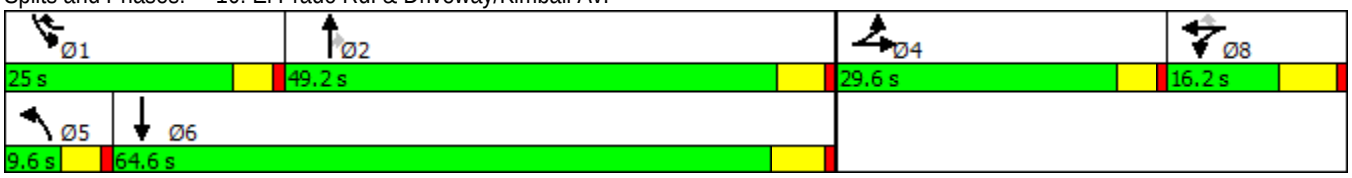
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	1	30	545	6	35	56	692	59
Future Volume (vph)	13	1	30	545	6	35	56	692	59
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	25.0	9.6	49.2	49.2	25.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	20.8%	8.0%	41.0%	41.0%	20.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.6	12.6	10.3	37.7	5.1	10.3	10.3	21.0	25.5
Actuated g/C Ratio	0.19	0.19	0.16	0.58	0.08	0.16	0.16	0.32	0.39
v/c Ratio	0.04	0.01	0.44	0.49	0.04	0.12	0.15	1.32	0.09
Control Delay	23.4	18.3	34.2	3.0	34.8	29.6	0.8	182.2	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	18.3	34.2	3.0	34.8	29.6	0.8	182.2	10.6
LOS	C	B	C	A	C	C	A	F	B
Approach Delay		22.5	8.7			13.3			159.0
Approach LOS		C	A			B			F

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 65.2
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 85.2 — Intersection LOS: F
Intersection Capacity Utilization 70.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	2	91	30	545	6	35	56	692	59	49
Future Volume (veh/h)	13	1	2	91	30	545	6	35	56	692	59	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	14	1	0	96	32	123	6	37	58	728	62	51
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	70	0	213	71	766	134	298	253	548	787	583
Arrive On Green	0.04	0.04	0.00	0.15	0.15	0.15	0.08	0.16	0.16	0.32	0.40	0.40
Sat Flow, veh/h	1714	1900	0	1373	458	1615	1714	1900	1615	1714	1976	1464
Grp Volume(v), veh/h	14	1	0	128	0	123	6	37	58	728	56	57
Grp Sat Flow(s),veh/h/ln	1714	1900	0	1831	0	1615	1714	1900	1615	1714	1805	1635
Q Serve(g_s), s	0.5	0.0	0.0	4.1	0.0	2.8	0.2	1.1	2.0	20.4	1.2	1.4
Cycle Q Clear(g_c), s	0.5	0.0	0.0	4.1	0.0	2.8	0.2	1.1	2.0	20.4	1.2	1.4
Prop In Lane	1.00		0.00	0.75		1.00	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	63	70	0	284	0	766	134	298	253	548	718	651
V/C Ratio(X)	0.22	0.01	0.00	0.45	0.00	0.16	0.04	0.12	0.23	1.33	0.08	0.09
Avail Cap(c_a), veh/h	672	744	0	287	0	769	134	1310	1113	548	1663	1507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	29.6	0.0	24.5	0.0	9.5	27.2	23.1	23.5	21.7	11.9	12.0
Incr Delay (d2), s/veh	1.8	0.1	0.0	1.1	0.0	0.1	0.1	0.2	0.5	160.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	2.1	0.0	1.2	0.1	0.6	0.9	33.8	0.6	0.6
LnGrp Delay(d),s/veh	31.6	29.7	0.0	25.6	0.0	9.6	27.3	23.3	24.0	181.8	12.0	12.0
LnGrp LOS	C	C		C		A	C	C	C	F	B	B
Approach Vol, veh/h		15			251			101			841	
Approach Delay, s/veh		31.5			17.8			23.9			159.0	
Approach LOS		C			B			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.0	15.8		6.9	9.6	31.2		16.1
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	20.4	* 44		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	22.4	4.0		2.5	2.2	3.4		6.1
Green Ext Time (p_c), s	0.0	1.0		0.0	0.0	1.0		0.3

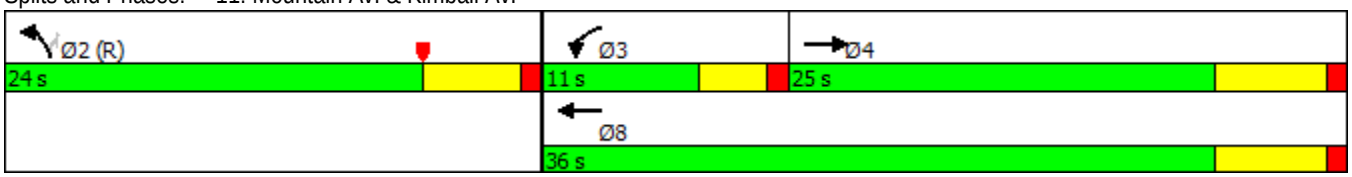
Intersection Summary	
HCM 2010 Ctrl Delay	116.8
HCM 2010 LOS	F

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1016	84	993	56	116
Future Volume (vph)	1016	84	993	56	116
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	4	3	8	2	
Permitted Phases					2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	22.0	11.0	16.0	23.3	23.3
Total Split (s)	25.0	11.0	36.0	24.0	24.0
Total Split (%)	41.7%	18.3%	60.0%	40.0%	40.0%
Yellow Time (s)	5.0	3.0	5.0	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	5.3	5.3
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	24.1	7.4	33.3	15.4	15.4
Actuated g/C Ratio	0.40	0.12	0.56	0.26	0.26
v/c Ratio	0.81	0.43	0.54	0.14	0.25
Control Delay	23.2	31.2	9.7	19.6	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	31.2	9.7	19.6	5.6
LOS	C	C	A	B	A
Approach Delay	23.2		11.4	10.2	
Approach LOS	C		B	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 19.7 (33%), Referenced to phase 2:NBL and 6:, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 11: Mountain Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1016	46	84	993	56	116
Future Volume (veh/h)	1016	46	84	993	56	116
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1116	49	92	1091	62	104
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1116	49	157	1714	577	544
Arrive On Green	0.32	0.32	0.09	0.47	0.34	0.34
Sat Flow, veh/h	3618	155	1714	3705	1714	1615
Grp Volume(v), veh/h	572	593	92	1091	62	104
Grp Sat Flow(s),veh/h/ln	1805	1873	1714	1805	1714	1615
Q Serve(g_s), s	19.0	19.0	3.1	13.6	1.5	2.7
Cycle Q Clear(g_c), s	19.0	19.0	3.1	13.6	1.5	2.7
Prop In Lane		0.08	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	572	593	157	1714	577	544
V/C Ratio(X)	1.00	1.00	0.59	0.64	0.11	0.19
Avail Cap(c_a), veh/h	572	593	200	1805	577	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.80	0.80	1.00	1.00
Uniform Delay (d), s/veh	20.5	20.5	26.2	11.9	13.7	14.1
Incr Delay (d2), s/veh	11.3	11.2	1.0	0.4	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	11.6	1.5	6.8	0.8	1.3
LnGrp Delay(d),s/veh	31.8	31.7	27.2	12.3	14.1	14.9
LnGrp LOS	F	F	C	B	B	B
Approach Vol, veh/h	1165			1183	166	
Approach Delay, s/veh	31.8			13.4	14.6	
Approach LOS	C			B	B	

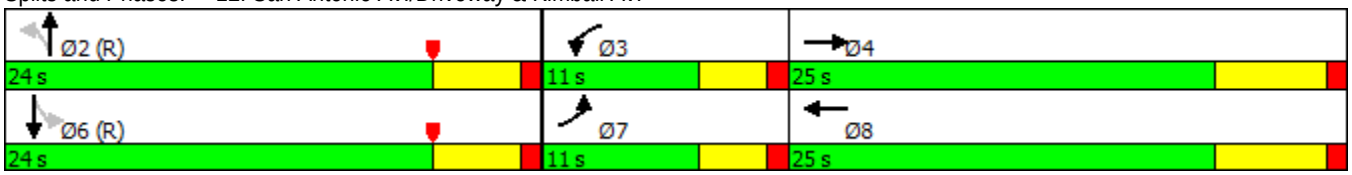
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		25.5	9.5	25.0				34.5
Change Period (Y+Rc), s		5.3	4.0	6.0				6.0
Max Green Setting (Gmax), s		18.7	7.0	19.0				30.0
Max Q Clear Time (g_c+I1), s		4.7	5.1	21.0				15.6
Green Ext Time (p_c), s		0.1	0.0	0.0				6.3

Intersection Summary	
HCM 2010 Ctrl Delay	22.0
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	1056	14	1022	77	0		
Future Volume (vph)	1056	14	1022	77	0		
Turn Type	NA	Prot	NA	Perm	NA		
Protected Phases	4	3	8		2	6	7
Permitted Phases				2			
Detector Phase	4	3	8	2	2		
Switch Phase							
Minimum Initial (s)	10.0	7.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.0	11.0	23.0	22.9	22.9	22.9	11.0
Total Split (s)	25.0	11.0	25.0	24.0	24.0	24.0	11.0
Total Split (%)	41.7%	18.3%	41.7%	40.0%	40.0%	40%	18%
Yellow Time (s)	5.0	3.0	5.0	3.9	3.9	3.9	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	4.0	6.0	4.9	4.9		
Lead/Lag	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes				Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	23.4	7.0	25.6	23.5	23.5		
Actuated g/C Ratio	0.39	0.12	0.43	0.39	0.39		
v/c Ratio	0.82	0.08	0.70	0.15	0.05		
Control Delay	20.5	24.6	16.6	14.2	0.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	20.5	24.6	16.6	14.2	0.1		
LOS	C	C	B	B	A		
Approach Delay	20.5		16.7		9.7		
Approach LOS	C		B		A		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 19.1 (32%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 45.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: San Antonio Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1056	36	14	1022	0	77	0	36	0	0	0
Future Volume (veh/h)	0	1056	36	14	1022	0	77	0	36	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	1112	38	15	1076	0	81	0	36	0	0	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	1128	39	44	1477	0	821	0	661	120	777	0
Arrive On Green	0.00	0.10	0.10	0.03	0.41	0.00	0.41	0.00	0.41	0.00	0.00	0.00
Sat Flow, veh/h	1714	3562	122	1714	3705	0	1714	0	1615	1394	1900	0
Grp Volume(v), veh/h	0	563	587	15	1076	0	81	0	36	0	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1879	1714	1805	0	1714	0	1615	1394	1900	0
Q Serve(g_s), s	0.0	18.7	18.7	0.5	15.1	0.0	1.8	0.0	0.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	18.7	18.7	0.5	15.1	0.0	1.8	0.0	0.8	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	3	572	595	44	1477	0	821	0	661	120	777	0
V/C Ratio(X)	0.00	0.99	0.99	0.34	0.73	0.00	0.10	0.00	0.05	0.00	0.00	0.00
Avail Cap(c_a), veh/h	200	572	595	200	1477	0	821	0	661	120	777	0
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.57	0.57	0.73	0.73	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	26.7	26.7	28.7	14.9	0.0	11.0	0.0	10.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	24.9	24.4	1.2	1.2	0.0	0.2	0.0	0.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.3	13.8	0.3	7.7	0.0	0.9	0.0	0.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	51.6	51.2	29.9	16.1	0.0	11.2	0.0	10.9	0.0	0.0	0.0
LnGrp LOS		D	D	C	B		B		B			
Approach Vol, veh/h		1150			1091			117			0	
Approach Delay, s/veh		51.4			16.3			11.1			0.0	
Approach LOS		D			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		29.5	5.5	25.0		29.5	0.0	30.5
Change Period (Y+Rc), s		4.9	4.0	6.0		4.9	4.0	6.0
Max Green Setting (Gmax), s		19.1	7.0	19.0		19.1	7.0	19.0
Max Q Clear Time (g_c+I1), s		3.8	2.5	20.7		0.0	0.0	17.1
Green Ext Time (p_c), s		0.1	0.0	0.0		0.0	0.0	1.4

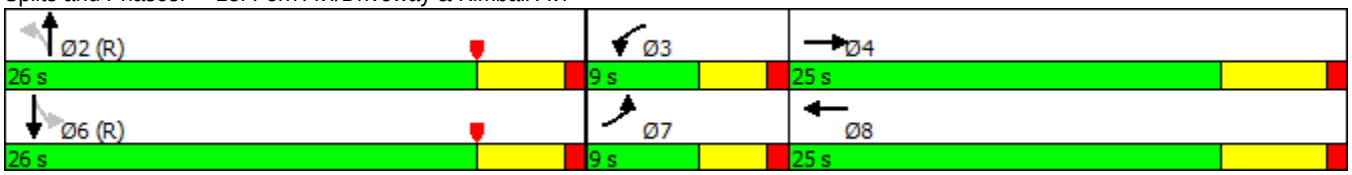
Intersection Summary	
HCM 2010 Ctrl Delay	33.2
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	20	1049	12	951	50	1	195	8
Future Volume (vph)	20	1049	12	951	50	1	195	8
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases					2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	22.7	9.0	22.7	24.9	24.9	24.9	24.9
Total Split (s)	9.0	25.0	9.0	25.0	26.0	26.0	26.0	26.0
Total Split (%)	15.0%	41.7%	15.0%	41.7%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.0	4.7	3.0	4.7	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.7	4.0	5.7	4.9	4.9	4.9	4.9
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	5.2	25.0	5.1	25.0	22.5	22.5	22.5	22.5
Actuated g/C Ratio	0.09	0.42	0.08	0.42	0.38	0.38	0.38	0.38
v/c Ratio	0.16	0.81	0.10	0.73	0.12	0.07	0.45	0.08
Control Delay	33.8	20.6	30.4	15.0	13.4	5.2	18.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	20.6	30.4	15.0	13.4	5.2	18.0	6.2
LOS	C	C	C	B	B	A	B	A
Approach Delay		20.8		15.2		9.7		15.8
Approach LOS		C		B		A		B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 21.1 (35%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 17.6 — Intersection LOS: B
Intersection Capacity Utilization 56.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 13: Fern Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1049	23	12	951	11	50	1	40	195	8	36
Future Volume (veh/h)	20	1049	23	12	951	11	50	1	40	195	8	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	23	1192	20	14	1081	12	57	1	25	222	9	23
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	45	1195	20	30	1170	13	678	26	641	684	195	497
Arrive On Green	0.04	0.44	0.44	0.02	0.32	0.32	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	1714	3632	61	1714	3656	41	1399	62	1562	1407	474	1212
Grp Volume(v), veh/h	23	592	620	14	534	559	57	0	26	222	0	32
Grp Sat Flow(s),veh/h/ln	1714	1805	1888	1714	1805	1892	1399	0	1624	1407	0	1686
Q Serve(g_s), s	0.8	19.6	19.7	0.5	17.1	17.1	1.5	0.0	0.6	6.7	0.0	0.7
Cycle Q Clear(g_c), s	0.8	19.6	19.7	0.5	17.1	17.1	2.2	0.0	0.6	7.3	0.0	0.7
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.96	1.00		0.72
Lane Grp Cap(c), veh/h	45	594	621	30	577	605	678	0	666	684	0	692
V/C Ratio(X)	0.51	1.00	1.00	0.47	0.92	0.92	0.08	0.00	0.04	0.32	0.00	0.05
Avail Cap(c_a), veh/h	143	594	621	143	581	609	678	0	666	684	0	692
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.47	0.47	0.47	0.09	0.09	0.09	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.6	16.8	16.8	29.2	19.7	19.7	11.3	0.0	10.6	12.8	0.0	10.6
Incr Delay (d2), s/veh	1.5	24.5	24.1	0.4	2.7	2.6	0.2	0.0	0.1	1.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	13.7	14.2	0.2	8.9	9.3	0.6	0.0	0.3	2.8	0.0	0.3
LnGrp Delay(d),s/veh	30.1	41.4	40.9	29.6	22.4	22.3	11.5	0.0	10.7	14.1	0.0	10.8
LnGrp LOS	C	D	D	C	C	C	B		B	B		B
Approach Vol, veh/h		1235			1107			83			254	
Approach Delay, s/veh		40.9			22.4			11.3			13.6	
Approach LOS		D			C			B			B	

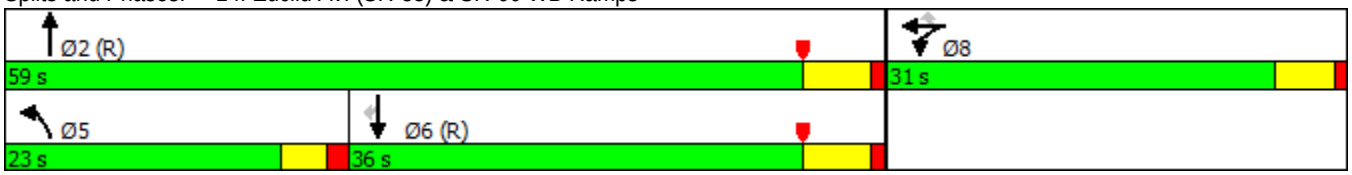
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		29.5	5.0	25.4		29.5	5.6	24.9
Change Period (Y+Rc), s		4.9	4.0	5.7		4.9	4.0	5.7
Max Green Setting (Gmax), s		21.1	5.0	19.3		21.1	5.0	19.3
Max Q Clear Time (g_c+I1), s		4.2	2.5	21.7		9.3	2.8	19.1
Green Ext Time (p_c), s		0.4	0.0	0.0		0.3	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	29.8
HCM 2010 LOS	C

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	757	8	601	410	1644	1351	807
Future Volume (vph)	757	8	601	410	1644	1351	807
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	31.0	31.0	31.0	23.0	59.0	36.0	36.0
Total Split (%)	34.4%	34.4%	34.4%	25.6%	65.6%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	26.0	26.0	26.0	18.5	53.5	30.5	30.5
Actuated g/C Ratio	0.29	0.29	0.29	0.21	0.59	0.34	0.34
v/c Ratio	1.05	1.04	0.92	1.23	0.81	1.16	0.89
Control Delay	89.5	84.0	50.9	134.8	28.6	112.0	20.7
Queue Delay	0.0	0.0	0.0	0.0	48.4	0.4	0.0
Total Delay	89.5	84.0	50.9	134.8	77.0	112.4	20.7
LOS	F	F	D	F	E	F	C
Approach Delay		75.4			88.6	78.1	
Approach LOS		E			F	E	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 81.3	Intersection LOS: F
Intersection Capacity Utilization 155.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	757	8	601	410	1644	0	0	1351	807
Future Volume (veh/h)	0	0	0	757	8	601	410	1644	0	0	1351	807
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1800	1900	1900	1800	1900	0	0	1900	1900
Adj Flow Rate, veh/h				949	0	322	432	1731	0	0	1422	849
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				990	0	461	352	2146	0	0	1223	529
Arrive On Green				0.29	0.00	0.29	0.27	0.79	0.00	0.00	0.34	0.34
Sat Flow, veh/h				3429	0	1594	1714	3705	0	0	3705	1561
Grp Volume(v), veh/h				949	0	322	432	1731	0	0	1422	849
Grp Sat Flow(s),veh/h/ln				1714	0	1594	1714	1805	0	0	1805	1561
Q Serve(g_s), s				24.5	0.0	16.2	18.5	24.9	0.0	0.0	30.5	30.5
Cycle Q Clear(g_c), s				24.5	0.0	16.2	18.5	24.9	0.0	0.0	30.5	30.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				990	0	461	352	2146	0	0	1223	529
V/C Ratio(X)				0.96	0.00	0.70	1.23	0.81	0.00	0.00	1.16	1.60
Avail Cap(c_a), veh/h				990	0	461	352	2146	0	0	1223	529
HCM Platoon Ratio				1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.5	0.0	28.5	32.7	6.4	0.0	0.0	29.8	29.8
Incr Delay (d2), s/veh				19.1	0.0	3.9	104.1	0.3	0.0	0.0	82.4	280.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.2	0.0	7.6	18.9	11.8	0.0	0.0	29.1	54.4
LnGrp Delay(d),s/veh				50.5	0.0	32.5	136.8	6.7	0.0	0.0	112.1	310.6
LnGrp LOS				D		C	F	A			F	F
Approach Vol, veh/h					1271			2163			2271	
Approach Delay, s/veh					46.0			32.7			186.4	
Approach LOS					D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		59.0			23.0	36.0		31.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.0
Max Green Setting (Gmax), s		53.5			18.5	30.5		26.0
Max Q Clear Time (g_c+I1), s		26.9			20.5	32.5		26.5
Green Ext Time (p_c), s		26.2			0.0	0.0		0.0

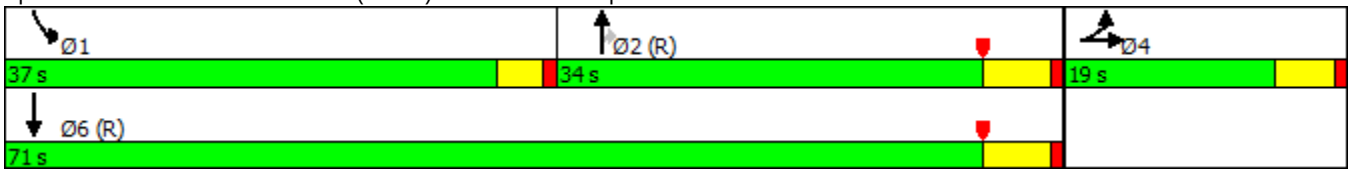
Intersection Summary	
HCM 2010 Ctrl Delay	96.8
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	592	2	1462	594	277	1831
Future Volume (vph)	592	2	1462	594	277	1831
Turn Type	Split	NA	NA	Perm	Prot	NA
Protected Phases	4	4	2		1	6
Permitted Phases				2		
Detector Phase	4	4	2	2	1	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	19.0	19.0	34.0	34.0	37.0	71.0
Total Split (%)	21.1%	21.1%	37.8%	37.8%	41.1%	78.9%
Yellow Time (s)	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	14.0	14.0	42.0	42.0	19.5	65.5
Actuated g/C Ratio	0.16	0.16	0.47	0.47	0.22	0.73
v/c Ratio	2.16	2.22	0.89	0.61	0.76	0.71
Control Delay	557.5	582.2	31.4	7.0	45.7	3.7
Queue Delay	31.4	23.6	1.6	0.0	0.0	1.9
Total Delay	588.9	605.9	33.1	7.0	45.7	5.6
LOS	F	F	C	A	D	A
Approach Delay		597.8	25.5			10.9
Approach LOS		F	C			B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.22	
Intersection Signal Delay: 140.8	Intersection LOS: F
Intersection Capacity Utilization 155.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	592	2	524	0	0	0	0	1462	594	277	1831	0
Future Volume (veh/h)	592	2	524	0	0	0	0	1462	594	277	1831	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900				0	1900	1900	1800	1900	0
Adj Flow Rate, veh/h	532	102	458				0	1492	606	283	1868	0
Adj No. of Lanes	1	1	0				0	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	267	47	211				0	1808	787	313	2627	0
Arrive On Green	0.16	0.16	0.16				0.00	0.50	0.50	0.36	1.00	0.00
Sat Flow, veh/h	1714	302	1358				0	3705	1571	1714	3705	0
Grp Volume(v), veh/h	532	0	560				0	1492	606	283	1868	0
Grp Sat Flow(s),veh/h/ln	1714	0	1660				0	1805	1571	1714	1805	0
Q Serve(g_s), s	14.0	0.0	14.0				0.0	31.6	28.2	14.1	0.0	0.0
Cycle Q Clear(g_c), s	14.0	0.0	14.0				0.0	31.6	28.2	14.1	0.0	0.0
Prop In Lane	1.00		0.82				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	267	0	258				0	1808	787	313	2627	0
V/C Ratio(X)	1.99	0.00	2.17				0.00	0.83	0.77	0.90	0.71	0.00
Avail Cap(c_a), veh/h	267	0	258				0	1808	787	629	2627	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.40	0.40	0.09	0.09	0.00
Uniform Delay (d), s/veh	38.0	0.0	38.0				0.0	19.1	18.2	27.8	0.0	0.0
Incr Delay (d2), s/veh	460.9	0.0	538.3				0.0	1.9	3.0	0.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	40.7	0.0	45.0				0.0	16.0	12.8	6.6	0.1	0.0
LnGrp Delay(d),s/veh	498.9	0.0	576.3				0.0	21.0	21.2	28.2	0.2	0.0
LnGrp LOS	F		F					C	C	C	A	
Approach Vol, veh/h		1092						2098			2151	
Approach Delay, s/veh		538.6						21.0			3.8	
Approach LOS		F						C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	20.4	50.6		19.0		71.0		
Change Period (Y+Rc), s	4.0	5.5		5.0		5.5		
Max Green Setting (Gmax), s	33.0	28.5		14.0		65.5		
Max Q Clear Time (g_c+I1), s	16.1	33.6		16.0		2.0		
Green Ext Time (p_c), s	0.3	0.0		0.0		61.5		

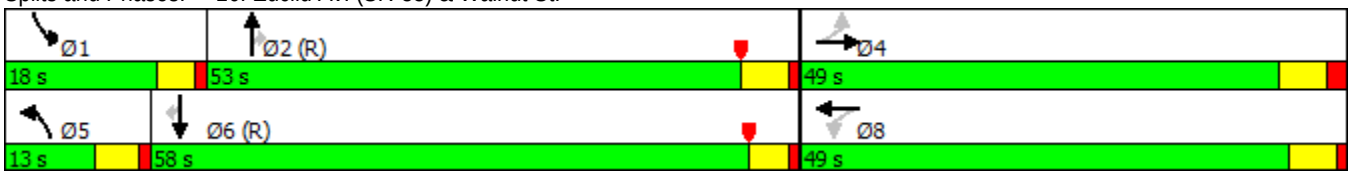
Intersection Summary		
HCM 2010 Ctrl Delay		119.9
HCM 2010 LOS		F

Notes

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	158	411	127	357	183	1684	91	417	1845	225
Future Volume (vph)	158	411	127	357	183	1684	91	417	1845	225
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		8	5	2		1	6	
Permitted Phases	4		8				2			6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	3.0	3.0
Minimum Split (s)	32.3	32.3	31.3	31.3	9.5	31.3	31.3	9.5	30.5	30.5
Total Split (s)	49.0	49.0	49.0	49.0	13.0	53.0	53.0	18.0	58.0	58.0
Total Split (%)	40.8%	40.8%	40.8%	40.8%	10.8%	44.2%	44.2%	15.0%	48.3%	48.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	3.9	4.3	4.3	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	5.3	5.3	4.9	5.3	5.3	4.5	4.5	4.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	35.2	35.2	36.2	36.2	16.9	48.2	48.2	20.5	52.2	52.2
Actuated g/C Ratio	0.29	0.29	0.30	0.30	0.14	0.40	0.40	0.17	0.44	0.44
v/c Ratio	0.98	0.60	0.92	0.50	0.80	0.84	0.13	0.81	0.85	0.29
Control Delay	104.4	33.4	94.9	30.6	74.9	9.6	0.2	62.1	34.8	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.4	33.4	94.9	30.6	74.9	9.6	0.2	62.1	34.8	5.3
LOS	F	C	F	C	E	A	A	E	C	A
Approach Delay		48.1		43.3		15.3			36.7	
Approach LOS		D		D		B			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.8 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 31.8	Intersection LOS: C
Intersection Capacity Utilization 90.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 16: Euclid Av. (SR-83) & Walnut St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	411	195	127	357	156	183	1684	91	417	1845	225
Future Volume (veh/h)	158	411	195	127	357	156	183	1684	91	417	1845	225
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	165	428	172	132	372	141	191	1754	72	434	1922	175
Adj No. of Lanes	1	2	0	1	2	0	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	264	855	340	229	874	326	116	2142	657	353	2358	732
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.14	0.83	0.83	0.11	0.45	0.45
Sat Flow, veh/h	899	2512	999	831	2567	959	1714	5187	1592	3141	5187	1611
Grp Volume(v), veh/h	165	306	294	132	260	253	191	1754	72	434	1922	175
Grp Sat Flow(s),veh/h/ln	899	1805	1706	831	1805	1721	1714	1729	1592	1570	1729	1611
Q Serve(g_s), s	20.9	16.2	16.5	18.0	13.3	13.7	8.1	21.8	1.0	13.5	38.5	8.0
Cycle Q Clear(g_c), s	34.5	16.2	16.5	34.5	13.3	13.7	8.1	21.8	1.0	13.5	38.5	8.0
Prop In Lane	1.00		0.59	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	614	581	229	614	586	116	2142	657	353	2358	732
V/C Ratio(X)	0.63	0.50	0.51	0.58	0.42	0.43	1.65	0.82	0.11	1.23	0.81	0.24
Avail Cap(c_a), veh/h	278	642	607	249	657	627	116	2142	657	353	2358	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.40	0.40	0.40
Uniform Delay (d), s/veh	44.0	31.4	31.5	45.3	30.5	30.6	51.9	8.0	6.2	53.3	28.3	20.0
Incr Delay (d2), s/veh	4.0	0.6	0.7	2.8	0.5	0.5	296.3	0.3	0.0	112.8	1.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	8.2	7.9	4.3	6.7	6.6	13.3	9.8	0.4	11.4	18.6	3.6
LnGrp Delay(d),s/veh	48.0	32.1	32.2	48.1	31.0	31.1	348.2	8.4	6.2	166.0	29.7	20.3
LnGrp LOS	D	C	C	D	C	C	F	A	A	F	C	C
Approach Vol, veh/h		765			645			2017			2531	
Approach Delay, s/veh		35.6			34.5			40.5			52.4	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	54.9		47.1	13.0	59.9		47.1
Change Period (Y+Rc), s	4.5	5.3		6.3	4.9	* 5.3		* 6.3
Max Green Setting (Gmax), s	13.5	47.7		42.7	8.1	* 54		* 44
Max Q Clear Time (g_c+I1), s	15.5	23.8		36.5	10.1	40.5		36.5
Green Ext Time (p_c), s	0.0	21.6		3.8	0.0	12.2		4.3

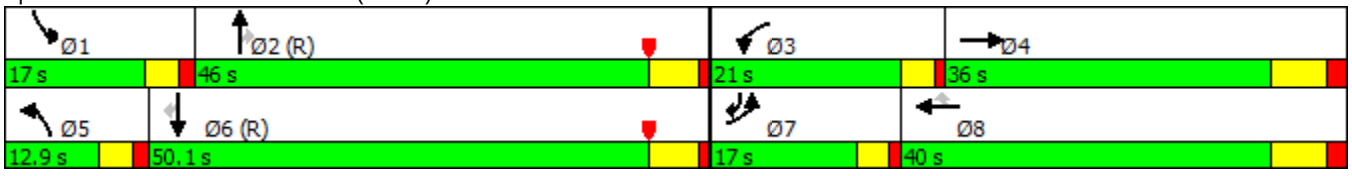
Intersection Summary			
HCM 2010 Ctrl Delay		44.3	
HCM 2010 LOS		D	

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	192	492	236	441	70	302	1713	615	166	1787	227
Future Volume (vph)	192	492	236	441	70	302	1713	615	166	1787	227
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	17.0	36.0	21.0	40.0	40.0	12.9	46.0	46.0	17.0	50.1	17.0
Total Split (%)	14.2%	30.0%	17.5%	33.3%	33.3%	10.8%	38.3%	38.3%	14.2%	41.8%	14.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	13.0	28.1	17.0	32.1	32.1	9.3	40.5	40.5	13.4	44.6	59.1
Actuated g/C Ratio	0.11	0.23	0.14	0.27	0.27	0.08	0.34	0.34	0.11	0.37	0.49
v/c Ratio	1.11	0.86	1.05	0.49	0.15	2.46	1.51	0.86	0.94	1.43	0.29
Control Delay	148.7	52.7	121.2	38.9	3.7	684.4	264.1	33.2	77.8	226.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.7	52.7	121.2	38.9	3.7	684.4	264.1	33.2	77.8	226.5	15.7
LOS	F	D	F	D	A	F	F	C	E	F	B
Approach Delay		74.0		61.6			258.4			193.2	
Approach LOS		E		E			F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.46	
Intersection Signal Delay: 188.6	Intersection LOS: F
Intersection Capacity Utilization 117.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	492	181	236	441	70	302	1713	615	166	1787	227
Future Volume (veh/h)	192	492	181	236	441	70	302	1713	615	166	1787	227
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	206	529	161	254	474	75	325	1842	530	178	1922	146
Adj No. of Lanes	1	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	186	628	190	243	951	419	120	1260	564	179	1383	785
Arrive On Green	0.11	0.23	0.23	0.14	0.26	0.26	0.02	0.12	0.12	0.07	0.26	0.26
Sat Flow, veh/h	1714	2731	828	1714	3610	1592	1714	3610	1615	1714	3610	1591
Grp Volume(v), veh/h	206	349	341	254	474	75	325	1842	530	178	1922	146
Grp Sat Flow(s),veh/h/ln	1714	1805	1754	1714	1805	1592	1714	1805	1615	1714	1805	1591
Q Serve(g_s), s	13.0	22.1	22.3	17.0	13.4	4.4	8.4	41.9	39.1	12.5	46.0	7.2
Cycle Q Clear(g_c), s	13.0	22.1	22.3	17.0	13.4	4.4	8.4	41.9	39.1	12.5	46.0	7.2
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	415	404	243	951	419	120	1260	564	179	1383	785
V/C Ratio(X)	1.11	0.84	0.85	1.05	0.50	0.18	2.71	1.46	0.94	1.00	1.39	0.19
Avail Cap(c_a), veh/h	186	436	424	243	993	438	120	1260	564	179	1383	785
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.40	0.40	0.40
Uniform Delay (d), s/veh	53.5	44.1	44.2	51.5	37.5	34.2	58.6	53.1	51.8	55.8	44.6	20.9
Incr Delay (d2), s/veh	98.3	13.8	14.7	70.3	0.6	0.3	770.9	208.2	3.9	41.8	177.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	12.6	12.5	12.8	6.7	2.0	29.7	57.4	18.1	8.0	56.9	3.2
LnGrp Delay(d),s/veh	151.8	57.9	58.9	121.8	38.1	34.4	829.5	261.3	55.8	97.6	221.6	21.1
LnGrp LOS	F	E	E	F	D	C	F	F	E	F	F	C
Approach Vol, veh/h		896			803			2697			2246	
Approach Delay, s/veh		79.9			64.2			289.4			198.7	
Approach LOS		E			E			F			F	

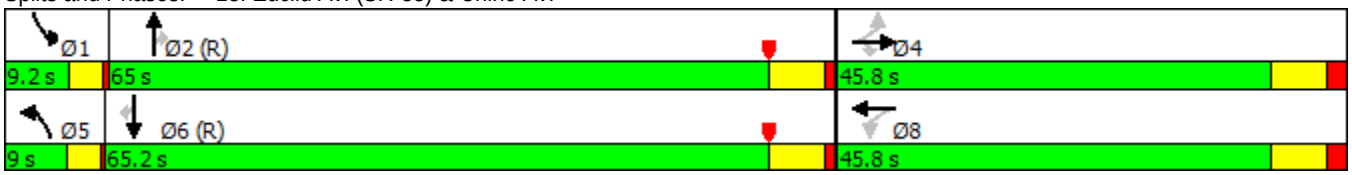
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	47.4	21.0	34.6	12.9	51.5	17.0	38.6
Change Period (Y+Rc), s	4.5	5.5	4.0	7.0	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	40.5	17.0	29.0	8.4	44.6	13.0	33.0
Max Q Clear Time (g_c+I1), s	14.5	43.9	19.0	24.3	10.4	48.0	15.0	15.4
Green Ext Time (p_c), s	0.0	0.0	0.0	3.3	0.0	0.0	0.0	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	203.2
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	89	222	61	165	202	84	2576	436	50	1945	115
Future Volume (vph)	89	222	61	165	202	84	2576	436	50	1945	115
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	45.8	45.8	45.8	45.8	45.8	9.0	65.0	65.0	9.2	65.2	65.2
Total Split (%)	38.2%	38.2%	38.2%	38.2%	38.2%	7.5%	54.2%	54.2%	7.7%	54.3%	54.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0		7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	38.8	38.8	38.8		38.8	5.5	60.8	60.8	5.6	59.2	59.2
Actuated g/C Ratio	0.32	0.32	0.32		0.32	0.05	0.51	0.51	0.05	0.49	0.49
v/c Ratio	0.36	0.37	0.11		1.10	1.12	1.45	0.53	0.66	1.13	0.15
Control Delay	36.2	33.4	7.5		112.1	118.2	231.0	17.2	88.2	74.8	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	33.4	7.5		112.1	118.2	231.0	17.2	88.2	74.8	0.1
LOS	D	C	A		F	F	F	B	F	E	A
Approach Delay		29.9			112.1		197.8			71.0	
Approach LOS		C			F		F			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20.2 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 136.7	Intersection LOS: F
Intersection Capacity Utilization 126.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	222	61	165	202	79	84	2576	436	50	1945	115
Future Volume (veh/h)	89	222	61	165	202	79	84	2576	436	50	1945	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	92	229	63	170	208	77	87	2656	393	52	2005	90
Adj No. of Lanes	1	1	1	0	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	279	614	522	171	171	61	79	1808	809	66	1781	780
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.06	0.67	0.67	0.08	0.99	0.99
Sat Flow, veh/h	1112	1900	1615	400	529	189	1714	3610	1615	1714	3610	1580
Grp Volume(v), veh/h	92	229	63	455	0	0	87	2656	393	52	2005	90
Grp Sat Flow(s),veh/h/ln	1112	1900	1615	1118	0	0	1714	1805	1615	1714	1805	1580
Q Serve(g_s), s	0.0	11.1	3.3	27.7	0.0	0.0	5.5	60.1	14.4	3.6	59.2	0.1
Cycle Q Clear(g_c), s	12.8	11.1	3.3	38.8	0.0	0.0	5.5	60.1	14.4	3.6	59.2	0.1
Prop In Lane	1.00		1.00	0.37		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	279	614	522	403	0	0	79	1808	809	66	1781	780
V/C Ratio(X)	0.33	0.37	0.12	1.13	0.00	0.00	1.11	1.47	0.49	0.79	1.13	0.12
Avail Cap(c_a), veh/h	279	614	522	403	0	0	79	1808	809	81	1781	780
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	31.8	31.2	28.6	46.6	0.0	0.0	56.3	20.0	12.4	54.9	0.8	0.4
Incr Delay (d2), s/veh	0.7	0.4	0.1	85.0	0.0	0.0	64.3	211.3	0.2	3.1	57.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	5.9	1.5	22.8	0.0	0.0	4.0	82.5	6.3	1.8	14.6	0.0
LnGrp Delay(d),s/veh	32.5	31.6	28.7	131.6	0.0	0.0	120.8	231.3	12.6	58.0	58.2	0.4
LnGrp LOS	C	C	C	F			F	F	B	E	F	A
Approach Vol, veh/h		384			455			3136			2147	
Approach Delay, s/veh		31.3			131.6			200.8			55.8	
Approach LOS		C			F			F			E	

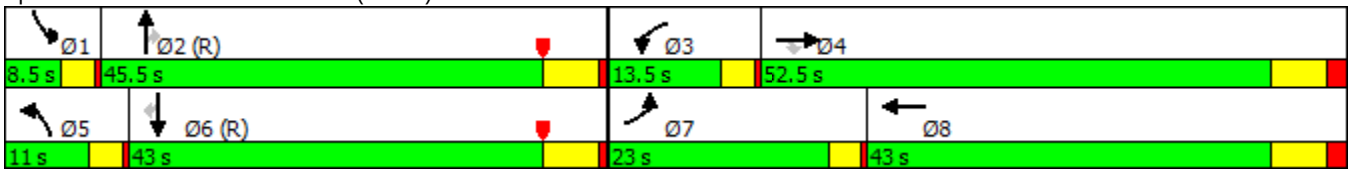
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	66.1		45.8	9.0	65.2		45.8
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.7	59.0		38.8	5.5	59.2		38.8
Max Q Clear Time (g_c+I1), s	5.6	62.1		14.8	7.5	61.2		40.8
Green Ext Time (p_c), s	0.0	0.0		4.9	0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	134.2
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	459	289	240	35	63	224	2566	77	122	2138	364
Future Volume (vph)	459	289	240	35	63	224	2566	77	122	2138	364
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	23.0	52.5	52.5	13.5	43.0	11.0	45.5	45.5	8.5	43.0	43.0
Total Split (%)	19.2%	43.8%	43.8%	11.3%	35.8%	9.2%	37.9%	37.9%	7.1%	35.8%	35.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.5	31.6	31.6	10.0	16.7	26.8	45.8	45.8	18.0	37.0	37.0
Actuated g/C Ratio	0.16	0.26	0.26	0.08	0.14	0.22	0.38	0.38	0.15	0.31	0.31
v/c Ratio	1.71	0.60	0.42	0.25	0.46	0.61	1.92	0.11	0.49	1.98	0.65
Control Delay	365.2	43.4	7.6	56.4	33.6	33.9	438.9	4.6	59.1	464.6	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	365.2	43.4	7.6	56.4	33.6	33.9	438.9	4.6	59.1	464.6	12.7
LOS	F	D	A	E	C	C	F	A	E	F	B
Approach Delay		184.2			38.5		395.6			383.0	
Approach LOS		F			D		F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 62.5 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.98	
Intersection Signal Delay: 350.5	Intersection LOS: F
Intersection Capacity Utilization 129.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	459	289	240	35	63	64	224	2566	77	122	2138	364
Future Volume (veh/h)	459	289	240	35	63	64	224	2566	77	122	2138	364
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	473	298	171	36	65	61	231	2645	70	126	2204	322
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	279	397	337	100	95	89	107	1893	847	71	1818	795
Arrive On Green	0.16	0.21	0.21	0.06	0.10	0.10	0.04	0.35	0.35	0.03	0.34	0.34
Sat Flow, veh/h	1714	1900	1615	1714	903	847	1714	3610	1615	1714	3610	1579
Grp Volume(v), veh/h	473	298	171	36	0	126	231	2645	70	126	2204	322
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	0	1750	1714	1805	1615	1714	1805	1579
Q Serve(g_s), s	19.5	17.7	11.2	2.4	0.0	8.3	7.5	62.9	3.5	5.0	60.4	18.8
Cycle Q Clear(g_c), s	19.5	17.7	11.2	2.4	0.0	8.3	7.5	62.9	3.5	5.0	60.4	18.8
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	279	397	337	100	0	183	107	1893	847	71	1818	795
V/C Ratio(X)	1.70	0.75	0.51	0.36	0.00	0.69	2.16	1.40	0.08	1.76	1.21	0.40
Avail Cap(c_a), veh/h	279	720	612	143	0	525	107	1893	847	71	1818	795
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	50.2	44.5	42.0	54.4	0.0	51.8	57.5	38.9	19.6	58.3	39.8	26.0
Incr Delay (d2), s/veh	329.1	2.1	0.9	0.8	0.0	3.4	523.0	178.9	0.0	349.0	96.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	34.7	9.5	5.1	1.2	0.0	4.2	19.1	78.4	1.6	9.3	54.4	8.2
LnGrp Delay(d),s/veh	379.3	46.7	42.9	55.2	0.0	55.2	580.5	217.8	19.6	407.3	135.7	26.1
LnGrp LOS	F	D	D	E		E	F	F	B	F	F	C
Approach Vol, veh/h		942			162			2946			2652	
Approach Delay, s/veh		213.0			55.2			241.6			135.3	
Approach LOS		F			E			F			F	

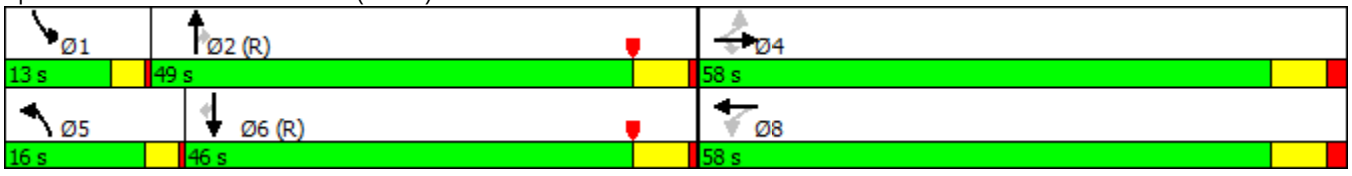
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	68.9	10.5	32.1	11.0	66.4	23.0	19.6
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	5.0	39.5	10.0	45.5	7.5	37.0	19.5	36.0
Max Q Clear Time (g_c+I1), s	7.0	64.9	4.4	19.7	9.5	62.4	21.5	10.3
Green Ext Time (p_c), s	0.0	0.0	0.0	2.2	0.0	0.0	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	191.0
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	465	1072	346	166	509	221	1976	230	536	1565	217
Future Volume (vph)	465	1072	346	166	509	221	1976	230	536	1565	217
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.0	46.0	46.0	49.0	49.0	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	58.0	58.0	58.0	58.0	58.0	16.0	49.0	49.0	13.0	46.0	46.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	48.3%	13.3%	40.8%	40.8%	10.8%	38.3%	38.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	51.0	51.0	51.0	51.0	51.0	12.5	43.0	43.0	9.5	40.0	40.0
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.10	0.36	0.36	0.08	0.33	0.33
v/c Ratio	8.03	1.36	0.45	2.86	1.33	1.27	1.56	0.38	4.05	1.33	0.36
Control Delay	3206.8	198.5	13.1	901.3	188.1	157.6	286.1	29.8	1391.3	167.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3206.8	198.5	13.1	901.3	188.1	157.6	286.1	29.8	1391.3	167.4	2.0
LOS	F	F	B	F	F	F	F	C	F	F	A
Approach Delay		906.7			288.1		250.1			435.0	
Approach LOS		F			F		F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 8.03	
Intersection Signal Delay: 469.0	Intersection LOS: F
Intersection Capacity Utilization 191.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	465	1072	346	166	509	507	221	1976	230	536	1565	217
Future Volume (veh/h)	465	1072	346	166	509	507	221	1976	230	536	1565	217
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	474	1094	261	169	519	512	226	2016	215	547	1597	194
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	60	808	677	60	374	369	179	1294	579	136	1203	538
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.03	0.12	0.12	0.16	0.67	0.67
Sat Flow, veh/h	556	1900	1593	409	879	868	1714	3610	1615	1714	3610	1615
Grp Volume(v), veh/h	474	1094	261	169	0	1031	226	2016	215	547	1597	194
Grp Sat Flow(s),veh/h/ln	556	1900	1593	409	0	1747	1714	1805	1615	1714	1805	1615
Q Serve(g_s), s	0.0	51.0	13.5	0.0	0.0	51.0	12.5	43.0	14.7	9.5	40.0	6.3
Cycle Q Clear(g_c), s	51.0	51.0	13.5	51.0	0.0	51.0	12.5	43.0	14.7	9.5	40.0	6.3
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	60	808	677	60	0	742	179	1294	579	136	1203	538
V/C Ratio(X)	7.90	1.35	0.39	2.82	0.00	1.39	1.27	1.56	0.37	4.03	1.33	0.36
Avail Cap(c_a), veh/h	60	808	677	60	0	742	179	1294	579	136	1203	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	60.0	34.5	23.7	60.0	0.0	34.5	57.9	52.9	40.4	50.5	20.0	14.4
Incr Delay (d2), s/veh	3139.0	167.8	0.4	861.6	0.0	183.2	123.7	251.7	0.2	1365.3	147.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	54.3	64.3	6.0	16.3	0.0	62.3	12.1	66.7	6.6	55.9	44.1	2.8
LnGrp Delay(d),s/veh	3199.0	202.3	24.1	921.6	0.0	217.7	181.6	304.6	40.6	1415.8	167.8	14.6
LnGrp LOS	F	F	C	F		F	F	F	D	F	F	B
Approach Vol, veh/h		1829			1200			2457			2338	
Approach Delay, s/veh		953.5			316.8			270.2			447.0	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	49.0		58.0	16.0	46.0		58.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	9.5	43.0		51.0	12.5	40.0		51.0
Max Q Clear Time (g_c+I1), s	11.5	45.0		53.0	14.5	42.0		53.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		489.9
HCM 2010 LOS		F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	107	42	256	61	20	181	2348	95	119	1916	68
Future Volume (vph)	107	42	256	61	20	181	2348	95	119	1916	68
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	46.8	46.8	46.8	46.8	46.8	8.5	30.7	30.7	8.5	37.7	37.7
Total Split (s)	46.8	46.8	46.8	46.8	46.8	16.5	64.7	64.7	8.5	56.7	56.7
Total Split (%)	39.0%	39.0%	39.0%	39.0%	39.0%	13.8%	53.9%	53.9%	7.1%	47.3%	47.3%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	3.0	4.7	4.7	3.0	4.7	4.7
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.8	3.5	5.7	5.7	3.5	5.7	5.7
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	20.1	20.1	20.1	20.1	20.1	20.4	67.0	67.0	18.9	65.5	65.5
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.17	0.56	0.56	0.16	0.55	0.55
v/c Ratio	0.64	0.14	0.67	0.30	0.34	0.68	1.27	0.11	0.48	1.06	0.08
Control Delay	59.8	38.5	24.1	43.2	13.9	64.3	142.1	0.4	59.5	43.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	38.5	24.1	43.2	13.9	64.3	142.1	0.4	59.5	43.3	0.1
LOS	E	D	C	D	B	E	F	A	E	D	A
Approach Delay		35.0			24.3		131.6			42.9	
Approach LOS		D			C		F			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 85.6	Intersection LOS: F
Intersection Capacity Utilization 96.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 21: Euclid Av. (SR-83) & Eucalyptus Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	42	256	61	20	90	181	2348	95	119	1916	68
Future Volume (veh/h)	107	42	256	61	20	90	181	2348	95	119	1916	68
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	116	46	173	66	22	96	197	2552	102	129	2083	74
Adj No. of Lanes	1	1	1	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	211	340	289	247	55	242	186	2392	1070	71	2151	941
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.11	0.66	0.66	0.08	1.00	1.00
Sat Flow, veh/h	1294	1900	1615	1181	310	1352	1714	3610	1615	1714	3610	1579
Grp Volume(v), veh/h	116	46	173	66	0	118	197	2552	102	129	2083	74
Grp Sat Flow(s),veh/h/ln	1294	1900	1615	1181	0	1661	1714	1805	1615	1714	1805	1579
Q Serve(g_s), s	10.4	2.4	11.8	6.0	0.0	7.5	13.0	79.5	2.7	5.0	0.0	0.0
Cycle Q Clear(g_c), s	18.0	2.4	11.8	8.4	0.0	7.5	13.0	79.5	2.7	5.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.81	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	211	340	289	247	0	298	186	2392	1070	71	2151	941
V/C Ratio(X)	0.55	0.14	0.60	0.27	0.00	0.40	1.06	1.07	0.10	1.81	0.97	0.08
Avail Cap(c_a), veh/h	432	665	565	449	0	582	186	2392	1070	71	2151	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	51.5	41.4	45.3	45.0	0.0	43.5	53.5	20.2	7.3	55.0	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.1	1.5	0.4	0.0	0.6	83.1	39.4	0.2	367.7	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	1.3	5.4	2.0	0.0	3.5	10.4	52.3	1.3	9.6	0.6	0.0
LnGrp Delay(d),s/veh	53.1	41.6	46.7	45.4	0.0	44.2	136.6	59.6	7.5	422.7	2.0	0.0
LnGrp LOS	D	D	D	D		D	F	F	A	F	A	A
Approach Vol, veh/h		335			184			2851			2286	
Approach Delay, s/veh		48.2			44.6			63.1			25.7	
Approach LOS		D			D			E			C	

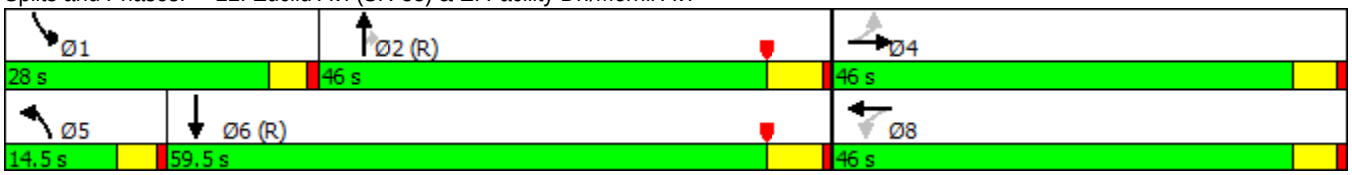
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	85.2		26.3	16.5	77.2		26.3
Change Period (Y+Rc), s	3.5	5.7		4.8	3.5	5.7		4.8
Max Green Setting (Gmax), s	5.0	59.0		42.0	13.0	51.0		42.0
Max Q Clear Time (g_c+I1), s	7.0	81.5		20.0	15.0	2.0		10.4
Green Ext Time (p_c), s	0.0	0.0		1.5	0.0	47.9		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	46.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	6	27	176	0	2	2280	251	612	1898
Future Volume (vph)	6	27	176	0	2	2280	251	612	1898
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	10.0	46.0	46.0	14.5	28.0	28.0	14.5	28.0
Total Split (s)	46.0	46.0	46.0	46.0	14.5	46.0	46.0	28.0	59.5
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.1%	38.3%	38.3%	23.3%	49.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		41.0		41.0	10.0	40.0	40.0	23.5	65.1
Actuated g/C Ratio		0.34		0.34	0.08	0.33	0.33	0.20	0.54
v/c Ratio		0.08		1.09	0.01	2.04	0.46	1.97	1.04
Control Delay		20.8		95.7	64.0	487.7	6.8	465.3	59.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.8		95.7	64.0	487.7	6.8	465.3	59.1
LOS		C		F	E	F	A	F	E
Approach Delay		20.8		95.7		439.7			158.1
Approach LOS		C		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.04	
Intersection Signal Delay: 275.8	Intersection LOS: F
Intersection Capacity Utilization 154.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	27	14	176	0	422	2	2280	251	612	1898	1
Future Volume (veh/h)	6	27	14	176	0	422	2	2280	251	612	1898	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	6	29	7	189	0	426	2	2452	241	658	2041	1
Adj No. of Lanes	0	1	0	0	1	0	1	2	1	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	86	396	89	202	3	374	9	1203	526	336	1940	1
Arrive On Green	0.34	0.34	0.34	0.34	0.00	0.34	0.01	0.33	0.33	0.20	0.52	0.52
Sat Flow, veh/h	150	1158	262	477	8	1094	1714	3610	1579	1714	3703	2
Grp Volume(v), veh/h	42	0	0	615	0	0	2	2452	241	658	995	1047
Grp Sat Flow(s),veh/h/ln	1570	0	0	1579	0	0	1714	1805	1579	1714	1805	1900
Q Serve(g_s), s	0.0	0.0	0.0	39.2	0.0	0.0	0.1	40.0	14.4	23.5	62.9	62.9
Cycle Q Clear(g_c), s	1.8	0.0	0.0	41.0	0.0	0.0	0.1	40.0	14.4	23.5	62.9	62.9
Prop In Lane	0.14		0.17	0.31		0.69	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	571	0	0	579	0	0	9	1203	526	336	945	995
V/C Ratio(X)	0.07	0.00	0.00	1.06	0.00	0.00	0.22	2.04	0.46	1.96	1.05	1.05
Avail Cap(c_a), veh/h	571	0	0	579	0	0	143	1203	526	336	945	995
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	0.0	0.0	40.8	0.0	0.0	59.4	40.0	31.5	48.3	28.6	28.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	55.2	0.0	0.0	0.4	467.2	0.3	442.7	44.0	43.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	28.0	0.0	0.0	0.1	98.0	6.3	52.4	42.8	44.9
LnGrp Delay(d),s/veh	26.6	0.0	0.0	96.0	0.0	0.0	59.8	507.2	31.7	490.9	72.6	71.9
LnGrp LOS	C			F			E	F	C	F	F	F
Approach Vol, veh/h		42			615			2695			2700	
Approach Delay, s/veh		26.6			96.0			464.4			174.3	
Approach LOS		C			F			F			F	

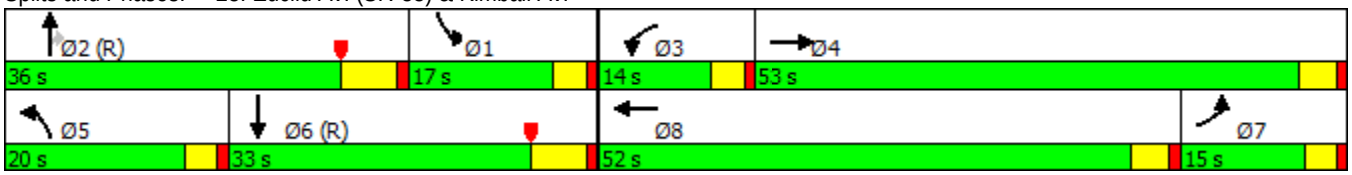
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.0	46.0		46.0	5.1	68.9		46.0
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	23.5	40.0		41.0	10.0	53.5		41.0
Max Q Clear Time (g_c+I1), s	25.5	42.0		3.8	2.1	64.9		43.0
Green Ext Time (p_c), s	0.0	0.0		2.8	0.0	0.0		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		294.5	
HCM 2010 LOS		F	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	277	575	319	558	195	1330	300	406	1275
Future Volume (vph)	277	575	319	558	195	1330	300	406	1275
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	14.0	45.5	14.0	36.0	36.0	9.0	33.0
Total Split (s)	15.0	53.0	14.0	52.0	20.0	36.0	36.0	17.0	33.0
Total Split (%)	12.5%	44.2%	11.7%	43.3%	16.7%	30.0%	30.0%	14.2%	27.5%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	5.0	5.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	16.5	48.5	10.0	42.0	15.6	30.0	30.0	13.0	27.4
Actuated g/C Ratio	0.14	0.40	0.08	0.35	0.13	0.25	0.25	0.11	0.23
v/c Ratio	1.23	0.59	2.34	0.90	0.91	1.54	0.57	2.29	1.92
Control Delay	165.6	21.5	648.2	38.2	61.8	273.6	19.4	601.9	434.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	165.6	21.5	648.2	38.2	61.8	273.6	19.4	601.9	434.9
LOS	F	C	F	D	E	F	B	F	F
Approach Delay		58.4		170.8		209.2			470.5
Approach LOS		E		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 40 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.34	
Intersection Signal Delay: 253.5	Intersection LOS: F
Intersection Capacity Utilization 126.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	277	575	232	319	558	589	195	1330	300	406	1275	226
Future Volume (veh/h)	277	575	232	319	558	589	195	1330	300	406	1275	226
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	289	599	238	332	581	580	203	1385	297	423	1328	217
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	157	990	393	143	685	613	229	902	404	417	1170	189
Arrive On Green	0.18	0.78	0.78	0.08	0.38	0.38	0.04	0.08	0.08	0.24	0.38	0.38
Sat Flow, veh/h	1714	2526	1002	1714	1805	1615	1714	3610	1615	1714	3106	502
Grp Volume(v), veh/h	289	428	409	332	581	580	203	1385	297	423	766	779
Grp Sat Flow(s),veh/h/ln	1714	1805	1723	1714	1805	1615	1714	1805	1615	1714	1805	1804
Q Serve(g_s), s	11.0	11.7	11.7	10.0	35.4	41.7	14.1	30.0	20.8	29.2	45.2	45.2
Cycle Q Clear(g_c), s	11.0	11.7	11.7	10.0	35.4	41.7	14.1	30.0	20.8	29.2	45.2	45.2
Prop In Lane	1.00		0.58	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	157	707	675	143	685	613	229	903	404	417	680	680
V/C Ratio(X)	1.84	0.60	0.61	2.32	0.85	0.95	0.89	1.53	0.74	1.01	1.13	1.15
Avail Cap(c_a), veh/h	157	730	696	143	714	639	229	903	404	417	680	680
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.57	0.57	0.57	1.00	1.00	1.00	0.20	0.20	0.20	0.09	0.09	0.09
Uniform Delay (d), s/veh	49.0	9.2	9.2	55.0	34.1	36.1	56.5	55.0	47.5	45.4	37.4	37.4
Incr Delay (d2), s/veh	391.4	0.8	0.8	617.2	8.6	22.4	8.5	241.7	2.4	16.8	58.9	67.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.2	5.6	5.4	29.2	19.2	22.3	7.3	45.3	9.6	15.7	33.6	35.2
LnGrp Delay(d),s/veh	440.4	9.9	10.0	672.2	42.7	58.5	64.9	296.8	49.9	62.2	96.3	105.1
LnGrp LOS	F	A	A	F	D	E	E	F	D	F	F	F
Approach Vol, veh/h		1126			1493			1885			1968	
Approach Delay, s/veh		120.4			188.8			232.9			92.5	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.7	36.0	14.0	51.5	20.0	51.7	15.5	50.0
Change Period (Y+Rc), s	6.0	* 6	4.0	4.5	4.0	6.0	4.5	* 4.5
Max Green Setting (Gmax), s	13.0	* 30	10.0	48.5	16.0	27.0	11.0	* 48
Max Q Clear Time (g_c+I1), s	31.2	32.0	12.0	13.7	16.1	47.2	13.0	43.7
Green Ext Time (p_c), s	0.0	0.0	0.0	5.7	0.0	0.0	0.0	1.8

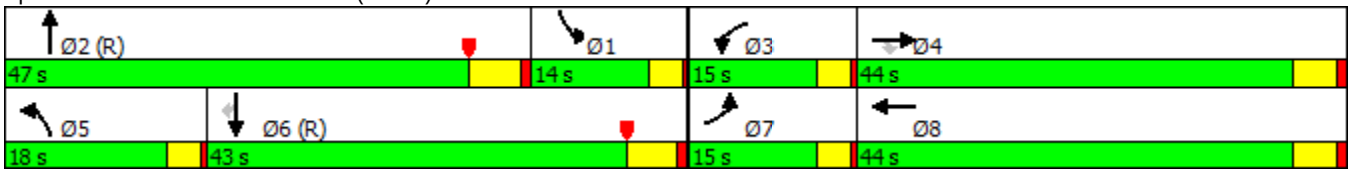
Intersection Summary	
HCM 2010 Ctrl Delay	160.5
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	175	58	60	65	18	15	1429	161	1499	47
Future Volume (vph)	175	58	60	65	18	15	1429	161	1499	47
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	15.0	44.0	44.0	15.0	44.0	18.0	47.0	14.0	43.0	43.0
Total Split (%)	12.5%	36.7%	36.7%	12.5%	36.7%	15.0%	39.2%	11.7%	35.8%	35.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.5	18.4	18.4	9.0	14.2	5.9	66.3	10.5	76.1	76.1
Actuated g/C Ratio	0.10	0.15	0.15	0.08	0.12	0.05	0.55	0.09	0.63	0.63
v/c Ratio	1.19	0.22	0.18	0.56	0.66	0.20	0.83	1.20	0.73	0.05
Control Delay	177.3	44.2	1.1	69.8	21.6	62.6	16.5	136.8	12.8	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	177.3	44.2	1.1	69.8	21.6	62.6	16.5	136.8	12.8	0.9
LOS	F	D	A	E	C	E	B	F	B	A
Approach Delay		114.8			33.0		17.0		24.1	
Approach LOS		F			C		B		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 88.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	58	60	65	18	190	15	1429	52	161	1499	47
Future Volume (veh/h)	175	58	60	65	18	190	15	1429	52	161	1499	47
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	194	64	48	72	20	199	17	1588	48	179	1666	52
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	164	377	321	91	23	232	31	1237	37	411	2110	924
Arrive On Green	0.10	0.20	0.20	0.05	0.16	0.16	0.04	0.69	0.69	0.24	0.58	0.58
Sat Flow, veh/h	1714	1900	1615	1714	150	1488	1714	3575	108	1714	3610	1582
Grp Volume(v), veh/h	194	64	48	72	0	219	17	800	836	179	1666	52
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	0	1637	1714	1805	1878	1714	1805	1582
Q Serve(g_s), s	11.5	3.4	2.9	5.0	0.0	15.6	1.2	41.5	41.5	10.6	42.7	1.7
Cycle Q Clear(g_c), s	11.5	3.4	2.9	5.0	0.0	15.6	1.2	41.5	41.5	10.6	42.7	1.7
Prop In Lane	1.00		1.00	1.00		0.91	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	164	377	321	91	0	255	31	624	650	411	2110	924
V/C Ratio(X)	1.18	0.17	0.15	0.79	0.00	0.86	0.55	1.28	1.29	0.44	0.79	0.06
Avail Cap(c_a), veh/h	164	618	525	164	0	532	207	624	650	411	2110	924
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.3	39.9	39.7	56.2	0.0	49.3	57.4	18.5	18.5	38.7	19.2	10.7
Incr Delay (d2), s/veh	127.2	0.1	0.1	5.7	0.0	3.2	0.5	127.6	130.6	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	1.8	1.3	2.5	0.0	7.3	0.6	41.9	44.1	5.0	21.1	0.7
LnGrp Delay(d),s/veh	181.4	39.9	39.8	61.8	0.0	52.6	57.9	146.1	149.1	38.7	19.5	10.7
LnGrp LOS	F	D	D	E		D	E	F	F	D	B	B
Approach Vol, veh/h		306			291			1653			1897	
Approach Delay, s/veh		129.6			54.9			146.7			21.1	
Approach LOS		F			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.3	47.0	9.9	28.8	5.7	75.6	15.0	23.7
Change Period (Y+Rc), s	5.5	* 5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	10.5	* 42	11.5	39.0	14.5	37.5	11.5	39.0
Max Q Clear Time (g_c+I1), s	12.6	43.5	7.0	5.4	3.2	44.7	13.5	17.6
Green Ext Time (p_c), s	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1

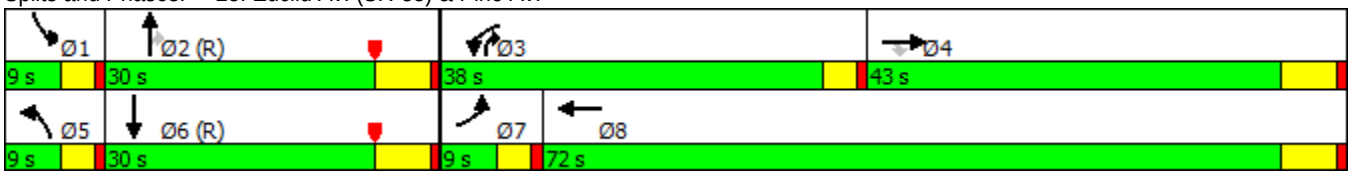
Intersection Summary	
HCM 2010 Ctrl Delay	81.5
HCM 2010 LOS	F

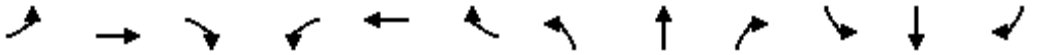
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	135	865	367	851	552	212	1064	770	356	1346
Future Volume (vph)	135	865	367	851	552	212	1064	770	356	1346
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	38.0	72.0	9.0	30.0	38.0	9.0	30.0
Total Split (%)	7.5%	35.8%	35.8%	31.7%	60.0%	7.5%	25.0%	31.7%	7.5%	25.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	5.0	37.5	37.5	33.5	66.0	5.0	24.0	63.5	5.0	24.0
Actuated g/C Ratio	0.04	0.31	0.31	0.28	0.55	0.04	0.20	0.53	0.04	0.20
v/c Ratio	1.96	1.50	0.63	0.95	0.88	3.08	1.52	0.90	5.17	2.10
Control Delay	507.7	266.5	27.6	62.2	34.7	961.9	267.1	21.8	1905.1	522.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	507.7	266.5	27.6	62.2	34.7	961.9	267.1	21.8	1905.1	522.2
LOS	F	F	C	E	C	F	F	C	F	F
Approach Delay		226.2			48.4		246.9			793.4
Approach LOS		F			D		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 5.17	
Intersection Signal Delay: 336.8	Intersection LOS: F
Intersection Capacity Utilization 141.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	865	367	851	552	308	212	1064	770	356	1346	113
Future Volume (veh/h)	135	865	367	851	552	308	212	1064	770	356	1346	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	139	892	0	877	569	312	219	1097	361	367	1388	112
Adj No. of Lanes	1	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	586	498	923	629	345	71	742	781	71	695	56
Arrive On Green	0.04	0.31	0.00	0.28	0.54	0.54	0.04	0.21	0.21	0.01	0.07	0.07
Sat Flow, veh/h	1714	1900	1615	3326	1155	633	1714	3610	1615	1714	3378	271
Grp Volume(v), veh/h	139	892	0	877	0	881	219	1097	361	367	739	761
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1663	0	1788	1714	1805	1615	1714	1805	1844
Q Serve(g_s), s	5.0	37.0	0.0	31.0	0.0	53.1	5.0	24.7	17.8	5.0	24.7	24.7
Cycle Q Clear(g_c), s	5.0	37.0	0.0	31.0	0.0	53.1	5.0	24.7	17.8	5.0	24.7	24.7
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	71	586	498	923	0	973	71	742	781	71	371	379
V/C Ratio(X)	1.95	1.52	0.00	0.95	0.00	0.91	3.07	1.48	0.46	5.14	1.99	2.01
Avail Cap(c_a), veh/h	71	586	498	942	0	984	71	742	781	71	371	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.09	0.09	0.09	0.50	0.50	0.50
Uniform Delay (d), s/veh	57.5	41.5	0.0	42.5	0.0	24.6	57.5	47.7	20.6	59.2	55.9	55.9
Incr Delay (d2), s/veh	472.4	243.8	0.0	17.9	0.0	11.8	933.1	215.6	0.2	1877.6	450.2	457.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	59.0	0.0	16.5	0.0	29.1	20.9	34.5	8.0	39.6	58.8	60.9
LnGrp Delay(d),s/veh	529.9	285.3	0.0	60.4	0.0	36.4	990.6	263.2	20.8	1936.8	506.2	513.8
LnGrp LOS	F	F		E		D	F	F	C	F	F	F
Approach Vol, veh/h		1031			1758			1677			1867	
Approach Delay, s/veh		318.3			48.4			306.0			790.5	
Approach LOS		F			D			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	30.7	37.3	43.0	9.0	30.7	9.0	71.3
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	24.0	34.0	37.0	5.0	24.0	5.0	66.0
Max Q Clear Time (g_c+I1), s	7.0	26.7	33.0	39.0	7.0	26.7	7.0	55.1
Green Ext Time (p_c), s	0.0	0.0	0.3	0.0	0.0	0.0	0.0	9.2

Intersection Summary	
HCM 2010 Ctrl Delay	379.3
HCM 2010 LOS	F

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	829	228	395	2165	262	1252
Future Volume (vph)	829	228	395	2165	262	1252
Turn Type	NA	Perm	Prot	NA	Prot	Prot
Protected Phases	2		1	6	8	8
Permitted Phases		2				
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	28.5	28.5	8.5	9.5	8.5	8.5
Total Split (s)	48.0	48.0	36.0	84.0	36.0	36.0
Total Split (%)	40.0%	40.0%	30.0%	70.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	4.5	3.5	3.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	Min	C-Max	Min	Min
Act Effct Green (s)	44.1	44.1	31.9	79.5	32.5	32.5
Actuated g/C Ratio	0.37	0.37	0.27	0.66	0.27	0.27
v/c Ratio	0.69	0.34	0.97	1.01	0.34	1.76
Control Delay	40.2	11.7	64.1	24.7	36.6	365.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	11.7	64.1	24.7	36.6	365.7
LOS	D	B	E	C	D	F
Approach Delay	34.1			30.8	308.8	
Approach LOS	C			C	F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.76	
Intersection Signal Delay: 113.5	Intersection LOS: F
Intersection Capacity Utilization 107.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 26: SR-71 NB Ramps & Euclid Av. (SR-83)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	829	228	395	2165	262	1252
Future Volume (veh/h)	829	228	395	2165	262	1252
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1700	1900
Adj Flow Rate, veh/h	921	0	439	2406	291	0
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1881	841	461	2956	360	185
Arrive On Green	0.52	0.00	0.27	0.82	0.11	0.00
Sat Flow, veh/h	3705	1615	1714	3705	3141	1615
Grp Volume(v), veh/h	921	0	439	2406	291	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1714	1805	1570	1615
Q Serve(g_s), s	19.7	0.0	30.2	43.5	10.8	0.0
Cycle Q Clear(g_c), s	19.7	0.0	30.2	43.5	10.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1881	841	461	2956	360	185
V/C Ratio(X)	0.49	0.00	0.95	0.81	0.81	0.00
Avail Cap(c_a), veh/h	1881	841	464	2956	851	437
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	18.5	0.0	43.1	5.9	51.8	0.0
Incr Delay (d2), s/veh	0.9	0.0	5.2	0.2	4.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	0.0	14.9	21.2	4.9	0.0
LnGrp Delay(d),s/veh	19.4	0.0	48.3	6.1	56.2	0.0
LnGrp LOS	B		D	A	E	
Approach Vol, veh/h	921			2845	291	
Approach Delay, s/veh	19.4			12.7	56.2	
Approach LOS	B			B	E	

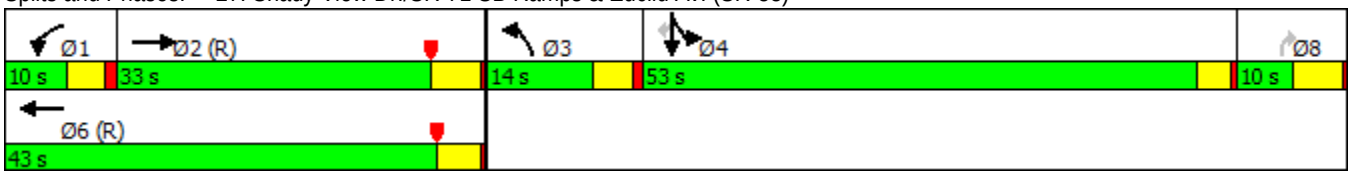
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	35.7	67.0				102.8		17.2
Change Period (Y+Rc), s	3.5	4.5				4.5		3.5
Max Green Setting (Gmax), s	32.5	43.5				79.5		32.5
Max Q Clear Time (g_c+I1), s	32.2	21.7				45.5		12.8
Green Ext Time (p_c), s	0.0	19.5				28.8		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	17.3
HCM 2010 LOS	B

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	415	115	825	35	18	714	164	102
Future Volume (vph)	415	115	825	35	18	714	164	102
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	33.0	10.0	43.0	14.0	10.0	53.0	53.0	53.0
Total Split (%)	27.5%	8.3%	35.8%	11.7%	8.3%	44.2%	44.2%	44.2%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lag	Lead		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	33.6	15.0	53.6	7.8	5.0	40.4	40.4	40.4
Actuated g/C Ratio	0.28	0.12	0.45	0.06	0.04	0.34	0.34	0.34
v/c Ratio	0.48	0.56	0.53	0.33	0.10	0.82	0.77	0.16
Control Delay	38.5	57.9	17.7	61.0	1.0	48.7	44.4	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	57.9	17.7	61.0	1.0	48.7	44.4	1.8
LOS	D	E	B	E	A	D	D	A
Approach Delay	38.5		22.6				41.9	
Approach LOS	D		C				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 91.5 (76%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 33.8	Intersection LOS: C
Intersection Capacity Utilization 61.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	415	50	115	825	0	35	0	18	714	164	102
Future Volume (veh/h)	0	415	50	115	825	0	35	0	18	714	164	102
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0	1800	0	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	428	52	119	851	0	36	0	19	857	0	105
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1822	220	79	2328	0	0	0	0	975	0	459
Arrive On Green	0.00	0.56	0.56	0.09	1.00	0.00	0.00	0.00	0.00	0.28	0.00	0.28
Sat Flow, veh/h	0	3339	392	1714	3705	0		0		3429	0	1615
Grp Volume(v), veh/h	0	237	243	119	851	0		0.0		857	0	105
Grp Sat Flow(s),veh/h/ln	0	1805	1831	1714	1805	0				1714	0	1615
Q Serve(g_s), s	0.0	8.0	8.0	5.5	0.0	0.0				28.6	0.0	6.0
Cycle Q Clear(g_c), s	0.0	8.0	8.0	5.5	0.0	0.0				28.6	0.0	6.0
Prop In Lane	0.00		0.21	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1014	1028	79	2328	0				975	0	459
V/C Ratio(X)	0.00	0.23	0.24	1.51	0.37	0.00				0.88	0.00	0.23
Avail Cap(c_a), veh/h	0	1014	1028	79	2328	0				1414	0	666
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.3	13.3	54.5	0.0	0.0				41.0	0.0	32.9
Incr Delay (d2), s/veh	0.0	0.5	0.5	286.1	0.4	0.0				4.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.1	4.2	8.8	0.1	0.0				14.2	0.0	2.7
LnGrp Delay(d),s/veh	0.0	13.8	13.8	340.6	0.4	0.0				45.7	0.0	33.1
LnGrp LOS		B	B	F	A					D		C
Approach Vol, veh/h		480			970						962	
Approach Delay, s/veh		13.8			42.2						44.3	
Approach LOS		B			D						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	10.0	72.4		37.6		82.4		
Change Period (Y+Rc), s	4.5	5.0		3.5		* 5		
Max Green Setting (Gmax), s	5.5	28.0		49.5		* 39		
Max Q Clear Time (g_c+I1), s	7.5	10.0		30.6		2.0		
Green Ext Time (p_c), s	0.0	6.0		3.5		7.1		

Intersection Summary	
HCM 2010 Ctrl Delay	37.4
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↱			↱
Traffic Vol, veh/h	0	312	392	2	0	25
Future Vol, veh/h	0	312	392	2	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	339	426	2	0	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	427
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	632
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	632
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	632
HCM Lane V/C Ratio	-	-	-	0.043
HCM Control Delay (s)	-	-	-	11
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↱			↱
Traffic Vol, veh/h	0	312	373	2	0	20
Future Vol, veh/h	0	312	373	2	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	339	405	2	0	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	407
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	648
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	648
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	648
HCM Lane V/C Ratio	-	-	-	0.034
HCM Control Delay (s)	-	-	-	10.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1361	58	4	1413	205	15
Future Volume (vph)	1361	58	4	1413	205	15
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	78.3	78.3	9.6	87.9	32.1	32.1
Total Split (%)	65.3%	65.3%	8.0%	73.3%	26.8%	26.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	80.1	80.1	5.0	81.9	19.6	19.6
Actuated g/C Ratio	0.71	0.71	0.04	0.73	0.17	0.17
v/c Ratio	1.10	0.05	0.05	1.11	0.75	0.05
Control Delay	74.7	3.6	55.8	80.5	60.2	16.4
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	74.7	3.6	55.8	80.7	60.2	16.4
LOS	E	A	E	F	E	B
Approach Delay	71.8			80.6	57.3	
Approach LOS	E			F	E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 74.8	Intersection LOS: E
Intersection Capacity Utilization 95.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1361	58	4	1413	205	15
Future Volume (veh/h)	1361	58	4	1413	205	15
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1479	63	4	1536	223	16
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1329	1130	9	1419	257	242
Arrive On Green	0.70	0.70	0.01	0.75	0.15	0.15
Sat Flow, veh/h	1900	1615	1714	1900	1714	1615
Grp Volume(v), veh/h	1479	63	4	1536	223	16
Grp Sat Flow(s),veh/h/ln	1900	1615	1714	1900	1714	1615
Q Serve(g_s), s	76.5	1.3	0.3	81.7	13.9	0.9
Cycle Q Clear(g_c), s	76.5	1.3	0.3	81.7	13.9	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1329	1130	9	1419	257	242
V/C Ratio(X)	1.11	0.06	0.45	1.08	0.87	0.07
Avail Cap(c_a), veh/h	1329	1130	78	1419	423	399
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	5.1	54.3	13.9	45.4	39.9
Incr Delay (d2), s/veh	61.8	0.0	12.4	49.6	10.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	62.3	0.6	0.2	61.3	7.3	0.4
LnGrp Delay(d),s/veh	78.2	5.2	66.6	63.5	55.6	40.0
LnGrp LOS	F	A	E	F	E	D
Approach Vol, veh/h	1542			1540	239	
Approach Delay, s/veh	75.2			63.5	54.5	
Approach LOS	E			E	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.2	82.7				87.9		21.5
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.0	72.1				81.7		27.0
Max Q Clear Time (g_c+I1), s	2.3	78.5				83.7		15.9
Green Ext Time (p_c), s	0.0	0.0				0.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	68.3
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	25	0	220	59	3
Future Vol, veh/h	0	25	0	220	59	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	27	0	239	64	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	66	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	1003	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	1003	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1003	-	-
HCM Lane V/C Ratio	-	0.027	-	-
HCM Control Delay (s)	-	8.7	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	58	162	1	16	68
Future Vol, veh/h	5	58	162	1	16	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	63	176	1	17	74

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	286	177	0	0	177	0
Stage 1	177	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	7.1	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	670	871	-	-	1411	-
Stage 1	829	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	663	871	-	-	1411	-
Mov Cap-2 Maneuver	693	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	889	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	1.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	854	1411	-
HCM Lane V/C Ratio	-	-	0.08	0.012	-
HCM Control Delay (s)	-	-	9.6	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	18	146	1	5	68
Future Vol, veh/h	5	18	146	1	5	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	20	159	1	5	74

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	244	159	0	0	160	0
Stage 1	159	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	749	892	-	-	1432	-
Stage 1	875	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	746	892	-	-	1432	-
Mov Cap-2 Maneuver	752	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	857	1432	-
HCM Lane V/C Ratio	-	-	0.029	0.004	-
HCM Control Delay (s)	-	-	9.3	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	11	3	142	72	2
Future Vol, veh/h	6	11	3	142	72	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	12	3	154	78	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	240	79	80	0	-	0
Stage 1	79	-	-	-	-	-
Stage 2	161	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	753	987	1531	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	751	987	1531	-	-	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1531	-	890	-	-
HCM Lane V/C Ratio	0.002	-	0.021	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	140	1	1	81
Future Vol, veh/h	5	5	140	1	1	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	5	152	1	1	88

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	243	153	0	0	153	0
Stage 1	153	-	-	-	-	-
Stage 2	90	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	750	898	-	-	1440	-
Stage 1	880	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	749	898	-	-	1440	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	938	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	820	1440	-
HCM Lane V/C Ratio	-	-	0.013	0.001	-
HCM Control Delay (s)	-	-	9.4	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	5	9	106	78	8
Future Vol, veh/h	35	5	9	106	78	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	38	5	10	115	85	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	224	89	93	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	769	975	1514	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	764	975	1514	-	-	-
Mov Cap-2 Maneuver	764	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	890	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	785	-	-
HCM Lane V/C Ratio	0.006	-	0.055	-	-
HCM Control Delay (s)	7.4	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	10	3	85	76	7
Future Vol, veh/h	30	10	3	85	76	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	33	11	3	92	83	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	185	86	90	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	99	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	809	978	1518	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	807	978	1518	-	-	-
Mov Cap-2 Maneuver	795	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	928	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1518	-	834	-	-
HCM Lane V/C Ratio	0.002	-	0.052	-	-
HCM Control Delay (s)	7.4	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	10	3	57	77	9
Future Vol, veh/h	31	10	3	57	77	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	34	11	3	62	84	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	157	89	93	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	839	975	1514	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	837	975	1514	-	-	-
Mov Cap-2 Maneuver	815	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	958	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	849	-	-
HCM Lane V/C Ratio	0.002	-	0.052	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	7	2	50	84	3
Future Vol, veh/h	10	7	2	50	84	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	8	2	54	91	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	152	93	95	0	-	0
Stage 1	93	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	844	970	1512	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	843	970	1512	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1512	-	874	-	-
HCM Lane V/C Ratio	0.001	-	0.021	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	35	14	34	86	5
Future Vol, veh/h	18	35	14	34	86	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	20	38	15	37	93	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	163	96	99	0	-	0
Stage 1	96	-	-	-	-	-
Stage 2	67	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	806	966	1507	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	800	966	1507	-	-	-
Mov Cap-2 Maneuver	785	-	-	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1507	-	896	-	-
HCM Lane V/C Ratio	0.01	-	0.064	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	8	38	118	3
Future Vol, veh/h	10	10	8	38	118	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	11	9	41	128	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	189	130	132	0	-	0
Stage 1	130	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	805	925	1466	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	800	925	1466	-	-	-
Mov Cap-2 Maneuver	787	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	963	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1466	-	850	-	-
HCM Lane V/C Ratio	0.006	-	0.026	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	271	276	6	30	98
Future Vol, veh/h	41	271	276	6	30	98
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	300	100	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	45	295	300	7	33	107

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	300	0	-	0	684	300
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	384	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1273	-	-	-	417	744
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	693	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1273	-	-	-	402	744
Mov Cap-2 Maneuver	-	-	-	-	573	-
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	669	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1273	-	-	-	573	744
HCM Lane V/C Ratio	0.035	-	-	-	0.057	0.143
HCM Control Delay (s)	7.9	-	-	-	11.7	10.6
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.5

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1369	7	0	1418	0	25
Future Vol, veh/h	1369	7	0	1418	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1488	8	0	1541	0	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	744
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	362
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	362
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

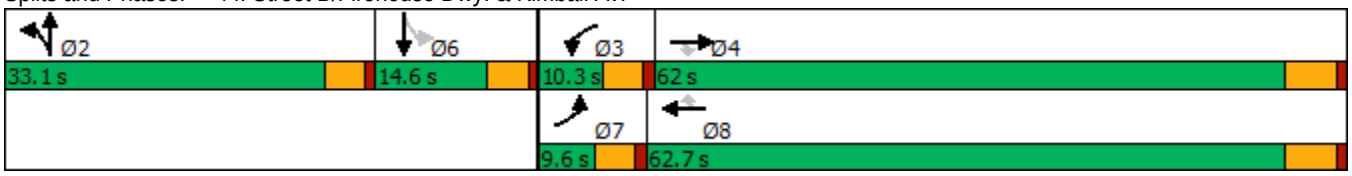
Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	362	-	-	-
HCM Lane V/C Ratio	0.075	-	-	-
HCM Control Delay (s)	15.8	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Lane Group	EBT	EBR	WBL	WBT	NBT	Ø6	Ø7
Lane Configurations							
Traffic Volume (vph)	1323	71	21	1127	0		
Future Volume (vph)	1323	71	21	1127	0		
Turn Type	NA	Perm	Prot	NA	NA		
Protected Phases	4		3	8	2	6	7
Permitted Phases		4					
Detector Phase	4	4	3	8	2		
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0
Minimum Split (s)	23.8	23.8	9.6	15.8	31.6	14.6	9.6
Total Split (s)	62.0	62.0	10.3	62.7	33.1	14.6	9.6
Total Split (%)	51.7%	51.7%	8.6%	52.3%	27.6%	12%	8%
Yellow Time (s)	4.8	4.8	3.6	4.8	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.8	5.8	4.6	5.8	4.6		
Lead/Lag	Lag	Lag	Lead	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes
Recall Mode	Min	Min	None	Min	None	None	None
Act Effct Green (s)	36.4	36.4	6.0	39.4	16.9		
Actuated g/C Ratio	0.54	0.54	0.09	0.58	0.25		
v/c Ratio	0.69	0.07	0.14	0.57	0.60		
Control Delay	14.5	1.6	42.3	9.7	22.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0		
Total Delay	14.5	1.6	42.3	9.7	22.8		
LOS	B	A	D	A	C		
Approach Delay	13.9			10.3	22.8		
Approach LOS	B			B	C		

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 68	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 44: Street B/Firehouse Dwy. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1323	71	21	1127	0	290	0	28	0	0	0
Future Volume (veh/h)	0	1323	71	21	1127	0	290	0	28	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	1393	75	22	1186	0	305	0	29	0	0	0
Adj No. of Lanes	1	2	1	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	3	1930	820	43	2182	976	384	0	37	0	3	0
Arrive On Green	0.00	0.51	0.51	0.03	0.60	0.00	0.23	0.00	0.23	0.00	0.00	0.00
Sat Flow, veh/h	1714	3800	1615	1714	3610	1615	1635	0	155	0	1900	0
Grp Volume(v), veh/h	0	1393	75	22	1186	0	334	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	1805	1615	1791	0	0	0	1900	0
Q Serve(g_s), s	0.0	18.4	1.5	0.8	12.5	0.0	11.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	18.4	1.5	0.8	12.5	0.0	11.3	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.91		0.09	0.00		0.00
Lane Grp Cap(c), veh/h	3	1930	820	43	2182	976	421	0	0	0	3	0
V/C Ratio(X)	0.00	0.72	0.09	0.51	0.54	0.00	0.79	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	133	3303	1404	151	3177	1421	789	0	0	0	294	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	12.4	8.2	31.1	7.5	0.0	23.3	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	3.4	0.2	0.0	3.4	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.6	0.7	0.4	6.2	0.0	6.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.9	8.3	34.5	7.7	0.0	26.7	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		B	A	C	A		C					
Approach Vol, veh/h		1468			1208			334			0	
Approach Delay, s/veh		12.6			8.2			26.7			0.0	
Approach LOS		B			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		19.8	6.2	38.6		0.0	0.0	44.9
Change Period (Y+Rc), s		4.6	4.6	5.8		4.6	4.6	5.8
Max Green Setting (Gmax), s		28.5	5.7	56.2		10.0	5.0	56.9
Max Q Clear Time (g_c+I1), s		13.3	2.8	20.4		0.0	0.0	14.5
Green Ext Time (p_c), s		1.9	0.0	12.4		0.0	0.0	9.7

Intersection Summary	
HCM 2010 Ctrl Delay	12.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	0	0	0	0	36	0	237	0	12	67	13
Future Vol, veh/h	45	0	0	0	0	36	0	237	0	12	67	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	49	0	0	0	0	39	0	258	0	13	73	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	383	364	80	364	371	258	87	0	0	258	0	0
Stage 1	106	106	-	258	258	-	-	-	-	-	-	-
Stage 2	277	258	-	106	113	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	579	567	986	596	562	786	1522	-	-	1318	-	-
Stage 1	905	811	-	751	698	-	-	-	-	-	-	-
Stage 2	734	698	-	905	806	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	546	561	986	591	556	786	1522	-	-	1318	-	-
Mov Cap-2 Maneuver	546	561	-	591	556	-	-	-	-	-	-	-
Stage 1	905	803	-	751	698	-	-	-	-	-	-	-
Stage 2	697	698	-	896	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.2	9.8	0	1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1522	-	-	546	786	1318	-	-
HCM Lane V/C Ratio	-	-	-	0.09	0.05	0.01	-	-
HCM Control Delay (s)	0	-	-	12.2	9.8	7.8	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	0	0	232	66	1
Future Vol, veh/h	5	0	0	232	66	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	0	252	72	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	324	72	73	0	-	0
Stage 1	72	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	674	996	1540	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	674	996	1540	-	-	-
Mov Cap-2 Maneuver	674	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	795	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1540	-	674	-	-
HCM Lane V/C Ratio	-	-	0.008	-	-
HCM Control Delay (s)	0	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	146	86	0	41	25
Future Vol, veh/h	0	146	86	0	41	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	159	93	0	45	27

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	209	93	0	0	93	0
Stage 1	93	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	784	970	-	-	1514	-
Stage 1	936	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	760	970	-	-	1514	-
Mov Cap-2 Maneuver	760	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	887	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	970	1514	-
HCM Lane V/C Ratio	-	-	0.164	0.029	-
HCM Control Delay (s)	-	-	9.4	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1346	4	0	1149	0	20
Future Vol, veh/h	1346	4	0	1149	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1463	4	0	1249	0	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	732
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	368
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	368
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	368	-	-	-
HCM Lane V/C Ratio	0.059	-	-	-
HCM Control Delay (s)	15.4	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1313	54	48	1114	34	43
Future Vol, veh/h	1313	54	48	1114	34	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1412	58	52	1198	37	46

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1470	0	2742	735
Stage 1	-	-	-	-	1441	-
Stage 2	-	-	-	-	1301	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	465	-	~ 19	367
Stage 1	-	-	-	-	188	-
Stage 2	-	-	-	-	258	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	465	-	~ 17	367
Mov Cap-2 Maneuver	-	-	-	-	135	-
Stage 1	-	-	-	-	188	-
Stage 2	-	-	-	-	229	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	27.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	135	367	-	-	465	-
HCM Lane V/C Ratio	0.271	0.126	-	-	0.111	-
HCM Control Delay (s)	41.3	16.2	-	-	13.7	-
HCM Lane LOS	E	C	-	-	B	-
HCM 95th %tile Q(veh)	1	0.4	-	-	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1338	54	171	1121	34	143
Future Vol, veh/h	1338	54	171	1121	34	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	100	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1439	58	184	1205	37	154

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1497	0	3041	748
Stage 1	-	-	-	-	1468	-
Stage 2	-	-	-	-	1573	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	454	-	~ 12	359
Stage 1	-	-	-	-	181	-
Stage 2	-	-	-	-	190	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	454	-	~ 7	359
Mov Cap-2 Maneuver	-	-	-	-	88	-
Stage 1	-	-	-	-	181	-
Stage 2	-	-	-	-	113	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	31.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	88	359	-	-	454	-
HCM Lane V/C Ratio	0.415	0.428	-	-	0.405	-
HCM Control Delay (s)	72.3	22.3	-	-	18.2	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	1.7	2.1	-	-	1.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1288	52	1113	49	61
Future Volume (vph)	1288	52	1113	49	61
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	35.1	9.7	44.8	15.2	15.2
Total Split (%)	58.5%	16.2%	74.7%	25.3%	25.3%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	32.2	5.1	37.9	10.1	10.1
Actuated g/C Ratio	0.54	0.09	0.64	0.17	0.17
v/c Ratio	0.73	0.38	0.97	0.18	0.20
Control Delay	14.6	33.8	31.6	23.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	33.8	31.6	23.2	8.6
LOS	B	C	C	C	A
Approach Delay	14.6		31.7	15.1	
Approach LOS	B		C	B	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 59.3			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 22.2		Intersection LOS: C	
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1288	68	52	1113	49	61
Future Volume (veh/h)	1288	68	52	1113	49	61
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1356	72	55	1172	52	62
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1769	94	86	1209	294	277
Arrive On Green	0.51	0.51	0.05	0.64	0.17	0.17
Sat Flow, veh/h	3577	184	1714	1900	1714	1615
Grp Volume(v), veh/h	701	727	55	1172	52	62
Grp Sat Flow(s),veh/h/ln	1805	1861	1714	1900	1714	1615
Q Serve(g_s), s	18.4	18.5	1.9	34.5	1.5	1.9
Cycle Q Clear(g_c), s	18.4	18.5	1.9	34.5	1.5	1.9
Prop In Lane		0.10	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	917	946	86	1209	294	277
V/C Ratio(X)	0.76	0.77	0.64	0.97	0.18	0.22
Avail Cap(c_a), veh/h	917	946	148	1246	294	277
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	11.7	27.4	10.1	20.8	21.0
Incr Delay (d2), s/veh	3.9	3.9	2.9	18.3	1.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	10.3	0.9	23.7	0.8	1.0
LnGrp Delay(d),s/veh	15.5	15.6	30.3	28.4	22.1	22.9
LnGrp LOS	B	B	C	C	C	C
Approach Vol, veh/h	1428			1227	114	
Approach Delay, s/veh	15.6			28.5	22.5	
Approach LOS	B			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.6	36.1				43.7		15.2
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	5.1	28.9				38.6		10.1
Max Q Clear Time (g_c+I1), s	3.9	20.5				36.5		3.9
Green Ext Time (p_c), s	0.0	7.5				1.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	21.6
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1413	237	1243	49	211
Future Volume (vph)	1413	237	1243	49	211
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	9.6	16.2	15.1	15.1
Total Split (s)	52.8	22.1	74.9	15.1	15.1
Total Split (%)	58.7%	24.6%	83.2%	16.8%	16.8%
Yellow Time (s)	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	42.1	15.2	61.9	10.1	10.1
Actuated g/C Ratio	0.50	0.18	0.74	0.12	0.12
v/c Ratio	0.86	0.80	0.93	0.25	0.57
Control Delay	24.3	54.1	22.1	39.7	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	54.1	22.1	39.7	11.9
LOS	C	D	C	D	B
Approach Delay	24.3		27.2	17.2	
Approach LOS	C		C	B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 83.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 83.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 50: Mill Creek Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1413	68	237	1243	49	211
Future Volume (veh/h)	1413	68	237	1243	49	211
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1487	72	249	1308	52	220
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1884	91	284	1437	196	185
Arrive On Green	0.54	0.54	0.17	0.76	0.11	0.11
Sat Flow, veh/h	3596	169	1714	1900	1714	1615
Grp Volume(v), veh/h	764	795	249	1308	52	220
Grp Sat Flow(s),veh/h/ln	1805	1865	1714	1900	1714	1615
Q Serve(g_s), s	29.6	30.0	12.4	47.1	2.4	10.0
Cycle Q Clear(g_c), s	29.6	30.0	12.4	47.1	2.4	10.0
Prop In Lane		0.09	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	971	1004	284	1437	196	185
V/C Ratio(X)	0.79	0.79	0.88	0.91	0.27	1.19
Avail Cap(c_a), veh/h	971	1004	343	1493	196	185
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	16.2	35.6	8.3	35.4	38.7
Incr Delay (d2), s/veh	4.3	4.4	17.2	8.5	3.3	127.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.8	16.5	7.2	27.4	1.3	11.0
LnGrp Delay(d),s/veh	20.5	20.6	52.8	16.8	38.6	165.7
LnGrp LOS	C	C	D	B	D	F
Approach Vol, veh/h	1559			1557	272	
Approach Delay, s/veh	20.6			22.5	141.4	
Approach LOS	C			C	F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	19.1	53.3				72.3		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	17.5	46.6				68.7		10.0
Max Q Clear Time (g_c+I1), s	14.4	32.0				49.1		12.0
Green Ext Time (p_c), s	0.1	13.3				17.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1114	216	976	189	184
Future Volume (vph)	1114	216	976	189	184
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	34.9	10.5	45.4	14.6	14.6
Total Split (%)	58.2%	17.5%	75.7%	24.3%	24.3%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	27.8	5.9	38.3	10.0	10.0
Actuated g/C Ratio	0.47	0.10	0.65	0.17	0.17
v/c Ratio	0.88	1.36	0.85	0.70	0.69
Control Delay	22.3	223.3	17.4	39.3	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	223.3	17.4	39.3	36.9
LOS	C	F	B	D	D
Approach Delay	22.3		54.7	38.1	
Approach LOS	C		D	D	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 59.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.36	
Intersection Signal Delay: 37.6	Intersection LOS: D
Intersection Capacity Utilization 74.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1114	234	216	976	189	184
Future Volume (veh/h)	1114	234	216	976	189	184
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1198	252	232	1049	203	192
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1405	293	170	1236	288	271
Arrive On Green	0.47	0.47	0.10	0.65	0.17	0.17
Sat Flow, veh/h	3057	617	1714	1900	1714	1615
Grp Volume(v), veh/h	725	725	232	1049	203	192
Grp Sat Flow(s),veh/h/ln	1805	1774	1714	1900	1714	1615
Q Serve(g_s), s	21.0	21.6	5.9	25.6	6.7	6.7
Cycle Q Clear(g_c), s	21.0	21.6	5.9	25.6	6.7	6.7
Prop In Lane		0.35	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	856	841	170	1236	288	271
V/C Ratio(X)	0.85	0.86	1.37	0.85	0.71	0.71
Avail Cap(c_a), veh/h	870	855	170	1251	288	271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.8	13.9	26.8	8.1	23.4	23.4
Incr Delay (d2), s/veh	7.8	8.8	197.6	5.6	13.6	14.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.1	12.5	12.1	15.0	4.2	4.1
LnGrp Delay(d),s/veh	21.5	22.7	224.4	13.7	36.9	37.9
LnGrp LOS	C	C	F	B	D	D
Approach Vol, veh/h	1450			1281	395	
Approach Delay, s/veh	22.1			51.9	37.4	
Approach LOS	C			D	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.5	34.4				44.9		14.6
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	5.9	28.7				39.2		10.0
Max Q Clear Time (g_c+I1), s	7.9	23.6				27.6		8.7
Green Ext Time (p_c), s	0.0	4.6				9.9		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	36.3
HCM 2010 LOS	D

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1394	216	1292	187	184
Future Volume (vph)	1394	216	1292	187	184
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.2	9.6	16.2	14.6	14.6
Total Split (s)	55.8	18.0	73.8	16.2	16.2
Total Split (%)	62.0%	20.0%	82.0%	18.0%	18.0%
Yellow Time (s)	5.2	3.6	5.2	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	4.6	6.2	4.6	4.6
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	48.1	13.2	65.9	11.6	11.6
Actuated g/C Ratio	0.54	0.15	0.75	0.13	0.13
v/c Ratio	0.91	0.91	0.98	0.89	0.88
Control Delay	26.8	77.0	32.0	78.7	72.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	77.0	32.0	78.7	72.1
LOS	C	E	C	E	E
Approach Delay	26.8		38.4	75.4	
Approach LOS	C		D	E	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 88.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 37.0	Intersection LOS: D
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 51: Main St. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1394	229	216	1292	187	184
Future Volume (veh/h)	1394	229	216	1292	187	184
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1499	246	232	1389	201	192
Adj No. of Lanes	2	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1709	275	256	1427	221	208
Arrive On Green	0.55	0.55	0.15	0.75	0.13	0.13
Sat Flow, veh/h	3199	499	1714	1900	1714	1615
Grp Volume(v), veh/h	859	886	232	1389	201	192
Grp Sat Flow(s),veh/h/ln	1805	1798	1714	1900	1714	1615
Q Serve(g_s), s	36.7	39.2	12.0	60.9	10.4	10.6
Cycle Q Clear(g_c), s	36.7	39.2	12.0	60.9	10.4	10.6
Prop In Lane		0.28	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	994	990	256	1427	221	208
V/C Ratio(X)	0.86	0.89	0.91	0.97	0.91	0.92
Avail Cap(c_a), veh/h	996	992	256	1429	221	208
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	17.9	37.6	10.4	38.6	38.7
Incr Delay (d2), s/veh	8.0	10.5	32.4	17.8	40.7	44.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.4	22.1	8.0	37.9	7.4	7.3
LnGrp Delay(d),s/veh	25.3	28.4	70.0	28.2	79.3	83.4
LnGrp LOS	C	C	E	C	E	F
Approach Vol, veh/h	1745			1621	393	
Approach Delay, s/veh	26.9			34.2	81.3	
Approach LOS	C			C	F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	18.0	55.7				73.7		16.2
Change Period (Y+Rc), s	4.6	6.2				6.2		4.6
Max Green Setting (Gmax), s	13.4	49.6				67.6		11.6
Max Q Clear Time (g_c+I1), s	14.0	41.2				62.9		12.6
Green Ext Time (p_c), s	0.0	8.1				4.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.7
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	277.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	319	886	93	22	713	14	84	16	22	127	25	395
Future Vol, veh/h	319	886	93	22	713	14	84	16	22	127	25	395
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	339	943	99	23	759	15	89	17	23	135	27	420

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	773	0	0	1045	0	0	2711	2495	525	1972	2537	766
Stage 1	-	-	-	-	-	-	1675	1675	-	813	813	-
Stage 2	-	-	-	-	-	-	1036	820	-	1159	1724	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	851	-	-	673	-	-	~ 12	29	502	~ 42	28	~ 406
Stage 1	-	-	-	-	-	-	101	153	-	375	395	-
Stage 2	-	-	-	-	-	-	282	392	-	212	145	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	851	-	-	673	-	-	-	~ 17	500	~ 16	~ 16	~ 406
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 68	32	-	~ 57	53	-
Stage 1	-	-	-	-	-	-	~ 61	92	-	226	382	-
Stage 2	-	-	-	-	-	-	-	379	-	~ 99	87	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0.3		$ 1368.3
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	851	-	-	673	-	-	149
HCM Lane V/C Ratio	-	0.399	-	-	0.035	-	-	3.905
HCM Control Delay (s)	-	12	-	-	10.5	-	-	$ 1368.3
HCM Lane LOS	-	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	-	1.9	-	-	0.1	-	-	57.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2448.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	309	1177	93	22	1032	116	84	16	22	377	25	392
Future Vol, veh/h	309	1177	93	22	1032	116	84	16	22	377	25	392
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	329	1252	99	23	1098	123	89	17	23	401	27	417

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1221	0	0	1355	0	0	3391	3231	680	2498	3219	1160
Stage 1	-	-	-	-	-	-	1963	1963	-	1206	1206	-
Stage 2	-	-	-	-	-	-	1428	1268	-	1292	2013	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	578	-	-	514	-	-	~ 4	~ 10	398	~ 17	~ 10	~ 240
Stage 1	-	-	-	-	-	-	~ 67	110	-	~ 226	259	-
Stage 2	-	-	-	-	-	-	169	242	-	~ 175	104	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	578	-	-	514	-	-	-	~ 4	396	~ 7	~ 4	~ 240
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 29	72	-	~ 18	~ 19	-
Stage 1	-	-	-	-	-	-	~ 29	47	-	~ 97	247	-
Stage 2	-	-	-	-	-	-	-	231	-	~ 45	45	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.7	0.2		$ 11294.9
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	578	-	-	514	-	-	33
HCM Lane V/C Ratio	-	0.569	-	-	0.046	-	-	25.596
HCM Control Delay (s)	-	19.1	-	-	12.3	-	-	$ 11294.9
HCM Lane LOS	-	C	-	-	B	-	-	F
HCM 95th %tile Q(veh)	-	3.6	-	-	0.1	-	-	104.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	952	52	23	647	2	30	0	15	11	0	71
Future Vol, veh/h	30	952	52	23	647	2	30	0	15	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	1082	59	26	735	2	34	0	17	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	737	0	0	1141	0	0	2004	1967	570	1395	1995	736
Stage 1	-	-	-	-	-	-	1177	1177	-	789	789	-
Stage 2	-	-	-	-	-	-	827	790	-	606	1206	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	878	-	-	620	-	-	40	64	470	111	61	422
Stage 1	-	-	-	-	-	-	206	267	-	387	405	-
Stage 2	-	-	-	-	-	-	369	404	-	456	259	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	878	-	-	620	-	-	~ 31	59	470	101	56	422
Mov Cap-2 Maneuver	-	-	-	-	-	-	150	204	-	101	56	-
Stage 1	-	-	-	-	-	-	198	257	-	372	388	-
Stage 2	-	-	-	-	-	-	289	387	-	423	249	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	30.1	22.3
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	194	878	-	-	620	-	-	296
HCM Lane V/C Ratio	0.264	0.037	-	-	0.042	-	-	0.301
HCM Control Delay (s)	30.1	9.3	-	-	11.1	-	-	22.3
HCM Lane LOS	D	A	-	-	B	-	-	C
HCM 95th %tile Q(veh)	1	0.1	-	-	0.1	-	-	1.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	1493	52	23	1069	2	30	0	15	11	0	71
Future Vol, veh/h	30	1493	52	23	1069	2	30	0	15	11	0	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	88	88	88	88	92	88	92	88	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	1697	59	26	1215	2	34	0	17	12	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1217	0	0	1756	0	0	3098	3060	878	2182	3089	1216
Stage 1	-	-	-	-	-	-	1791	1791	-	1268	1268	-
Stage 2	-	-	-	-	-	-	1307	1269	-	914	1821	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.3	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	580	-	-	361	-	-	~ 6	13	295	30	12	223
Stage 1	-	-	-	-	-	-	86	134	-	209	242	-
Stage 2	-	-	-	-	-	-	198	242	-	298	130	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	580	-	-	361	-	-	~ 4	11	295	26	11	223
Mov Cap-2 Maneuver	-	-	-	-	-	-	54	98	-	26	11	-
Stage 1	-	-	-	-	-	-	81	126	-	197	225	-
Stage 2	-	-	-	-	-	-	120	225	-	265	123	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	125.4	110.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	74	580	-	-	361	-	-	111
HCM Lane V/C Ratio	0.691	0.056	-	-	0.072	-	-	0.803
HCM Control Delay (s)	125.4	11.6	-	-	15.7	-	-	110.1
HCM Lane LOS	F	B	-	-	C	-	-	F
HCM 95th %tile Q(veh)	3.2	0.2	-	-	0.2	-	-	4.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	163.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	186	299	494	0	110	341	37	0	208	175	148
Future Vol, veh/h	0	186	299	494	0	110	341	37	0	208	175	148
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	200	322	531	0	118	367	40	0	224	188	159
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	3
HCM Control Delay	200.5	143.5	108.2
HCM LOS	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	54%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	46%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	208	323	186	299	494	110	341	37	43	367	124
LT Vol	208	0	186	0	0	110	0	0	43	0	0
Through Vol	0	175	0	299	0	0	341	0	0	367	0
RT Vol	0	148	0	0	494	0	0	37	0	0	124
Lane Flow Rate	224	347	200	322	531	118	367	40	46	395	133
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.802	1.166	0.673	1.038	1.612	0.434	1.295	0.133	0.169	1.391	0.444
Departure Headway (Hd)	13.559	12.738	13.609	13.08	12.339	14.332	13.805	13.068	14.215	13.695	12.967
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	268	288	268	280	297	253	268	276	254	268	280
Service Time	11.259	10.438	11.309	10.78	10.039	12.032	11.505	10.768	11.915	11.395	10.667
HCM Lane V/C Ratio	0.836	1.205	0.746	1.15	1.788	0.466	1.369	0.145	0.181	1.474	0.475
HCM Control Delay	54.6	142.7	40.4	103	319.8	27.6	194.5	17.8	19.8	232.1	25.6
HCM Lane LOS	F	F	E	F	F	D	F	C	C	F	D
HCM 95th-tile Q	6.2	14.4	4.4	11	28.5	2.1	17	0.5	0.6	19.8	2.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	43	367	124
Future Vol, veh/h	0	43	367	124
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	46	395	133
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	167.1
HCM LOS	F

Intersection	
Intersection Delay, s/veh	643.4
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	186	1060	274	0	503	768	37	0	202	175	448
Future Vol, veh/h	0	186	1060	274	0	503	768	37	0	202	175	448
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	200	1140	295	0	541	826	40	0	217	188	482
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	993.6	723.7	194.4
HCM LOS	F	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	202	175	448	186	1060	274	503	768	37	43	367
LT Vol	202	0	0	186	0	0	503	0	0	43	0
Through Vol	0	175	0	0	1060	0	0	768	0	0	367
RT Vol	0	0	448	0	0	274	0	0	37	0	0
Lane Flow Rate	217	188	482	200	1140	295	541	826	40	46	395
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.809	0.675	1.635	0.734	4.024	0.983	2.001	2.943	0.134	0.175	1.438
Departure Headway (Hd)	11.403	10.903	10.203	13.82	13.32	12.62	13.501	13.001	12.301	2.17	1.67
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	319	333	361	264	285	289	276	289	293	1660	2163
Service Time	9.103	8.603	7.903	11.52	11.02	10.32	11.201	10.701	10.001	-0.13	-0.63
HCM Lane V/C Ratio	0.68	0.565	1.335	0.758	4	1.021	1.96	2.858	0.137	0.028	0.183
HCM Control Delay	48.6	33.5	322.9	46.9	1394.3	86.3	492.2	909.3	16.9	5.3	206.8
HCM Lane LOS	E	D	F	E	F	F	F	F	C	A	F
HCM 95th-tile Q	6.7	4.6	34.3	5.2	106	10	38.6	71.5	0.5	0.6	127.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	43	367	124
Future Vol, veh/h	0	43	367	124
Peak Hour Factor	0.92	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	46	395	133
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	143.6
HCM LOS	F

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	744	886	1439	730	1090	1978	
Future Volume (vph)	744	886	1439	730	1090	1978	
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA	
Protected Phases	3	1	2	3	1	6	8
Permitted Phases		8		2			
Detector Phase	3	1	2	3	1	6	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0	36.3
Total Split (s)	36.3	37.0	46.7	36.3	37.0	83.7	36.3
Total Split (%)	30.3%	30.8%	38.9%	30.3%	30.8%	69.8%	30%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0	
Lead/Lag		Lead	Lag		Lead		
Lead-Lag Optimize?		Yes	Yes		Yes		
Recall Mode	None	None	Min	None	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	744	0	886	0	1439	730	1090	1978	0
Future Volume (veh/h)	0	0	0	744	0	886	0	1439	730	1090	1978	0
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	0	1900	0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h				836	0	954	0	1617	820	1225	2222	0
Adj No. of Lanes				1	0	1	0	1	1	1	1	0
Peak Hour Factor				0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				466	0	846	0	659	976	481	1243	0
Arrive On Green				0.26	0.00	0.26	0.00	0.35	0.35	0.27	0.65	0.00
Sat Flow, veh/h				1810	0	1615	0	1900	1615	1810	1900	0
Grp Volume(v), veh/h				836	0	954	0	1617	820	1225	2222	0
Grp Sat Flow(s),veh/h/ln				1810	0	1615	0	1900	1615	1810	1900	0
Q Serve(g_s), s				31.0	0.0	31.0	0.0	41.7	41.7	32.0	78.7	0.0
Cycle Q Clear(g_c), s				31.0	0.0	31.0	0.0	41.7	41.7	32.0	78.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h				466	0	846	0	659	976	481	1243	0
V/C Ratio(X)				1.79	0.00	1.13	0.00	2.46	0.84	2.54	1.79	0.00
Avail Cap(c_a), veh/h				466	0	846	0	659	976	481	1243	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				44.6	0.0	28.7	0.0	39.3	19.1	44.2	20.8	0.0
Incr Delay (d2), s/veh				365.3	0.0	72.5	0.0	659.4	6.8	701.4	357.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				62.7	0.0	44.8	0.0	142.4	23.6	109.7	164.2	0.0
LnGrp Delay(d),s/veh				410.0	0.0	101.1	0.0	698.7	25.9	745.5	378.5	0.0
LnGrp LOS				F		F		F	C	F	F	
Approach Vol, veh/h					1790			2437			3447	
Approach Delay, s/veh					245.4			472.3			508.9	
Approach LOS					F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	37.0	47.0				84.0		36.3
Change Period (Y+Rc), s	5.0	5.3				* 5.3		5.3
Max Green Setting (Gmax), s	32.0	41.4				* 79		31.0
Max Q Clear Time (g_c+I1), s	34.0	43.7				80.7		33.0
Green Ext Time (p_c), s	0.0	0.0				0.0		0.0

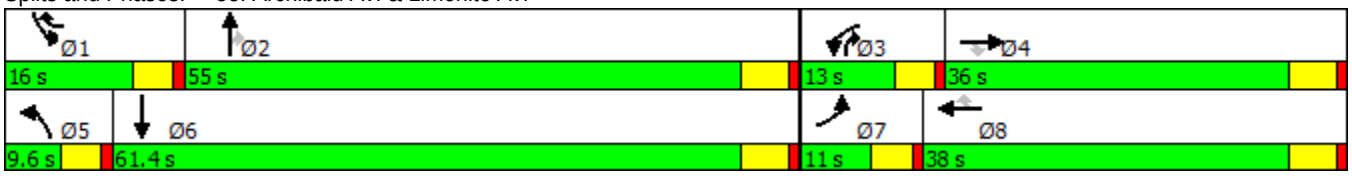
Intersection Summary		
HCM 2010 Ctrl Delay		435.8
HCM 2010 LOS		F

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	285	760	108	444	618	1176	82	1439	380	703	1978
Future Volume (vph)	285	760	108	444	618	1176	82	1439	380	703	1978
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	1	5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	1	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0
Minimum Split (s)	9.6	33.3	33.3	9.6	33.3	9.6	9.6	46.3	9.6	9.6	46.3
Total Split (s)	11.0	36.0	36.0	13.0	38.0	16.0	9.6	55.0	13.0	16.0	61.4
Total Split (%)	9.2%	30.0%	30.0%	10.8%	31.7%	13.3%	8.0%	45.8%	10.8%	13.3%	51.2%
Yellow Time (s)	3.6	4.3	4.3	3.6	4.3	3.6	3.6	4.3	3.6	3.6	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.3	5.3	4.6	5.3	4.6	4.6	5.3	4.6	4.6	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	760	108	444	618	1176	82	1439	380	703	1978	237
Future Volume (veh/h)	285	760	108	444	618	1176	82	1439	380	703	1978	237
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	310	826	117	499	672	1279	89	1617	427	790	2222	258
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	97	486	413	127	518	594	75	787	782	172	781	91
Arrive On Green	0.05	0.26	0.26	0.07	0.27	0.27	0.04	0.41	0.41	0.09	0.47	0.47
Sat Flow, veh/h	1810	1900	1615	1810	1900	1615	1810	1900	1615	1810	1672	194
Grp Volume(v), veh/h	310	826	117	499	672	1279	89	1617	427	790	0	2480
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1810	1900	1615	1810	1900	1615	1810	0	1866
Q Serve(g_s), s	6.4	30.7	7.0	8.4	32.7	32.7	5.0	49.7	22.2	11.4	0.0	56.1
Cycle Q Clear(g_c), s	6.4	30.7	7.0	8.4	32.7	32.7	5.0	49.7	22.2	11.4	0.0	56.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	97	486	413	127	518	594	75	787	782	172	0	872
V/C Ratio(X)	3.21	1.70	0.28	3.94	1.30	2.15	1.18	2.05	0.55	4.60	0.00	2.84
Avail Cap(c_a), veh/h	97	486	413	127	518	594	75	787	782	172	0	872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.8	44.7	35.8	55.8	43.6	38.0	57.5	35.2	21.7	54.3	0.0	32.0
Incr Delay (d2), s/veh	1021.9	323.4	0.4	1341.5	147.8	525.3	160.3	479.1	0.9	1631.3	0.0	832.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.6	59.7	3.1	51.4	38.4	106.2	5.8	130.7	10.0	83.6	0.0	230.6
LnGrp Delay(d),s/veh	1078.7	368.1	36.2	1397.3	191.5	563.3	217.8	514.2	22.6	1685.6	0.0	864.6
LnGrp LOS	F	F	D	F	F	F	F	F	C	F		F
Approach Vol, veh/h		1253			2450			2133			3270	
Approach Delay, s/veh		512.9			631.2			403.5			1062.9	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	55.0	13.0	36.0	9.6	61.4	11.0	38.0
Change Period (Y+Rc), s	4.6	5.3	4.6	5.3	4.6	5.3	4.6	5.3
Max Green Setting (Gmax), s	11.4	49.7	8.4	30.7	5.0	56.1	6.4	32.7
Max Q Clear Time (g_c+I1), s	13.4	51.7	10.4	32.7	7.0	58.1	8.4	34.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

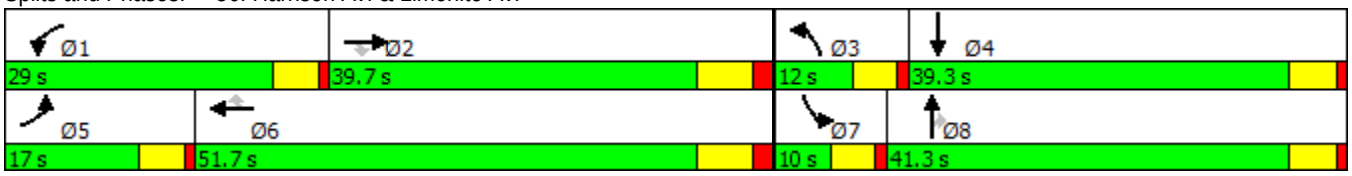
Intersection Summary	
HCM 2010 Ctrl Delay	716.6
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	78	1932	210	251	1953	93	135	58	157	109	109
Future Volume (vph)	78	1932	210	251	1953	93	135	58	157	109	109
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	17.0	39.7	39.7	29.0	51.7	51.7	12.0	41.3	41.3	10.0	39.3
Total Split (%)	14.2%	33.1%	33.1%	24.2%	43.1%	43.1%	10.0%	34.4%	34.4%	8.3%	32.8%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 102.5
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1932	210	251	1953	93	135	58	157	109	109	144
Future Volume (veh/h)	78	1932	210	251	1953	93	135	58	157	109	109	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	2147	232	279	2170	103	150	64	145	121	121	153
Adj No. of Lanes	1	3	1	1	2	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	111	1754	535	312	1620	725	127	409	343	91	147	186
Arrive On Green	0.06	0.34	0.34	0.17	0.45	0.45	0.07	0.22	0.22	0.05	0.20	0.20
Sat Flow, veh/h	1810	5187	1581	1810	3610	1615	1810	1900	1592	1810	754	953
Grp Volume(v), veh/h	87	2147	232	279	2170	103	150	64	145	121	0	274
Grp Sat Flow(s),veh/h/ln	1810	1729	1581	1810	1805	1615	1810	1900	1592	1810	0	1707
Q Serve(g_s), s	4.7	33.7	11.3	15.0	44.7	3.7	7.0	2.7	7.8	5.0	0.0	15.3
Cycle Q Clear(g_c), s	4.7	33.7	11.3	15.0	44.7	3.7	7.0	2.7	7.8	5.0	0.0	15.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	111	1754	535	312	1620	725	127	409	343	91	0	333
V/C Ratio(X)	0.78	1.22	0.43	0.89	1.34	0.14	1.18	0.16	0.42	1.33	0.00	0.82
Avail Cap(c_a), veh/h	218	1754	535	436	1620	725	127	687	576	91	0	583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.1	33.0	25.6	40.3	27.4	16.2	46.3	31.7	33.7	47.3	0.0	38.4
Incr Delay (d2), s/veh	4.4	106.1	0.6	13.0	156.9	0.1	135.9	0.2	0.8	206.7	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	33.2	5.0	8.6	57.4	1.7	8.3	1.4	3.5	7.7	0.0	7.7
LnGrp Delay(d),s/veh	50.5	139.1	26.1	53.3	184.3	16.2	182.2	31.9	34.6	254.0	0.0	43.5
LnGrp LOS	D	F	C	D	F	B	F	C	C	F		D
Approach Vol, veh/h		2466			2552			359			395	
Approach Delay, s/veh		125.3			163.2			95.8			108.0	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.2	40.7	12.0	24.7	11.1	51.7	10.0	26.7
Change Period (Y+Rc), s	5.0	7.0	5.0	5.3	5.0	7.0	5.0	5.3
Max Green Setting (Gmax), s	24.0	32.7	7.0	34.0	12.0	44.7	5.0	36.0
Max Q Clear Time (g_c+I1), s	17.0	35.7	9.0	17.3	6.7	46.7	7.0	9.8
Green Ext Time (p_c), s	0.1	0.0	0.0	2.1	0.0	0.0	0.0	2.4

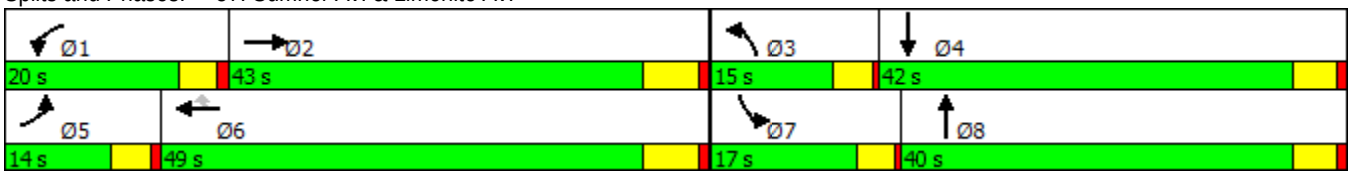
Intersection Summary	
HCM 2010 Ctrl Delay	139.1
HCM 2010 LOS	F

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	114	1617	489	1879	66	422	79	93	166
Future Volume (vph)	114	1617	489	1879	66	422	79	93	166
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	1	6		3	8	7	4
Permitted Phases					6				
Detector Phase	5	2	1	6	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	14.0	43.0	20.0	49.0	49.0	15.0	40.0	17.0	42.0
Total Split (%)	11.7%	35.8%	16.7%	40.8%	40.8%	12.5%	33.3%	14.2%	35.0%
Yellow Time (s)	3.5	5.0	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.2
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	1617	541	489	1879	66	422	79	321	93	166	88
Future Volume (veh/h)	114	1617	541	489	1879	66	422	79	321	93	166	88
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	118	1667	552	504	1937	47	435	81	257	96	171	64
Adj No. of Lanes	2	3	0	2	3	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	181	1452	467	550	2483	773	201	371	330	122	419	151
Arrive On Green	0.05	0.37	0.37	0.16	0.48	0.48	0.11	0.21	0.21	0.07	0.16	0.16
Sat Flow, veh/h	3510	3885	1250	3510	5187	1614	1810	1805	1608	1810	2589	931
Grp Volume(v), veh/h	118	1478	741	504	1937	47	435	81	257	96	117	118
Grp Sat Flow(s),veh/h/ln	1755	1729	1677	1755	1729	1614	1810	1805	1608	1810	1805	1715
Q Serve(g_s), s	3.3	37.0	37.0	14.0	30.8	1.5	11.0	3.7	15.0	5.2	5.8	6.1
Cycle Q Clear(g_c), s	3.3	37.0	37.0	14.0	30.8	1.5	11.0	3.7	15.0	5.2	5.8	6.1
Prop In Lane	1.00		0.75	1.00		1.00	1.00		1.00	1.00		0.54
Lane Grp Cap(c), veh/h	181	1292	627	550	2483	773	201	371	330	122	292	277
V/C Ratio(X)	0.65	1.14	1.18	0.92	0.78	0.06	2.16	0.22	0.78	0.79	0.40	0.43
Avail Cap(c_a), veh/h	337	1292	627	550	2483	773	201	638	568	238	675	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.1	31.0	31.0	41.1	21.5	13.9	44.0	32.7	37.2	45.5	37.2	37.4
Incr Delay (d2), s/veh	1.5	74.5	97.4	20.0	1.7	0.0	539.8	0.2	3.0	4.1	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	31.0	34.0	8.3	14.9	0.7	35.6	1.9	6.9	2.7	2.9	3.0
LnGrp Delay(d),s/veh	47.6	105.5	128.4	61.1	23.1	13.9	583.8	33.0	40.2	49.6	37.9	38.1
LnGrp LOS	D	F	F	E	C	B	F	C	D	D	D	D
Approach Vol, veh/h		2337			2488			773			331	
Approach Delay, s/veh		109.8			30.6			345.4			41.4	
Approach LOS		F			C			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	43.0	15.0	21.0	9.6	53.4	10.7	25.3
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	15.5	37.0	11.0	37.0	9.5	43.0	13.0	35.0
Max Q Clear Time (g_c+I1), s	16.0	39.0	13.0	8.1	5.3	32.8	7.2	17.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.7	0.0	10.1	0.0	2.4

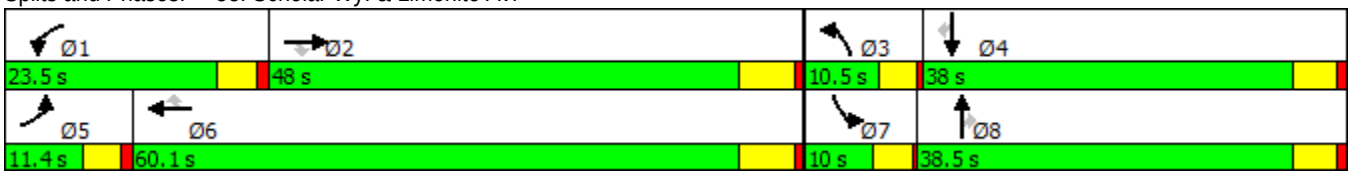
Intersection Summary	
HCM 2010 Ctrl Delay	103.5
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1566	197	214	2064	47	271	34	186	34	95	66
Future Volume (vph)	65	1566	197	214	2064	47	271	34	186	34	95	66
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	11.4	48.0	48.0	23.5	60.1	60.1	10.5	38.5	38.5	10.0	38.0	38.0
Total Split (%)	9.5%	40.0%	40.0%	19.6%	50.1%	50.1%	8.8%	32.1%	32.1%	8.3%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.2
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1566	197	214	2064	47	271	34	186	34	95	66
Future Volume (veh/h)	65	1566	197	214	2064	47	271	34	186	34	95	66
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	1598	199	218	2106	48	277	35	142	35	97	64
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	85	1795	791	253	2130	931	128	236	200	47	286	125
Arrive On Green	0.05	0.50	0.50	0.14	0.59	0.59	0.07	0.12	0.12	0.03	0.08	0.08
Sat Flow, veh/h	1810	3610	1592	1810	3610	1578	1810	1900	1611	1810	3610	1585
Grp Volume(v), veh/h	66	1598	199	218	2106	48	277	35	142	35	97	64
Grp Sat Flow(s),veh/h/ln	1810	1805	1592	1810	1805	1578	1810	1900	1611	1810	1805	1585
Q Serve(g_s), s	3.3	36.6	6.6	10.8	52.6	1.2	6.5	1.5	7.8	1.8	2.3	3.6
Cycle Q Clear(g_c), s	3.3	36.6	6.6	10.8	52.6	1.2	6.5	1.5	7.8	1.8	2.3	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	1795	791	253	2130	931	128	236	200	47	286	125
V/C Ratio(X)	0.77	0.89	0.25	0.86	0.99	0.05	2.16	0.15	0.71	0.75	0.34	0.51
Avail Cap(c_a), veh/h	136	1795	791	375	2130	931	128	694	589	118	1299	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	20.8	13.2	38.5	18.5	7.9	42.6	35.8	38.5	44.4	39.9	40.5
Incr Delay (d2), s/veh	5.5	6.0	0.2	8.8	16.8	0.0	546.6	0.2	3.4	8.7	0.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	19.7	2.9	6.0	30.7	0.5	22.7	0.8	3.6	1.0	1.2	1.6
LnGrp Delay(d),s/veh	48.7	26.8	13.4	47.3	35.3	8.0	589.1	36.0	42.0	53.0	40.5	42.9
LnGrp LOS	D	C	B	D	D	A	F	D	D	D	D	D
Approach Vol, veh/h		1863			2372			454			196	
Approach Delay, s/veh		26.2			35.9			375.4			43.5	
Approach LOS		C			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	51.6	10.5	12.3	8.8	60.1	6.4	16.4
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	19.0	42.0	6.5	33.0	6.9	54.1	6.0	33.5
Max Q Clear Time (g_c+I1), s	12.8	38.6	8.5	5.6	5.3	54.6	3.8	9.8
Green Ext Time (p_c), s	0.1	3.4	0.0	1.0	0.0	0.0	0.0	1.0

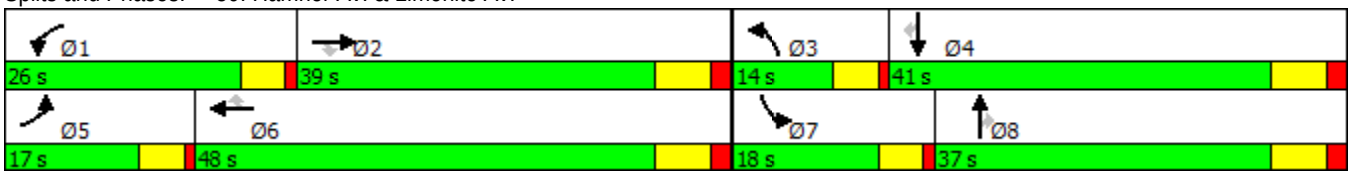
Intersection Summary	
HCM 2010 Ctrl Delay	64.0
HCM 2010 LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	1111	185	362	1380	648	237	1010	363	633	983	413
Future Volume (vph)	332	1111	185	362	1380	648	237	1010	363	633	983	413
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	5.0	6.0	6.0	5.0	6.0	6.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0	10.0	37.0	37.0
Total Split (s)	17.0	39.0	39.0	26.0	48.0	48.0	14.0	37.0	37.0	18.0	41.0	41.0
Total Split (%)	14.2%	32.5%	32.5%	21.7%	40.0%	40.0%	11.7%	30.8%	30.8%	15.0%	34.2%	34.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	332	1111	185	362	1380	648	237	1010	363	633	983	413
Future Volume (veh/h)	332	1111	185	362	1380	648	237	1010	363	633	983	413
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	339	1134	170	369	1408	592	242	1031	293	646	1003	380
Adj No. of Lanes	2	3	1	2	2	1	2	3	1	2	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	351	1658	504	429	1233	550	263	1297	393	380	1023	457
Arrive On Green	0.10	0.32	0.32	0.12	0.34	0.34	0.08	0.25	0.25	0.11	0.28	0.28
Sat Flow, veh/h	3510	5187	1579	3510	3610	1611	3510	5187	1572	3510	3610	1612
Grp Volume(v), veh/h	339	1134	170	369	1408	592	242	1031	293	646	1003	380
Grp Sat Flow(s),veh/h/ln	1755	1729	1579	1755	1805	1611	1755	1729	1572	1755	1805	1612
Q Serve(g_s), s	11.5	22.8	9.9	12.4	41.0	41.0	8.2	22.3	20.6	13.0	33.1	26.5
Cycle Q Clear(g_c), s	11.5	22.8	9.9	12.4	41.0	41.0	8.2	22.3	20.6	13.0	33.1	26.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	351	1658	504	429	1233	550	263	1297	393	380	1023	457
V/C Ratio(X)	0.97	0.68	0.34	0.86	1.14	1.08	0.92	0.80	0.75	1.70	0.98	0.83
Avail Cap(c_a), veh/h	351	1658	504	614	1233	550	263	1297	393	380	1023	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	35.6	31.1	51.7	39.5	39.5	55.1	42.1	41.5	53.5	42.7	40.3
Incr Delay (d2), s/veh	38.6	1.5	0.8	6.3	73.8	60.3	34.1	4.0	9.0	325.5	23.6	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	11.2	4.4	6.4	33.0	27.4	5.2	11.2	9.9	23.5	19.8	13.5
LnGrp Delay(d),s/veh	92.4	37.1	32.0	57.9	113.3	99.8	89.3	46.1	50.5	379.0	66.2	53.9
LnGrp LOS	F	D	C	E	F	F	F	D	D	F	E	D
Approach Vol, veh/h		1643			2369			1566			2029	
Approach Delay, s/veh		48.0			101.3			53.6			163.5	
Approach LOS		D			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	45.3	14.0	41.0	17.0	48.0	18.0	37.0
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	21.0	32.0	9.0	34.0	12.0	41.0	13.0	30.0
Max Q Clear Time (g_c+I1), s	14.4	24.8	10.2	35.1	13.5	43.0	15.0	24.3
Green Ext Time (p_c), s	0.3	7.1	0.0	0.0	0.0	0.0	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	96.6
HCM 2010 LOS	F

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1643	725	913	2218	517	0	503
Future Volume (vph)	1643	725	913	2218	517	0	503
Turn Type	NA	Perm	Prot	NA	Split	NA	Perm
Protected Phases	2		1	6	4	4	
Permitted Phases		2					4
Detector Phase	2	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	10.0	36.5	23.5	23.5	23.5
Total Split (s)	56.0	56.0	23.0	79.0	31.0	31.0	31.0
Total Split (%)	50.9%	50.9%	20.9%	71.8%	28.2%	28.2%	28.2%
Yellow Time (s)	4.5	4.5	4.0	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	Min	Min	Min

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 50 (45%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1643	725	913	2218	0	0	0	0	517	0	503
Future Volume (veh/h)	0	1643	725	913	2218	0	0	0	0	517	0	503
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1900	0				1900	1900	1900
Adj Flow Rate, veh/h	0	1694	747	941	2287	0				668	0	288
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1751	783	590	2505	0				745	0	333
Arrive On Green	0.00	0.48	0.48	0.22	0.92	0.00				0.21	0.00	0.21
Sat Flow, veh/h	0	3705	1615	3510	3705	0				3619	0	1615
Grp Volume(v), veh/h	0	1694	747	941	2287	0				668	0	288
Grp Sat Flow(s),veh/h/ln	0	1805	1615	1755	1805	0				1810	0	1615
Q Serve(g_s), s	0.0	50.1	48.8	18.5	34.1	0.0				19.8	0.0	19.0
Cycle Q Clear(g_c), s	0.0	50.1	48.8	18.5	34.1	0.0				19.8	0.0	19.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1751	783	590	2505	0				745	0	333
V/C Ratio(X)	0.00	0.97	0.95	1.59	0.91	0.00				0.90	0.00	0.87
Avail Cap(c_a), veh/h	0	1751	783	590	2505	0				839	0	374
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.11	0.11	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.5	27.1	42.7	2.6	0.0				42.5	0.0	42.2
Incr Delay (d2), s/veh	0.0	2.8	4.2	268.0	0.7	0.0				10.6	0.0	15.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	25.4	22.5	30.9	14.9	0.0				10.9	0.0	9.9
LnGrp Delay(d),s/veh	0.0	30.2	31.4	310.7	3.3	0.0				53.1	0.0	58.1
LnGrp LOS		C	C	F	A					D		E
Approach Vol, veh/h		2441			3228						956	
Approach Delay, s/veh		30.6			92.9						54.6	
Approach LOS		C			F						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	23.0	58.8		28.2		81.8		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	18.5	50.5		25.5		73.5		
Max Q Clear Time (g_c+I1), s	20.5	52.1		21.8		36.1		
Green Ext Time (p_c), s	0.0	0.0		0.9		33.2		

Intersection Summary	
HCM 2010 Ctrl Delay	64.4
HCM 2010 LOS	E

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	240	1920	2523	480	608	0	910
Future Volume (vph)	240	1920	2523	480	608	0	910
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	26.0	72.0	46.0	46.0	38.0	38.0	38.0
Total Split (%)	23.6%	65.5%	41.8%	41.8%	34.5%	34.5%	34.5%
Yellow Time (s)	4.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	1920	0	0	2523	480	608	0	910	0	0	0
Future Volume (veh/h)	240	1920	0	0	2523	480	608	0	910	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	242	1939	0	0	2548	456	839	0	446			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	319	2193	0	0	1717	758	1059	0	472			
Arrive On Green	0.09	0.61	0.00	0.00	0.48	0.48	0.29	0.00	0.29			
Sat Flow, veh/h	3510	3705	0	0	3705	1594	3619	0	1613			
Grp Volume(v), veh/h	242	1939	0	0	2548	456	839	0	446			
Grp Sat Flow(s),veh/h/ln	1755	1805	0	0	1805	1594	1810	0	1613			
Q Serve(g_s), s	7.4	50.1	0.0	0.0	52.3	23.1	23.5	0.0	29.7			
Cycle Q Clear(g_c), s	7.4	50.1	0.0	0.0	52.3	23.1	23.5	0.0	29.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	319	2193	0	0	1717	758	1059	0	472			
V/C Ratio(X)	0.76	0.88	0.00	0.00	1.48	0.60	0.79	0.00	0.94			
Avail Cap(c_a), veh/h	686	2193	0	0	1717	758	1069	0	477			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.8	18.3	0.0	0.0	28.8	21.2	35.8	0.0	38.0			
Incr Delay (d2), s/veh	0.3	0.6	0.0	0.0	220.9	3.5	4.1	0.0	27.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.6	24.9	0.0	0.0	78.7	10.9	12.4	0.0	16.9			
LnGrp Delay(d),s/veh	49.2	18.9	0.0	0.0	249.8	24.7	39.9	0.0	65.8			
LnGrp LOS	D	B			F	C	D		E			
Approach Vol, veh/h		2181			3004			1285				
Approach Delay, s/veh		22.2			215.6			48.9				
Approach LOS		C			F			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		72.3			14.5	57.8		37.7
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		66.5			21.5	40.5		32.5
Max Q Clear Time (g_c+I1), s		52.1			9.4	54.3		31.7
Green Ext Time (p_c), s		14.0			0.6	0.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	117.3
HCM 2010 LOS	F

Notes

APPENDIX 9.3:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

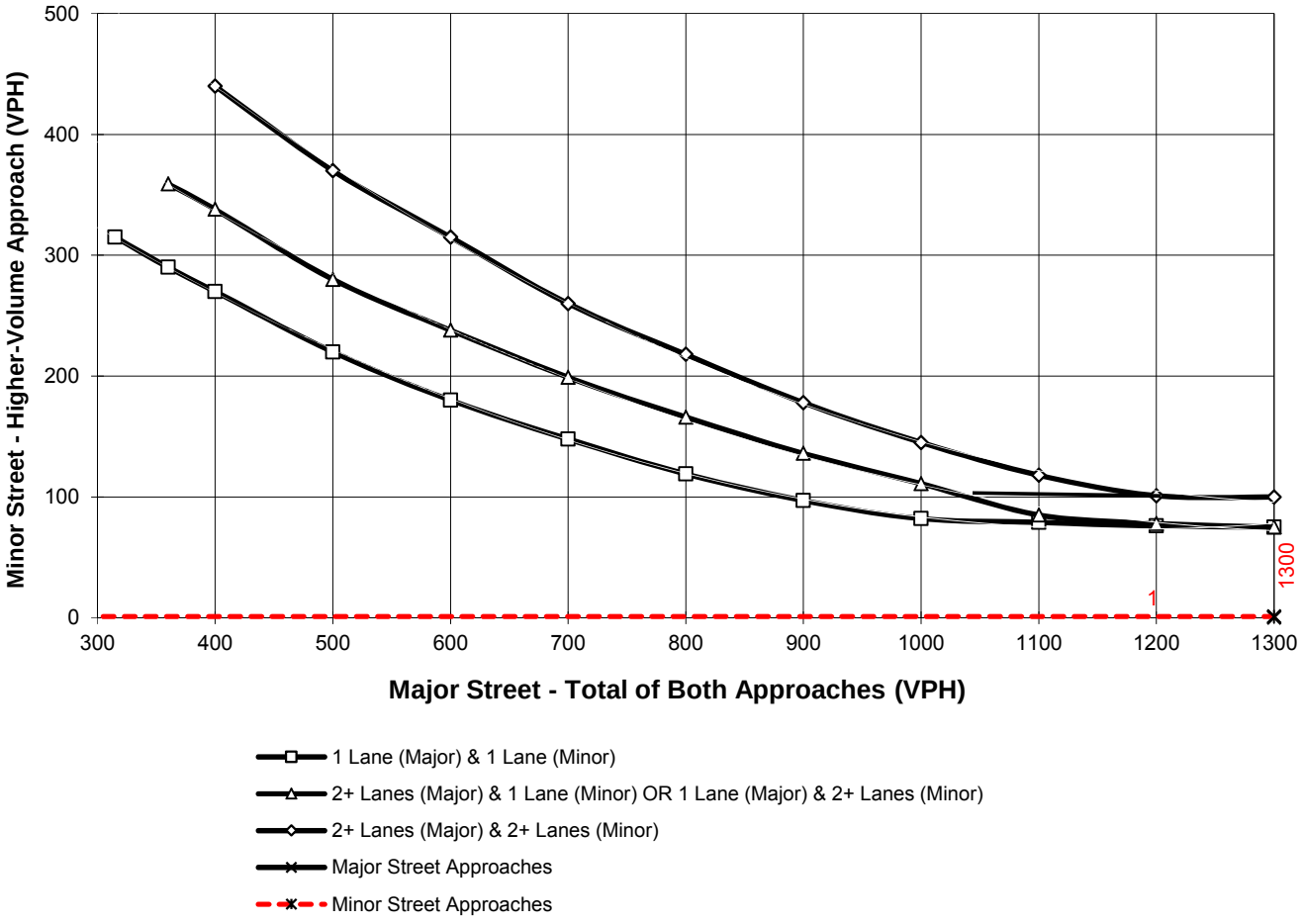
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Horizon Year (2040) Without Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Kimball Av.** Total of Both Approaches (VPH) = **1614**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Fire Station Dwy.** High Volume Approach (VPH) = **1**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 9.4:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM				
				TRAFFIC CONDITIONS		**2040 WP**	
				CALC	CHS	DATE	09/06/16
Jurisdiction:	**City of Chino**			CHK	CHS	DATE	09/06/16
Major Street:	**Mayhew Av.**			Critical Approach Speed (Major)		35	mph
Minor Street:	**Driveway 4**			Critical Approach Speed (Minor)		15	mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **2,419** vpd

Minor Street Future ADT = **754** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,419**	*1* **754**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,419**	*1* **754**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 30% **B** 20%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2040 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 5				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,030** vpd Minor Street Future ADT = **136** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,030**	*1* **136**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,030**	*1* **136**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 6% **B** 11%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2040 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 6				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,986** vpd Minor Street Future ADT = **100** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,986**	*1* **100**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic					
Satisfied	Not Satisfied	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,986**	*1* **100**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied	2 CONDITIONS 80%		2 CONDITIONS 80%	
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		**2040 WP**
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 7**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,016** vpd Minor Street Future ADT = **60** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,016**	*1* **60**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,016**	*1* **60**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 3% **B** 5%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2040 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 8				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,929** vpd Minor Street Future ADT = **301** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,929**	*1* **301**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,929**	*1* **301**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 13% **B** 16%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		**2040 WP**
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 9**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,737** vpd

Minor Street Future ADT = **225** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,737**	*1* **225**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,737**	*1* **225**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 9%	**B** 14%			

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		**2040 WP**
				CALC CHS	DATE	09/06/16
Jurisdiction: **City of Chino**				CHK CHS	DATE	09/06/16
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 10**				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,504** vpd Minor Street Future ADT = **248** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
XX / Satisfied; Not Satisfied XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **1,504** / *1* **248**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied; Not Satisfied XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **1,504** / *1* **248**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied; Not Satisfied XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. **A** 10% **B** 13%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2040 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 11				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,361** vpd Minor Street Future ADT = **106** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,361**	*1* **106**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,361**	*1* **106**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 9%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2040 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 12				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **1,496** vpd

Minor Street Future ADT = **361** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,496**	*1* **361**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2 +*	9,600	6,720	3,200	2,240
1	*2 +*	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,496**	*1* **361**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2 +*	14,400	10,080	1,600	1,120
1	*2 +*	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 15% **B** 12%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2040 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Mayhew Av.				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 13				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **1,615** vpd Minor Street Future ADT = **93** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …… [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,615**	*1* **93**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **1,615**	*1* **93**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 4% **B** 8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2040 WP
				CALC	CHS	DATE	09/06/16
Jurisdiction:	City of Chino			CHK	CHS	DATE	09/06/16
Major Street:	Bickmore Av.				Critical Approach Speed (Major)		40 mph
Minor Street:	Mayhew Av.				Critical Approach Speed (Minor)		35 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **6,997** vpd Minor Street Future ADT = **792** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
CONDITION A - Minimum Vehicular Volume	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied: XX / Not Satisfied: XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **6,997** / 1 **792**	8,000	5,600	2,400	1,680
2 + / 1	9,600	6,720	2,400	1,680
2 + / 2 +	9,600	6,720	3,200	2,240
1 / 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **6,997** / 1 **792**	12,000	8,400	1,200	850
2 + / 1	14,400	10,080	1,200	850
2 + / 2 +	14,400	10,080	1,600	1,120
1 / 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 33% B: 58%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2040 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Street B				Critical Approach Speed (Major)		25 mph
Minor Street: Driveway 15				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **3,362** vpd Minor Street Future ADT = **276** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **3,362**	*1* **276**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **3,362**	*1* **276**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 12% **B** 23%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2040 WP
				CALC CHS	DATE	09/06/16
Jurisdiction: City of Chino				CHK CHS	DATE	09/06/16
Major Street: Street B				Critical Approach Speed (Major)		25 mph
Minor Street: Driveway 16				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **2,826** vpd Minor Street Future ADT = **30** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,826**	*1* **30**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,826**	*1* **30**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 1% **B** 3%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		2040 WP
				CALC	CHS	DATE	06/13/17
Jurisdiction:	City of Chino			CHK	CHS	DATE	06/13/17
Major Street:	Street B/Driveway 17				Critical Approach Speed (Major)		25 mph
Minor Street:	Driveway 18				Critical Approach Speed (Minor)		15 mph

Major Street Approach Lanes = **1** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **2,578** vpd

Minor Street Future ADT = **216** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……..

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,578**	*1* **216**	8,000	5,600	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **2,578**	*1* **216**	12,000	8,400	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 9% **B** 18%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 9.5:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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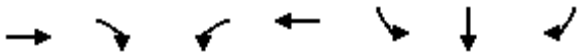


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1484	530	29	1293	388	396	401
v/c Ratio	0.51	0.53	0.20	0.70	0.72	0.68	0.65
Control Delay	13.9	4.0	28.5	9.2	27.0	24.5	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	4.0	28.5	9.2	27.0	24.5	17.6
Queue Length 50th (ft)	91	0	12	135	127	127	83
Queue Length 95th (ft)	165	57	m16	m129	#249	#221	168
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2886	999	142	1835	541	582	617
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.53	0.20	0.70	0.72	0.68	0.65

Intersection Summary

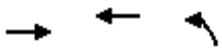
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	767	1408	813	455	354	698
v/c Ratio	1.47	0.58	0.53	0.60	1.96	1.60
Control Delay	245.0	6.9	14.4	12.8	471.6	303.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	245.0	6.9	14.4	12.8	471.6	303.8
Queue Length 50th (ft)	~213	68	109	78	~225	~195
Queue Length 95th (ft)	#307	182	155	161	#380	#298
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	522	2436	1534	758	181	436
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.47	0.58	0.53	0.60	1.96	1.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

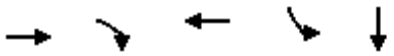
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1552	899	610
v/c Ratio	0.46	0.27	1.22dr
Control Delay	4.5	7.5	38.7
Queue Delay	0.0	0.0	0.0
Total Delay	4.5	7.5	38.7
Queue Length 50th (ft)	63	71	161
Queue Length 95th (ft)	84	100	182
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3364	3364	1095
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.46	0.27	0.56

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	2278	119	414	368	632
v/c Ratio	0.76	0.12	0.14	0.69	0.87
Control Delay	18.9	3.7	7.6	31.4	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	3.7	7.6	31.4	26.3
Queue Length 50th (ft)	332	2	25	187	186
Queue Length 95th (ft)	433	24	36	186	189
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	3008	959	3008	774	903
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.12	0.14	0.48	0.70

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	377	373	345	572	1580	1537	856
v/c Ratio	0.94	0.91	0.78	1.42	0.69	1.22	0.93
Control Delay	66.4	59.9	37.0	215.8	27.1	133.6	27.4
Queue Delay	0.0	0.0	0.0	0.0	48.8	0.2	0.0
Total Delay	66.4	59.9	37.0	215.8	75.9	133.8	27.4
Queue Length 50th (ft)	218	215	145	~459	518	~569	166
Queue Length 95th (ft)	#394	#396	#282	m#341	m406	#704	#463
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	415	422	455	403	2295	1263	918
Starvation Cap Reductn	0	0	0	0	1045	0	0
Spillback Cap Reductn	0	0	0	0	0	52	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.88	0.76	1.42	1.26	1.27	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	405	468	1679	816	333	1843
v/c Ratio	0.94	0.99	1.31	0.86	0.89	0.83
Control Delay	63.9	69.4	174.9	17.8	42.9	4.7
Queue Delay	133.8	67.9	0.4	0.0	0.0	25.3
Total Delay	197.8	137.2	175.3	17.8	42.9	30.0
Queue Length 50th (ft)	236	238	~671	104	137	62
Queue Length 95th (ft)	#423	#454	#807	#386	m122	m67
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	433	471	1278	950	399	2226
Starvation Cap Reductn	0	0	0	0	0	465
Spillback Cap Reductn	415	403	110	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	22.50	6.88	1.44	0.86	0.83	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	550	342	399	2204	244	981
v/c Ratio	0.41	0.42	0.88	0.92	0.29	1.12
Control Delay	54.8	26.0	40.7	13.2	35.7	84.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	26.0	40.7	13.2	35.7	84.7
Queue Length 50th (ft)	231	129	192	542	77	~508
Queue Length 95th (ft)	m224	m122	m125	m105	113	#764
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1329	810	548	2391	848	878
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.42	0.73	0.92	0.29	1.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

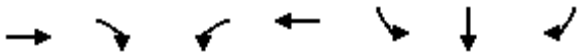
Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1162	499	743	78	265	164	165	70
v/c Ratio	1.23	0.98	0.34	1.00	0.79	0.66	0.62	0.19
Control Delay	151.0	70.2	6.2	159.5	23.8	59.4	56.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	151.0	70.2	6.2	159.5	23.8	59.4	56.7	1.1
Queue Length 50th (ft)	~587	341	48	62	0	128	128	0
Queue Length 95th (ft)	#725	m#602	m124	#166	#121	184	184	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	945	508	2172	78	340	392	418	500
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.98	0.34	1.00	0.78	0.42	0.39	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2154	864	1162	1630	252	248	226
v/c Ratio	1.40	0.94	1.22	0.61	0.92	0.78	0.75
Control Delay	210.9	34.8	128.6	11.5	84.5	50.0	46.7
Queue Delay	0.3	0.0	0.0	2.0	55.0	59.4	0.0
Total Delay	211.3	34.8	128.6	13.5	139.5	109.4	46.7
Queue Length 50th (ft)	~1072	350	~521	480	185	135	112
Queue Length 95th (ft)	#1210	#657	m#315	m250	#342	#267	#226
Internal Link Dist (ft)	2381			680		968	
Turn Bay Length (ft)			200		400		
Base Capacity (vph)	1542	919	954	2674	280	323	308
Starvation Cap Reductn	0	0	0	844	0	0	0
Spillback Cap Reductn	136	0	0	0	113	113	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.53	0.94	1.22	0.89	1.51	1.18	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

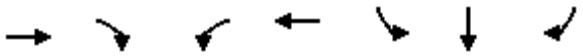
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	430	2219	2160	459	483	463	443
v/c Ratio	0.72	0.84	1.15	0.49	1.68	1.47	1.41
Control Delay	44.4	11.3	101.8	9.8	350.1	255.6	231.3
Queue Delay	0.0	46.7	0.0	0.0	0.7	0.5	0.0
Total Delay	44.4	58.0	101.8	9.8	350.8	256.1	231.3
Queue Length 50th (ft)	125	871	~946	84	~525	~449	~400
Queue Length 95th (ft)	m80	m78	#1145	185	#738	#673	#611
Internal Link Dist (ft)		680	1069			1143	
Turn Bay Length (ft)	235				450		400
Base Capacity (vph)	1002	2641	1875	944	288	316	315
Starvation Cap Reductn	0	625	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	15	14	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	1.10	1.15	0.49	1.77	1.53	1.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1563	663	125	1285	450	466	722
v/c Ratio	0.70	0.91	0.88	0.70	0.83	0.79	1.17
Control Delay	19.1	31.8	70.6	10.6	34.8	30.2	113.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	31.8	70.6	10.6	34.8	30.2	113.7
Queue Length 50th (ft)	138	135	52	113	154	156	~292
Queue Length 95th (ft)	175	#340	m#72	m124	#309	#304	#482
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2233	725	142	1835	541	592	617
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.91	0.88	0.70	0.83	0.79	1.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

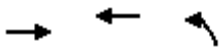
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	603	1598	853	784	300	600
v/c Ratio	1.05	0.71	0.66	1.18	1.16	1.05
Control Delay	70.2	20.1	19.2	116.8	134.2	76.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	70.2	20.1	19.2	116.8	134.2	76.8
Queue Length 50th (ft)	~127	308	133	~317	~146	~127
Queue Length 95th (ft)	m#210	378	188	#512	#290	#225
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	574	2256	1293	663	259	574
Starvation Cap Reductn	0	53	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.73	0.66	1.18	1.16	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

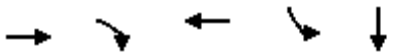
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1280	998	909
v/c Ratio	0.40	0.31	1.33dr
Control Delay	17.9	11.9	52.6
Queue Delay	0.0	0.0	0.0
Total Delay	17.9	11.9	52.6
Queue Length 50th (ft)	184	133	324
Queue Length 95th (ft)	m187	164	#410
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3172	3172	1057
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.40	0.31	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1364	114	572	430	1061
v/c Ratio	1.03	0.24	0.43	0.39	1.00
Control Delay	78.1	10.1	33.0	9.7	45.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.1	10.1	33.0	9.7	45.9
Queue Length 50th (ft)	~416	8	143	138	758
Queue Length 95th (ft)	#512	54	m179	200	#1153
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1318	476	1318	1102	1065
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.03	0.24	0.43	0.39	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	487	478	449	363	1715	1418	849
v/c Ratio	1.04	1.02	0.90	1.03	0.80	1.16	0.88
Control Delay	85.3	78.9	48.6	55.3	28.2	110.7	19.1
Queue Delay	0.0	0.0	0.0	0.0	48.5	0.4	0.0
Total Delay	85.3	78.9	48.6	55.3	76.6	111.1	19.1
Queue Length 50th (ft)	~317	~297	213	~223	561	~507	96
Queue Length 95th (ft)	#516	#520	#407	m184	m503	#640	#395
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	469	469	498	351	2145	1223	960
Starvation Cap Reductn	0	0	0	0	931	0	0
Spillback Cap Reductn	0	0	0	0	0	115	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.02	0.90	1.03	1.41	1.28	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	544	578	1410	521	283	1841
v/c Ratio	1.21	1.30	1.08	0.61	0.83	0.84
Control Delay	143.5	180.9	81.0	7.4	40.9	7.1
Queue Delay	179.1	90.6	6.9	0.0	0.0	43.6
Total Delay	322.6	271.5	87.9	7.4	40.9	50.6
Queue Length 50th (ft)	~401	~443	~494	23	119	93
Queue Length 95th (ft)	#607	#658	#647	116	m101	m84
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	451	444	1301	855	399	2186
Starvation Cap Reductn	0	0	0	0	0	500
Spillback Cap Reductn	445	426	61	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	90.67	32.11	1.14	0.61	0.71	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	918	253	439	2260	291	1353
v/c Ratio	0.69	0.34	0.97	0.95	0.34	1.71
Control Delay	40.1	11.7	64.0	14.6	36.6	344.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	11.7	64.0	14.6	36.6	344.5
Queue Length 50th (ft)	397	56	304	252	93	~1262
Queue Length 95th (ft)	465	123	m263	m188	134	#1529
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1326	753	463	2391	848	792
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.34	0.95	0.95	0.34	1.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

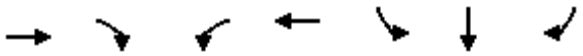
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	477	119	840	36	19	449	456	105
v/c Ratio	0.43	0.66	0.51	0.39	0.10	0.82	0.77	0.16
Control Delay	37.3	62.3	16.6	67.1	1.0	48.7	44.4	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	62.3	16.6	67.1	1.0	48.7	44.4	1.8
Queue Length 50th (ft)	164	84	191	27	0	329	327	0
Queue Length 95th (ft)	237	m99	m281	63	0	421	412	15
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1108	192	1648	96	193	669	721	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.62	0.51	0.38	0.10	0.67	0.63	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1694	708	941	2275	362	353	337
v/c Ratio	1.04	0.70	1.50	0.94	0.92	0.86	0.83
Control Delay	65.0	10.1	258.6	17.3	70.4	53.2	50.1
Queue Delay	0.0	0.0	0.0	44.6	61.7	60.7	0.0
Total Delay	65.0	10.1	258.6	61.9	132.2	113.9	50.1
Queue Length 50th (ft)	~683	89	~485	836	260	213	190
Queue Length 95th (ft)	#822	231	m#271	m466	#434	#383	#343
Internal Link Dist (ft)	2381			680		968	
Turn Bay Length (ft)			200		400		
Base Capacity (vph)	1624	1012	626	2418	413	427	421
Starvation Cap Reductn	0	0	0	387	0	0	0
Spillback Cap Reductn	0	0	0	0	259	238	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.70	1.50	1.12	2.35	1.87	0.80

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	242	1939	2548	485	531	504	487
v/c Ratio	0.59	0.89	1.58	0.59	1.05	1.04	0.98
Control Delay	34.9	29.1	290.6	16.3	92.1	85.1	70.7
Queue Delay	0.0	43.8	0.3	0.0	24.4	27.1	0.0
Total Delay	34.9	72.9	290.8	16.3	116.5	112.2	70.7
Queue Length 50th (ft)	76	778	~1350	141	~430	~382	317
Queue Length 95th (ft)	m71	m771	#1529	264	#650	#613	#550
Internal Link Dist (ft)		680	1069			1143	
Turn Bay Length (ft)	235				450		400
Base Capacity (vph)	684	2182	1612	825	506	485	495
Starvation Cap Reductn	0	410	0	0	0	0	0
Spillback Cap Reductn	0	0	124	0	222	197	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	1.09	1.71	0.59	1.87	1.75	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 9.6:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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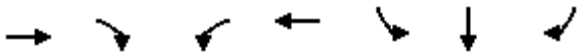


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1495	530	29	1295	408	421	401
v/c Ratio	0.52	0.53	0.20	0.71	0.75	0.72	0.65
Control Delay	13.9	4.0	28.5	9.2	29.1	26.7	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	4.0	28.5	9.2	29.1	26.7	17.6
Queue Length 50th (ft)	92	0	12	135	135	137	83
Queue Length 95th (ft)	166	57	m16	m129	#269	#265	168
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2886	999	142	1835	541	581	617
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.53	0.20	0.71	0.75	0.72	0.65

Intersection Summary

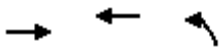
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	767	1465	815	463	354	698
v/c Ratio	1.47	0.60	0.53	0.61	1.96	1.62
Control Delay	244.7	7.2	14.4	13.1	471.6	313.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	244.7	7.2	14.4	13.1	471.6	313.8
Queue Length 50th (ft)	~211	72	110	81	~225	~198
Queue Length 95th (ft)	#307	203	156	166	#380	#302
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	522	2436	1534	758	181	430
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.47	0.60	0.53	0.61	1.96	1.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

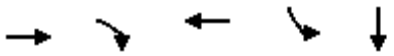
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	2651	901	610
v/c Ratio	0.87dr	0.27	1.23dr
Control Delay	8.5	7.5	38.9
Queue Delay	0.0	0.0	0.0
Total Delay	8.5	7.5	38.9
Queue Length 50th (ft)	156	71	163
Queue Length 95th (ft)	194	100	184
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3258	3356	1092
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.81	0.27	0.56

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	2292	119	1074	443	640
v/c Ratio	0.79	0.13	0.37	0.77	0.85
Control Delay	20.6	3.8	4.8	34.4	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	3.8	4.8	34.4	24.1
Queue Length 50th (ft)	352	2	36	232	188
Queue Length 95th (ft)	438	24	47	231	195
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	2890	925	2873	774	902
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.79	0.13	0.37	0.57	0.71

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	415	407	366	586	1583	1554	856
v/c Ratio	1.00	0.97	0.80	1.51	0.70	1.23	0.93
Control Delay	79.8	70.7	39.2	253.4	27.7	139.3	27.5
Queue Delay	0.0	0.0	0.0	0.0	48.9	0.4	0.0
Total Delay	79.8	70.7	39.2	253.4	76.6	139.6	27.5
Queue Length 50th (ft)	248	246	160	~476	519	~580	167
Queue Length 95th (ft)	#448	#450	#313	m#348	m401	#714	#464
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	415	421	455	389	2266	1263	918
Starvation Cap Reductn	0	0	0	0	1046	0	0
Spillback Cap Reductn	0	0	0	0	0	105	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.97	0.80	1.51	1.30	1.34	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	405	541	1696	834	333	1952
v/c Ratio	0.94	1.15	1.33	0.87	0.89	0.88
Control Delay	63.9	117.4	180.6	19.0	43.1	6.4
Queue Delay	133.8	33.4	0.4	0.0	0.0	45.0
Total Delay	197.8	150.8	181.0	19.0	43.1	51.4
Queue Length 50th (ft)	236	~348	~682	113	141	83
Queue Length 95th (ft)	#423	#558	#817	#403	m120	m75
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	433	471	1278	955	399	2226
Starvation Cap Reductn	0	0	0	0	0	446
Spillback Cap Reductn	415	402	114	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	22.50	7.84	1.46	0.87	0.83	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	561	342	399	2232	244	1115
v/c Ratio	0.42	0.42	0.88	0.93	0.29	1.27
Control Delay	55.0	26.1	40.6	14.1	35.7	150.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	26.1	40.6	14.1	35.7	150.3
Queue Length 50th (ft)	236	130	191	557	77	~732
Queue Length 95th (ft)	m226	m122	m123	m108	113	#992
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1329	810	548	2391	848	876
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.42	0.73	0.93	0.29	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

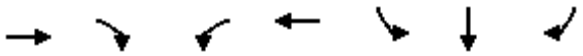
Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1174	499	745	78	265	164	165	70
v/c Ratio	1.24	0.98	0.34	1.00	0.79	0.66	0.62	0.19
Control Delay	156.1	69.7	6.2	159.5	23.8	59.4	56.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	156.1	69.7	6.2	159.5	23.8	59.4	56.7	1.1
Queue Length 50th (ft)	~597	343	48	62	0	128	128	0
Queue Length 95th (ft)	#736	m#593	m122	#166	#121	184	184	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	945	508	2172	78	340	392	418	500
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	0.98	0.34	1.00	0.78	0.42	0.39	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2154	873	1162	1674	252	248	226
v/c Ratio	1.40	0.95	1.22	0.63	0.92	0.78	0.75
Control Delay	210.9	36.6	129.0	11.7	84.5	50.0	46.7
Queue Delay	0.3	0.0	0.0	2.6	55.0	59.4	0.0
Total Delay	211.3	36.6	129.0	14.2	139.5	109.4	46.7
Queue Length 50th (ft)	~1072	363	~522	497	185	135	112
Queue Length 95th (ft)	#1210	#671	m310	m253	#342	#267	#226
Internal Link Dist (ft)	2381			680		968	
Turn Bay Length (ft)			200		400		
Base Capacity (vph)	1542	919	954	2674	280	323	308
Starvation Cap Reductn	0	0	0	841	0	0	0
Spillback Cap Reductn	136	0	0	0	113	113	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.53	0.95	1.22	0.91	1.51	1.18	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

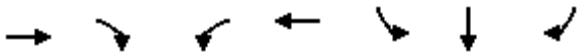
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	430	2219	2160	459	495	481	458
v/c Ratio	0.72	0.84	1.15	0.49	1.72	1.52	1.45
Control Delay	44.4	11.3	101.8	9.8	367.8	277.4	251.0
Queue Delay	0.0	46.7	0.0	0.0	1.0	0.8	0.0
Total Delay	44.4	58.0	101.8	9.8	368.8	278.2	251.0
Queue Length 50th (ft)	125	871	~946	84	~544	~478	~423
Queue Length 95th (ft)	m80	m78	#1145	185	#758	#704	#636
Internal Link Dist (ft)		680	1069			1143	
Turn Bay Length (ft)	235				450		400
Base Capacity (vph)	1002	2641	1875	944	288	317	315
Starvation Cap Reductn	0	625	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	22	20	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	1.10	1.15	0.49	1.86	1.62	1.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1566	663	125	1296	458	469	722
v/c Ratio	0.70	0.91	0.88	0.71	0.85	0.79	1.17
Control Delay	19.2	31.8	70.4	10.5	36.2	30.5	113.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	31.8	70.4	10.5	36.2	30.5	113.7
Queue Length 50th (ft)	139	135	52	113	158	158	~292
Queue Length 95th (ft)	176	#340	m#72	m124	#317	#307	#482
Internal Link Dist (ft)	1585			438		1249	
Turn Bay Length (ft)					775		510
Base Capacity (vph)	2233	725	142	1835	541	592	617
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.91	0.88	0.71	0.85	0.79	1.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

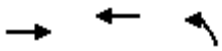
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	603	1613	863	828	300	600
v/c Ratio	1.05	0.71	0.67	1.25	1.16	1.05
Control Delay	70.1	20.1	19.3	144.3	134.2	78.1
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	70.1	20.2	19.3	144.3	134.2	78.1
Queue Length 50th (ft)	~127	312	134	~352	~146	~128
Queue Length 95th (ft)	m#209	m382	191	#552	#290	#226
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	574	2256	1293	663	259	572
Starvation Cap Reductn	0	53	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.73	0.67	1.25	1.16	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

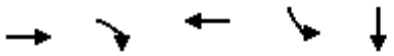
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	1941	1008	909
v/c Ratio	0.63	0.32	1.34dr
Control Delay	17.4	11.9	52.8
Queue Delay	0.0	0.0	0.0
Total Delay	17.4	11.9	52.8
Queue Length 50th (ft)	280	135	324
Queue Length 95th (ft)	m293	166	#412
Internal Link Dist (ft)	119	568	1455
Turn Bay Length (ft)			
Base Capacity (vph)	3084	3170	1055
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.63	0.32	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBT	EBR	WBT	SBL	SBT
Lane Group Flow (vph)	1367	114	1172	446	1063
v/c Ratio	1.04	0.24	1.04dr	0.40	1.00
Control Delay	78.7	10.1	39.4	9.8	46.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	78.7	10.1	39.4	9.8	46.6
Queue Length 50th (ft)	~417	8	272	146	766
Queue Length 95th (ft)	#514	54	331	210	#1157
Internal Link Dist (ft)	842		226		1461
Turn Bay Length (ft)					
Base Capacity (vph)	1318	476	1371	1102	1064
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.04	0.24	0.85	0.40	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	494	488	456	432	1731	1422	849
v/c Ratio	1.05	1.04	0.92	1.23	0.81	1.16	0.89
Control Delay	89.5	84.0	50.9	134.8	28.6	112.0	20.7
Queue Delay	0.0	0.0	0.0	0.0	48.4	0.4	0.0
Total Delay	89.5	84.0	50.9	134.8	77.0	112.4	20.7
Queue Length 50th (ft)	~326	~323	220	~308	566	~509	112
Queue Length 95th (ft)	#526	#535	#417	m#242	m488	#642	#409
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	469	470	498	351	2145	1223	949
Starvation Cap Reductn	0	0	0	0	931	0	0
Spillback Cap Reductn	0	0	0	0	0	122	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	1.04	0.92	1.23	1.43	1.29	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	544	597	1492	606	283	1868
v/c Ratio	1.21	1.35	1.15	0.69	0.83	0.85
Control Delay	143.5	199.8	104.9	9.5	41.0	7.5
Queue Delay	619.3	131.7	0.3	0.0	0.0	46.9
Total Delay	762.8	331.5	105.2	9.5	41.0	54.3
Queue Length 50th (ft)	~401	~469	~546	40	120	96
Queue Length 95th (ft)	#607	#686	#700	163	m101	m86
Internal Link Dist (ft)		1359	1082			385
Turn Bay Length (ft)	900					
Base Capacity (vph)	451	443	1301	883	399	2186
Starvation Cap Reductn	0	0	0	0	0	494
Spillback Cap Reductn	451	433	82	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	544.00	59.70	1.22	0.69	0.71	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	921	253	439	2406	291	1391
v/c Ratio	0.69	0.34	0.97	1.01	0.34	1.76
Control Delay	40.2	11.7	64.1	24.7	36.6	365.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	11.7	64.1	24.7	36.6	365.7
Queue Length 50th (ft)	398	55	300	~594	93	~1324
Queue Length 95th (ft)	466	121	m247	m181	134	#1591
Internal Link Dist (ft)	703			8289	1936	
Turn Bay Length (ft)			300			420
Base Capacity (vph)	1326	753	463	2391	848	792
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.34	0.95	1.01	0.34	1.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

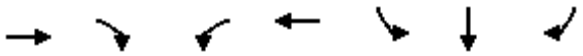
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	480	119	851	36	19	449	456	105
v/c Ratio	0.43	0.66	0.52	0.39	0.10	0.82	0.77	0.16
Control Delay	37.3	59.3	16.5	67.1	1.0	48.7	44.4	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	59.3	16.5	67.1	1.0	48.7	44.4	1.8
Queue Length 50th (ft)	165	85	207	27	0	329	327	0
Queue Length 95th (ft)	238	m93	m263	63	0	421	412	15
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1108	192	1648	96	193	669	721	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.62	0.52	0.38	0.10	0.67	0.63	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1694	747	941	2287	362	353	337
v/c Ratio	1.04	0.73	1.50	0.95	0.92	0.86	0.83
Control Delay	65.0	10.7	258.7	17.5	70.4	53.2	50.1
Queue Delay	0.0	0.0	0.0	44.3	61.7	60.7	0.0
Total Delay	65.0	10.7	258.7	61.8	132.2	113.9	50.1
Queue Length 50th (ft)	~683	98	~485	843	260	213	190
Queue Length 95th (ft)	#822	255	m#273	m474	#434	#383	#343
Internal Link Dist (ft)	2381			680		968	
Turn Bay Length (ft)			200		400		
Base Capacity (vph)	1624	1028	626	2418	413	427	421
Starvation Cap Reductn	0	0	0	384	0	0	0
Spillback Cap Reductn	0	0	0	0	259	238	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.73	1.50	1.12	2.35	1.87	0.80

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	242	1939	2548	485	534	503	496
v/c Ratio	0.59	0.89	1.58	0.59	1.06	1.03	1.00
Control Delay	34.9	29.1	290.6	16.3	93.8	83.9	75.3
Queue Delay	0.0	43.8	0.3	0.0	22.4	28.4	0.0
Total Delay	34.9	72.9	290.8	16.3	116.1	112.4	75.3
Queue Length 50th (ft)	76	778	~1350	141	~434	~380	~327
Queue Length 95th (ft)	m71	m771	#1529	264	#655	#610	#565
Internal Link Dist (ft)		680	1069			1143	
Turn Bay Length (ft)	235				450		400
Base Capacity (vph)	684	2182	1612	825	506	486	495
Starvation Cap Reductn	0	410	0	0	0	0	0
Spillback Cap Reductn	0	0	129	0	222	198	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	1.09	1.72	0.59	1.88	1.75	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 9.7:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5284*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1953*	pc/h/ln
S	*63.4*	mph
D = v_p / S	*30.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4134*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1513*	pc/h/ln
S	*68.9*	mph
D = v_p / S	*22.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5235*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1925*	pc/h/ln
S	*63.9*	mph
D = v_p / S	*30.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6525*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3582*	pc/h/ln
S	*4.2*	mph
D = v_p / S	*856.4*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6350*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2347*	pc/h/ln
S	*54.7*	mph
D = v_p / S	*42.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CHS*	Highway/Direction of Travel	*SR-71 Northbound*
Agency or Company	*Urban Crossroads, Inc.*	From/To	*S of Chino Hills*
Date Performed	*10/20/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4928*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1812*	pc/h/ln
S	*65.7*	mph
D = v_p / S	*27.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
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LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7873*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3009*	pc/h/ln
S	*32.0*	mph
D = v_p / S	*93.9*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7727*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2954*	pc/h/ln
S	*34.3*	mph
D = v_p / S	*86.1*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6530*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1801*	pc/h/ln
S	*65.8*	mph
D = v_p / S	*27.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6219*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1732*	pc/h/ln
S	*66.7*	mph
D = v_p / S	*26.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8220*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*6*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.971*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2301*	pc/h/ln
S	*55.9*	mph
D = v_p / S	*41.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8479*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2385*	pc/h/ln
S	*53.7*	mph
D = v_p / S	*44.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5707*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2161*	pc/h/ln
S	*59.3*	mph
D = v_p / S	*36.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6889*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2583*	pc/h/ln
S	*47.8*	mph
D = v_p / S	*54.0*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5096*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1865*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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General Information

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Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5546*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2019*	pc/h/ln
S	*62.2*	mph
D = v_p / S	*32.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4423*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1627*	pc/h/ln
S	*67.9*	mph
D = v_p / S	*24.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

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Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2867*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1054*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4959*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1824*	pc/h/ln
S	*65.5*	mph
D = v_p / S	*27.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6309*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3446*	pc/h/ln
S	*11.5*	mph
D = v_p / S	*300.1*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6763*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2487*	pc/h/ln
S	*50.8*	mph
D = v_p / S	*49.0*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5298*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1948*	pc/h/ln
S	*63.5*	mph
D = v_p / S	*30.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7677*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2893*	pc/h/ln
S	*36.8*	mph
D = v_p / S	*78.7*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8163*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3076*	pc/h/ln
S	*29.2*	mph
D = v_p / S	*105.4*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8012*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2210*	pc/h/ln
S	*58.2*	mph
D = v_p / S	*38.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8195*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2260*	pc/h/ln
S	*57.0*	mph
D = v_p / S	*39.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8215*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2266*	pc/h/ln
S	*56.8*	mph
D = v_p / S	*39.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7905*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2191*	pc/h/ln
S	*58.6*	mph
D = v_p / S	*37.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4355*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1665*	pc/h/ln
S	*67.5*	mph
D = v_p / S	*24.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4935*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1877*	pc/h/ln
S	*64.7*	mph
D = v_p / S	*29.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4304*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1583*	pc/h/ln
S	*68.3*	mph
D = v_p / S	*23.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5091*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1863*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 9.8:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5384*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1990*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*31.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4205*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1539*	pc/h/ln
S	*68.7*	mph
D = v_p / S	*22.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5306*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1951*	pc/h/ln
S	*63.5*	mph
D = v_p / S	*30.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6544*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3592*	pc/h/ln
S	*3.6*	mph
D = v_p / S	*989.9*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6369*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2354*	pc/h/ln
S	*54.6*	mph
D = v_p / S	*43.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4942*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1817*	pc/h/ln
S	*65.6*	mph
D = v_p / S	*27.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7887*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3015*	pc/h/ln
S	*31.8*	mph
D = v_p / S	*94.9*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7827*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2992*	pc/h/ln
S	*32.7*	mph
D = v_p / S	*91.4*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6538*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1803*	pc/h/ln
S	*65.8*	mph
D = v_p / S	*27.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6270*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1746*	pc/h/ln
S	*66.5*	mph
D = v_p / S	*26.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8260*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2323*	pc/h/ln
S	*55.4*	mph
D = v_p / S	*42.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8489*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2388*	pc/h/ln
S	*53.6*	mph
D = v_p / S	*44.5*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5707*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*9*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.957*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2161*	pc/h/ln
S	*59.3*	mph
D = v_p / S	*36.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6895*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*7*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.966*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2586*	pc/h/ln
S	*47.7*	mph
D = v_p / S	*54.2*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5096*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1865*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5579*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2031*	pc/h/ln
S	*62.0*	mph
D = v_p / S	*32.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4450*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1645*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2886*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1061*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*15.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4978*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1831*	pc/h/ln
S	*65.4*	mph
D = v_p / S	*28.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Southbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6403*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3515*	pc/h/ln
S	*7.8*	mph
D = v_p / S	*448.7*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6857*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2534*	pc/h/ln
S	*49.4*	mph
D = v_p / S	*51.3*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Chino Hills*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5365*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1983*	pc/h/ln
S	*62.9*	mph
D = v_p / S	*31.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*N of Central*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7744*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2918*	pc/h/ln
S	*35.8*	mph
D = v_p / S	*81.6*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-71 Northbound*
From/To	*S of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8190*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*3086*	pc/h/ln
S	*28.7*	mph
D = v_p / S	*107.4*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8050*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2220*	pc/h/ln
S	*57.9*	mph
D = v_p / S	*38.3*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8208*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2264*	pc/h/ln
S	*56.9*	mph
D = v_p / S	*39.8*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8225*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2280*	pc/h/ln
S	*56.5*	mph
D = v_p / S	*40.4*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7953*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2215*	pc/h/ln
S	*58.0*	mph
D = v_p / S	*38.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4355*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1665*	pc/h/ln
S	*67.5*	mph
D = v_p / S	*24.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4966*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1889*	pc/h/ln
S	*64.5*	mph
D = v_p / S	*29.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4304*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1583*	pc/h/ln
S	*68.3*	mph
D = v_p / S	*23.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5100*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1866*	pc/h/ln
S	*64.9*	mph
D = v_p / S	*28.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 9.9:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 5284	
	Ramp Volume, V_R: 1150	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5284	0.92	Level	4	0	0.980	1.00	5858
Ramp	1150	0.92	Level	10	0	0.952	1.00	1312
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.553 using Equation (Exhibit 13-7)

V_{12} = 3827 pc/h

V_3 or V_{av34} 2031 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5858	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4546	Exhibit 13-8	7200	No
V_R	1312	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3827	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.8 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.416 (Exhibit 13-12)

S_R = 58.3 mph (Exhibit 13-12)

S_0 = 72.8 mph (Exhibit 13-12)

S = 62.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	5235	V_D =	520 veh/h
		Ramp Volume, V_R	790		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5235	0.92	Level	3	0	0.985	1.00	5776
Ramp	790	0.92	Level	12	0	0.943	1.00	910
UpStream								
DownStream	520	0.92	Level	8	0	0.962	1.00	588

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.574 using Equation (Exhibit 13-7)

V_{12} = 3702 pc/h

V_3 or V_{av34} 2074 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5776	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4866	Exhibit 13-8	7200	No
V_R	910	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3702	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.380 (Exhibit 13-12)

S_R = 59.4 mph (Exhibit 13-12)

S_0 = 72.6 mph (Exhibit 13-12)

S = 63.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	475	☑ No	☐ Off
L_{up} =	1460 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	364 veh/h	Freeway Volume, V_F	4606	V_D =	veh/h
		Ramp Volume, V_R	1220		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	25.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4606	0.92	Level	2	0	0.990	1.00	5057
Ramp	1220	0.92	Level	6	0	0.971	1.00	1366
UpStream	364	0.92	Level	11	0	0.948	1.00	417
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 5057 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6423	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6423	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 52.0 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 2.699 (Exibit 13-11)

S_R = -5.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = -5.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 699 veh/h
	Freeway Volume, V_F: 4606	
	Ramp Volume, V_R: 1220	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4606	0.92	Level	2	0	0.990	1.00	5057
Ramp	1220	0.92	Level	6	0	0.971	1.00	1366
UpStream								
DownStream	699	0.92	Level	1	0	0.995	1.00	764

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 5057 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6423	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6423	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 52.0 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 2.699 (Exibit 13-11)

S_R = -5.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = -5.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp		Downstream Adj Ramp	
☐ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☑ No	☐ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	ft	Acceleration Lane Length, L_A	450	L_{down} =	ft
V_u =	veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	4928		
		Ramp Volume, V_R	1422		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4928	0.92	Level	3	0	0.985	1.00	5437
Ramp	1422	0.92	Level	6	0	0.971	1.00	1592
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 3208 pc/h

V_3 or V_{av34} = 2229 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3208 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7029	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4800	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 39.4 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.754 (Exibit 13-11)

S_R = 48.9 mph (Exhibit 13-11)

S_0 = 63.8 mph (Exhibit 13-11)

S = 52.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	835 veh/h	Freeway Volume, V_F	7453	V_D =	veh/h
		Ramp Volume, V_R	420		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7453	0.92	Level	11	0	0.948	1.00	8547
Ramp	420	0.92	Level	21	0	0.905	1.00	504
UpStream	835	0.92	Level	2	0	0.990	1.00	917
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 5056 pc/h

V_3 or V_{av34} 3491 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 5847 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9051	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6351	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 51.6 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 2.511 (Exibit 13-11)

S_R= -0.3 mph (Exhibit 13-11)

S_0= 61.1 mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	7727	V_D =	711 veh/h
		Ramp Volume, V_R	1176		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7727	0.92	Level	11	0	0.948	1.00	8861
Ramp	1176	0.92	Level	7	0	0.966	1.00	1323
UpStream								
DownStream	711	0.92	Level	6	0	0.971	1.00	796

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.478 using Equation (Exhibit 13-7)

V_{12} = 4923 pc/h

V_3 or V_{av34} 3938 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 6161 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8861	Exhibit 13-8	7200	Yes
$V_{FO} = V_F - V_R$	7538	Exhibit 13-8	7200	Yes
V_R	1323	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4923	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 57.2 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

D_s = 0.417 (Exhibit 13-12)

S_R= 58.3 mph (Exhibit 13-12)

S_0= 70.2 mph (Exhibit 13-12)

S = 61.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 2200 ft	Acceleration Lane Length, L_A: 750	L_{down} = ft
V_u = 1019 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 5200	
	Ramp Volume, V_R: 1330	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5200	0.92	Level	2	0	0.990	1.00	5709
Ramp	1330	0.92	Level	11	0	0.948	1.00	1525
UpStream	1019	0.92	Level	20	0	0.909	1.00	1218
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.027 using Equation (Exhibit 13-6)

V_{12} = 155 pc/h

V_3 or V_{av34} = 2777 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2283 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7234	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3808	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.429 (Exibit 13-11)

S_R = 58.0 mph (Exhibit 13-11)

S_0 = 65.6 mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	6219	V_D =	1330 veh/h
		Ramp Volume, V_R	1019		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6219	0.92	Level	5	0	0.976	1.00	6929
Ramp	1019	0.92	Level	20	0	0.909	1.00	1218
UpStream								
DownStream	1330	0.92	Level	11	0	0.948	1.00	1525

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3708 pc/h

V_3 or V_{av34} 1610 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6929	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5711	Exhibit 13-8	9600	No
V_R	1218	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3708	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 34.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.408 (Exhibit 13-12)

S_R = 58.6 mph (Exhibit 13-12)

S_0 = 74.4 mph (Exhibit 13-12)

S = 65.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	8220	V_D =	1080 veh/h
		Ramp Volume, V_R	821		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8220	0.92	Level	6	0	0.971	1.00	9203
Ramp	821	0.92	Level	16	0	0.926	1.00	964
UpStream								
DownStream	1080	0.92	Level	16	0	0.926	1.00	1268

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4556 pc/h

V_3 or V_{av34} 2323 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9203	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	8239	Exhibit 13-8	9600	No
V_R	964	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4556	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 41.5 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.385 (Exhibit 13-12)

S_R = 59.2 mph (Exhibit 13-12)

S_0 = 71.6 mph (Exhibit 13-12)

S = 64.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2115 ft
- V_u = 821 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	7399
Ramp Volume, V_R	1080
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7399	0.92	Level	5	0	0.976	1.00	8243
Ramp	1080	0.92	Level	16	0	0.926	1.00	1268
UpStream	821	0.92	Level	16	0	0.926	1.00	964
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = (Equation 13-6 or 13-7)
- P_{FM} = 0.059 using Equation (Exhibit 13-6)
- V_{12} = 489 pc/h
- V_3 or V_{av34} = 3877 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 3297 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9511	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4565	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

- D_R = 37.4 (pc/mi/ln)
- LOS = E (Exhibit 13-2)

Speed Determination

- M_S = 0.651 (Exibit 13-11)
- S_R = 51.8 mph (Exhibit 13-11)
- S_0 = 62.4 mph (Exhibit 13-11)
- S = 56.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	1930 ft
V_u =	veh/h	Freeway Volume, V_F	5707	V_D =	1843 veh/h
		Ramp Volume, V_R	661		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5707	0.92	Level	9	0	0.957	1.00	6482
Ramp	661	0.92	Level	18	0	0.917	1.00	783
UpStream								
DownStream	1843	0.92	Level	7	0	0.966	1.00	2073

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.562 using Equation (Exhibit 13-7)

V_{12} = 3985 pc/h

V_3 or V_{av34} 2497 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6482	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	5699	Exhibit 13-8	7200	No
V_R	783	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3985	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.368 (Exhibit 13-12)

S_R = 59.7 mph (Exhibit 13-12)

S_0 = 71.0 mph (Exhibit 13-12)

S = 63.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	1930 ft	Acceleration Lane Length, L_A	675	L_{down} =	ft
V_u =	661 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	5046		
		Ramp Volume, V_R	1843		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5046	0.92	Level	8	0	0.962	1.00	5704
Ramp	1843	0.92	Level	7	0	0.966	1.00	2073
UpStream	661	0.92	Level	18	0	0.917	1.00	783
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1915.38 (Equation 13-6 or 13-7)

P_{FM} = 0.596 using Equation (Exhibit 13-6)

V_{12} = 3402 pc/h

V_3 or V_{av34} = 2302 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3402 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7777	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	5475	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 43.0 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 1.191 (Exibit 13-11)

S_R = 36.7 mph (Exhibit 13-11)

S_0 = 63.5 mph (Exhibit 13-11)

S = 41.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2010 ft
V_u = 1250 veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	700
Deceleration Lane Length L_D	
Freeway Volume, V_F	4296
Ramp Volume, V_R	800
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4296	0.92	Level	0	0	1.000	1.00	4670
Ramp	800	0.92	Level	12	0	0.943	1.00	922
UpStream	1250	0.92	Level	5	0	0.976	1.00	1393
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1458.89 (Equation 13-6 or 13-7)
P_{FM} = 0.597 using Equation (Exhibit 13-6)
V_{12} = 2788 pc/h
V_3 or V_{av34} = 1882 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 2788 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5592	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3710	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.6 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.417 (Exibit 13-11)
S_R = 58.3 mph (Exhibit 13-11)
S_0 = 65.0 mph (Exhibit 13-11)
S = 60.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	200
Freeway Volume, V_F	5546
Ramp Volume, V_R	1250
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2010 ft; V_D = 800 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5546	0.92	Level	1	0	0.995	1.00	6058
Ramp	1250	0.92	Level	5	0	0.976	1.00	1393
UpStream								
DownStream	800	0.92	Level	12	0	0.943	1.00	922

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.544 using Equation (Exhibit 13-7)

V_{12} = 3933 pc/h

V_3 or V_{av34} 2125 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6058	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4665	Exhibit 13-8	7200	No
V_R	1393	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3933	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.423 (Exhibit 13-12)

S_R = 58.1 mph (Exhibit 13-12)

S_0 = 72.4 mph (Exhibit 13-12)

S = 62.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D: 150	V_D = veh/h
	Freeway Volume, V_F: 4423	
	Ramp Volume, V_R: 1556	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4423	0.92	Level	3	0	0.985	1.00	4880
Ramp	1556	0.92	Level	4	0	0.980	1.00	1725
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.559 using Equation (Exhibit 13-7)

V_{12} = 3488 pc/h

V_3 or V_{av34} 1392 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4880	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3155	Exhibit 13-8	7200	No
V_R	1725	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3488	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.453 (Exhibit 13-12)

S_R = 57.3 mph (Exhibit 13-12)

S_0 = 75.3 mph (Exhibit 13-12)

S = 61.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	4959	V_D =	584 veh/h
		Ramp Volume, V_R	1476		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4959	0.92	Level	3	0	0.985	1.00	5471
Ramp	1476	0.92	Level	5	0	0.976	1.00	1644
UpStream								
DownStream	584	0.92	Level	3	0	0.985	1.00	644

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.548 using Equation (Exhibit 13-7)

V_{12} = 3740 pc/h

V_3 or V_{av34} 1731 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5471	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3827	Exhibit 13-8	7200	No
V_R	1644	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3740	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.446 (Exhibit 13-12)

S_R= 57.5 mph (Exhibit 13-12)

S_0= 73.9 mph (Exhibit 13-12)

S = 61.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	2	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	475	☑ No	☐ Off
L_{up} =	1460 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	980 veh/h	Freeway Volume, V_F	4853	V_D =	veh/h
		Ramp Volume, V_R	1366		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	25.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4853	0.92	Level	1	0	0.995	1.00	5301
Ramp	1366	0.92	Level	2	0	0.990	1.00	1500
UpStream	980	0.92	Level	5	0	0.976	1.00	1092
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 5301 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6801	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6801	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 54.9 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 3.802 (Exibit 13-11)

S_R = -36.5 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = -36.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 90 veh/h
	Freeway Volume, V_F: 4853	
	Ramp Volume, V_R: 1366	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4853	0.92	Level	1	0	0.995	1.00	5301
Ramp	1366	0.92	Level	2	0	0.990	1.00	1500
UpStream								
DownStream	90	0.92	Level	8	0	0.962	1.00	102

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 5301 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6801	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6801	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 54.9 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 3.802 (Exibit 13-11)

S_R = -36.5 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = -36.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp Inputs		Downstream Adj Ramp	
☐ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☑ No	☐ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	ft	Acceleration Lane Length, L_A	450	L_{down} =	ft
V_u =	veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	5298		
		Ramp Volume, V_R	1465		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5298	0.92	Level	3	0	0.985	1.00	5845
Ramp	1465	0.92	Level	4	0	0.980	1.00	1624
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 3449 pc/h

V_3 or V_{av34} = 2396 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3449 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7469	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	5073	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 41.5 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 0.903 (Exibit 13-11)

S_R = 44.7 mph (Exhibit 13-11)

S_0 = 62.9 mph (Exhibit 13-11)

S = 49.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	607 veh/h	Freeway Volume, V_F	7037	V_D =	veh/h
		Ramp Volume, V_R	640		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7037	0.92	Level	8	0	0.962	1.00	7955
Ramp	640	0.92	Level	10	0	0.952	1.00	730
UpStream	607	0.92	Level	2	0	0.990	1.00	666
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 4705 pc/h

V_3 or V_{av34} 3250 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 5255 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8685	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	5985	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 48.7 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 1.826 (Exibit 13-11)

S_R= 18.9 mph (Exhibit 13-11)

S_0= 61.1 mph (Exhibit 13-11)

S = 24.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	8163	V_D =	623 veh/h
		Ramp Volume, V_R	1480		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8163	0.92	Level	8	0	0.962	1.00	9228
Ramp	1480	0.92	Level	8	0	0.962	1.00	1673
UpStream								
DownStream	623	0.92	Level	2	0	0.990	1.00	684

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.452 using Equation (Exhibit 13-7)

V_{12} = 5090 pc/h

V_3 or V_{av34} 4138 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 6528 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9228	Exhibit 13-8	7200	Yes
$V_{FO} = V_F - V_R$	7555	Exhibit 13-8	7200	Yes
V_R	1673	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	5090	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 60.4 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

D_s = 0.449 (Exhibit 13-12)

S_R= 57.4 mph (Exhibit 13-12)

S_0= 70.2 mph (Exhibit 13-12)

S = 60.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway / Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	4	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2200 ft	Acceleration Lane Length, L_A	750	L_{down} =	ft
V_u =	1356 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	6852		
		Ramp Volume, V_R	1198		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6852	0.92	Level	2	0	0.990	1.00	7522
Ramp	1198	0.92	Level	10	0	0.952	1.00	1367
UpStream	1356	0.92	Level	9	0	0.957	1.00	1540
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.047 using Equation (Exhibit 13-6)

V_{12} = 353 pc/h

V_3 or V_{av34} = 3584 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3008 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8889	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4375	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 34.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.563 (Exibit 13-11)

S_R = 54.2 mph (Exhibit 13-11)

S_0 = 63.7 mph (Exhibit 13-11)

S = 58.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	8195	V_D =	1160 veh/h
		Ramp Volume, V_R	1343		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8195	0.92	Level	3	0	0.985	1.00	9041
Ramp	1343	0.92	Level	8	0	0.962	1.00	1518
UpStream								
DownStream	1160	0.92	Level	8	0	0.962	1.00	1311

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4798 pc/h

V_3 or V_{av34} 2121 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9041	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7523	Exhibit 13-8	9600	No
V_R	1518	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4798	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 43.9 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.435 (Exhibit 13-12)

S_R = 57.8 mph (Exhibit 13-12)

S_0 = 72.4 mph (Exhibit 13-12)

S = 63.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	8215	V_D =	790 veh/h
		Ramp Volume, V_R	1100		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8215	0.92	Level	3	0	0.985	1.00	9063
Ramp	1100	0.92	Level	9	0	0.957	1.00	1249
UpStream								
DownStream	790	0.92	Level	18	0	0.917	1.00	936

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4656 pc/h

V_3 or V_{av34} 2203 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9063	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7814	Exhibit 13-8	9600	No
V_R	1249	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4656	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 42.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.410 (Exhibit 13-12)

S_R= 58.5 mph (Exhibit 13-12)

S_0= 72.1 mph (Exhibit 13-12)

S = 64.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2115 ft
- V_u = 1100 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	7115
Ramp Volume, V_R	790
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7115	0.92	Level	3	0	0.985	1.00	7850
Ramp	790	0.92	Level	18	0	0.917	1.00	936
UpStream	1100	0.92	Level	9	0	0.957	1.00	1249
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = (Equation 13-6 or 13-7)
- P_{FM} = 0.101 using Equation (Exhibit 13-6)
- V_{12} = 791 pc/h
- V_3 or V_{av34} = 3529 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 3140 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8786	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4076	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

- D_R = 33.7 (pc/mi/ln)
- LOS = D (Exhibit 13-2)

Speed Determination

- M_S = 0.506 (Exibit 13-11)
- S_R = 55.8 mph (Exhibit 13-11)
- S_0 = 63.1 mph (Exhibit 13-11)
- S = 59.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	1930 ft
V_u =	veh/h	Freeway Volume, V_F	4355	V_D =	1600 veh/h
		Ramp Volume, V_R	1020		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4355	0.92	Level	11	0	0.948	1.00	4994
Ramp	1020	0.92	Level	6	0	0.971	1.00	1142
UpStream								
DownStream	1600	0.92	Level	5	0	0.976	1.00	1783

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.583 using Equation (Exhibit 13-7)

V_{12} = 3386 pc/h

V_3 or V_{av34} 1608 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4994	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3852	Exhibit 13-8	7200	No
V_R	1142	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3386	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.401 (Exhibit 13-12)

S_R = 58.8 mph (Exhibit 13-12)

S_0 = 74.4 mph (Exhibit 13-12)

S = 63.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 1930 ft
- V_u = 1020 veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	675
Deceleration Lane Length L_D	
Freeway Volume, V_F	3335
Ramp Volume, V_R	1600
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3335	0.92	Level	12	0	0.943	1.00	3842
Ramp	1600	0.92	Level	5	0	0.976	1.00	1783
UpStream	1020	0.92	Level	6	0	0.971	1.00	1142
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = 1454.85 (Equation 13-6 or 13-7)
- P_{FM} = 0.596 using Equation (Exhibit 13-6)
- V_{12} = 2291 pc/h
- V_3 or V_{av34} = 1551 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 2291 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5625	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4074	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

- D_R = 32.2 (pc/mi/ln)
- LOS = D (Exhibit 13-2)

Speed Determination

- M_S = 0.490 (Exibit 13-11)
- S_R = 56.3 mph (Exhibit 13-11)
- S_0 = 66.2 mph (Exhibit 13-11)
- S = 58.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2010 ft	Acceleration Lane Length, L_A	700	L_{down} =	ft
V_u =	1507 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	3584		
		Ramp Volume, V_R	720		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3584	0.92	Level	1	0	0.995	1.00	3915
Ramp	720	0.92	Level	8	0	0.962	1.00	814
UpStream	1507	0.92	Level	5	0	0.976	1.00	1679
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1274.21 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 2338 pc/h

V_3 or V_{av34} = 1577 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2338 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4729	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3152	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.349 (Exibit 13-11)

S_R = 60.2 mph (Exhibit 13-11)

S_0 = 66.1 mph (Exhibit 13-11)

S = 62.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	200
Freeway Volume, V_F	5091
Ramp Volume, V_R	1507
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 2010 ft; V_D = 720 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5091	0.92	Level	2	0	0.990	1.00	5589
Ramp	1507	0.92	Level	5	0	0.976	1.00	1679
UpStream								
DownStream	720	0.92	Level	8	0	0.962	1.00	814

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.543 using Equation (Exhibit 13-7)

V_{12} = 3802 pc/h

V_3 or V_{av34} 1787 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5589	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3910	Exhibit 13-8	7200	No
V_R	1679	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3802	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.449 (Exhibit 13-12)

S_R = 57.4 mph (Exhibit 13-12)

S_0 = 73.7 mph (Exhibit 13-12)

S = 61.8 mph (Exhibit 13-13)

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APPENDIX 9.10:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☑ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	ft
V_u =	veh/h	Freeway Volume, V_F	5384	V_D =	veh/h
		Ramp Volume, V_R	1179		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5384	0.92	Level	4	0	0.980	1.00	5969
Ramp	1179	0.92	Level	11	0	0.948	1.00	1352
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.549 using Equation (Exhibit 13-7)

V_{12} = 3885 pc/h

V_3 or V_{av34} 2084 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5969	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4617	Exhibit 13-8	7200	No
V_R	1352	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3885	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.420 (Exhibit 13-12)

S_R = 58.2 mph (Exhibit 13-12)

S_0 = 72.6 mph (Exhibit 13-12)

S = 62.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	5306	V_D =	520 veh/h
		Ramp Volume, V_R	835		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5306	0.92	Level	3	0	0.985	1.00	5854
Ramp	835	0.92	Level	13	0	0.939	1.00	967
UpStream								
DownStream	520	0.92	Level	8	0	0.962	1.00	588

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.569 using Equation (Exhibit 13-7)

V_{12} = 3749 pc/h

V_3 or V_{av34} 2105 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5854	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4887	Exhibit 13-8	7200	No
V_R	967	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3749	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.385 (Exhibit 13-12)

S_R= 59.2 mph (Exhibit 13-12)

S_0= 72.5 mph (Exhibit 13-12)

S = 63.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 364 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4606	
	Ramp Volume, V_R: 1239	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4606	0.92	Level	2	0	0.990	1.00	5057
Ramp	1239	0.92	Level	6	0	0.971	1.00	1387
UpStream	364	0.92	Level	11	0	0.948	1.00	417
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 5057 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6444	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6444	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 52.1 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 2.750 (Exibit 13-11)

S_R = -7.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = -7.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 699 veh/h
	Freeway Volume, V_F: 4606	
	Ramp Volume, V_R: 1239	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4606	0.92	Level	2	0	0.990	1.00	5057
Ramp	1239	0.92	Level	6	0	0.971	1.00	1387
UpStream								
DownStream	699	0.92	Level	1	0	0.995	1.00	764

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 5057 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6444	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6444	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 52.1 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 2.750 (Exibit 13-11)

S_R = -7.0 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = -7.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4942	
	Ramp Volume, V_R: 1427	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4942	0.92	Level	3	0	0.985	1.00	5452
Ramp	1427	0.92	Level	6	0	0.971	1.00	1598
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 3217 pc/h

V_3 or V_{av34} = 2235 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3217 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7050	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4815	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 39.5 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.762 (Exibit 13-11)

S_R = 48.7 mph (Exhibit 13-11)

S_0 = 63.8 mph (Exhibit 13-11)

S = 52.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	835 veh/h	Freeway Volume, V_F	7459	V_D =	veh/h
		Ramp Volume, V_R	428		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7459	0.92	Level	11	0	0.948	1.00	8554
Ramp	428	0.92	Level	21	0	0.905	1.00	514
UpStream	835	0.92	Level	2	0	0.990	1.00	917
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 5060 pc/h

V_3 or V_{av34} = 3494 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 5854 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9068	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6368	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 51.8 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 2.549 (Exibit 13-11)

S_R = -1.4 mph (Exhibit 13-11)

S_0 = 61.1 mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	7827	V_D =	711 veh/h
		Ramp Volume, V_R	1276		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7827	0.92	Level	11	0	0.948	1.00	8976
Ramp	1276	0.92	Level	8	0	0.962	1.00	1442
UpStream								
DownStream	711	0.92	Level	6	0	0.971	1.00	796

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.469 using Equation (Exhibit 13-7)

V_{12} = 4977 pc/h

V_3 or V_{av34} 3999 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 6276 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	8976	Exhibit 13-8	7200	Yes
$V_{FO} = V_F - V_R$	7534	Exhibit 13-8	7200	Yes
V_R	1442	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4977	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 58.2 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

D_s = 0.428 (Exhibit 13-12)

S_R = 58.0 mph (Exhibit 13-12)

S_0 = 70.2 mph (Exhibit 13-12)

S = 61.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway / Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	4	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2200 ft	Acceleration Lane Length, L_A	750	L_{down} =	ft
V_u =	1070 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	5200		
		Ramp Volume, V_R	1338		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5200	0.92	Level	2	0	0.990	1.00	5709
Ramp	1338	0.92	Level	11	0	0.948	1.00	1534
UpStream	1070	0.92	Level	22	0	0.901	1.00	1291
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.026 using Equation (Exhibit 13-6)

V_{12} = 149 pc/h

V_3 or V_{av34} = 2780 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2283 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7243	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3817	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.431 (Exibit 13-11)

S_R = 57.9 mph (Exhibit 13-11)

S_0 = 65.6 mph (Exhibit 13-11)

S = 61.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	6270	V_D =	1338 veh/h
		Ramp Volume, V_R	1070		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6270	0.92	Level	5	0	0.976	1.00	6986
Ramp	1070	0.92	Level	22	0	0.901	1.00	1291
UpStream								
DownStream	1338	0.92	Level	11	0	0.948	1.00	1534

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3774 pc/h

V_3 or V_{av34} 1606 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6986	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	5695	Exhibit 13-8	9600	No
V_R	1291	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3774	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.414 (Exhibit 13-12)

S_R = 58.4 mph (Exhibit 13-12)

S_0 = 74.4 mph (Exhibit 13-12)

S = 64.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	8260	V_D =	1090 veh/h
		Ramp Volume, V_R	861		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8260	0.92	Level	7	0	0.966	1.00	9292
Ramp	861	0.92	Level	18	0	0.917	1.00	1020
UpStream								
DownStream	1090	0.92	Level	16	0	0.926	1.00	1280

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4627 pc/h

V_3 or V_{av34} 2332 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9292	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	8272	Exhibit 13-8	9600	No
V_R	1020	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4627	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 42.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.390 (Exhibit 13-12)

S_R = 59.1 mph (Exhibit 13-12)

S_0 = 71.6 mph (Exhibit 13-12)

S = 64.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 861 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	7399
Ramp Volume, V_R	1090
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7399	0.92	Level	5	0	0.976	1.00	8243
Ramp	1090	0.92	Level	16	0	0.926	1.00	1280
UpStream	861	0.92	Level	18	0	0.917	1.00	1020
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.058 using Equation (Exhibit 13-6)
V_{12} = 476 pc/h
V_3 or V_{av34} = 3883 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3297 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	9523	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4577	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 37.5 (pc/mi/ln)
LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.655 (Exibit 13-11)
S_R = 51.7 mph (Exhibit 13-11)
S_0 = 62.4 mph (Exhibit 13-11)
S = 56.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	1930 ft
V_u =	veh/h	Freeway Volume, V_F	5707	V_D =	1849 veh/h
		Ramp Volume, V_R	661		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5707	0.92	Level	9	0	0.957	1.00	6482
Ramp	661	0.92	Level	18	0	0.917	1.00	783
UpStream								
DownStream	1849	0.92	Level	7	0	0.966	1.00	2080

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.562 using Equation (Exhibit 13-7)

V_{12} = 3985 pc/h

V_3 or V_{av34} 2497 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6482	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	5699	Exhibit 13-8	7200	No
V_R	783	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3985	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.7 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.368 (Exhibit 13-12)

S_R = 59.7 mph (Exhibit 13-12)

S_0 = 71.0 mph (Exhibit 13-12)

S = 63.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway / Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	1930 ft	Acceleration Lane Length, L_A	675	L_{down} =	ft
V_u =	661 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	5046		
		Ramp Volume, V_R	1849		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5046	0.92	Level	8	0	0.962	1.00	5704
Ramp	1849	0.92	Level	7	0	0.966	1.00	2080
UpStream	661	0.92	Level	18	0	0.917	1.00	783
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1916.88 (Equation 13-6 or 13-7)

P_{FM} = 0.596 using Equation (Exhibit 13-6)

V_{12} = 3402 pc/h

V_3 or V_{av34} = 2302 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3402 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7784	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	5482	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 43.0 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 1.198 (Exibit 13-11)

S_R = 36.5 mph (Exhibit 13-11)

S_0 = 63.5 mph (Exhibit 13-11)

S = 41.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp Inputs		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2010 ft	Acceleration Lane Length, L_A	700	L_{down} =	ft
V_u =	1283 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	4296		
		Ramp Volume, V_R	800		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4296	0.92	Level	0	0	1.000	1.00	4670
Ramp	800	0.92	Level	12	0	0.943	1.00	922
UpStream	1283	0.92	Level	5	0	0.976	1.00	1429
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1458.89 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 2788 pc/h

V_3 or V_{av34} = 1882 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2788 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5592	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3710	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.417 (Exibit 13-11)

S_R = 58.3 mph (Exhibit 13-11)

S_0 = 65.0 mph (Exhibit 13-11)

S = 60.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	2010 ft
V_u =	veh/h	Freeway Volume, V_F	5579	V_D =	800 veh/h
		Ramp Volume, V_R	1283		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5579	0.92	Level	1	0	0.995	1.00	6094
Ramp	1283	0.92	Level	5	0	0.976	1.00	1429
UpStream								
DownStream	800	0.92	Level	12	0	0.943	1.00	922

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.542 using Equation (Exhibit 13-7)

V_{12} = 3957 pc/h

V_3 or V_{av34} 2137 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6094	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4665	Exhibit 13-8	7200	No
V_R	1429	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3957	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.5 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.427 (Exhibit 13-12)

S_R = 58.1 mph (Exhibit 13-12)

S_0 = 72.4 mph (Exhibit 13-12)

S = 62.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Chino Hills
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	150
Freeway Volume, V_F	4450
Ramp Volume, V_R	1564
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4450	0.92	Level	4	0	0.980	1.00	4934
Ramp	1564	0.92	Level	5	0	0.976	1.00	1742
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.557 using Equation (Exhibit 13-7)

V_{12} = 3518 pc/h

V_3 or V_{av34} 1416 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4934	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3192	Exhibit 13-8	7200	No
V_R	1742	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3518	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.455 (Exhibit 13-12)

S_R = 57.3 mph (Exhibit 13-12)

S_0 = 75.2 mph (Exhibit 13-12)

S = 61.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Central
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	150	L_{down} =	985 ft
V_u =	veh/h	Freeway Volume, V_F	4978	V_D =	584 veh/h
		Ramp Volume, V_R	1488		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4978	0.92	Level	3	0	0.985	1.00	5492
Ramp	1488	0.92	Level	6	0	0.971	1.00	1666
UpStream								
DownStream	584	0.92	Level	3	0	0.985	1.00	644

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.546 using Equation (Exhibit 13-7)

V_{12} = 3755 pc/h

V_3 or V_{av34} 1737 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5492	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3826	Exhibit 13-8	7200	No
V_R	1666	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3755	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.2 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.448 (Exhibit 13-12)

S_R = 57.5 mph (Exhibit 13-12)

S_0 = 73.9 mph (Exhibit 13-12)

S = 61.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Upstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1460 ft	Acceleration Lane Length, L_A: 475	L_{down} = ft
V_u = 980 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 4853	
	Ramp Volume, V_R: 1460	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4853	0.92	Level	1	0	0.995	1.00	5301
Ramp	1460	0.92	Level	4	0	0.980	1.00	1619
UpStream	980	0.92	Level	5	0	0.976	1.00	1092
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 5301 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6920	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6920	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 55.7 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 4.245 (Exibit 13-11)

S_R = -48.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = -48.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Southbound-Downstream
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 475	L_{down} = 1200 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 90 veh/h
	Freeway Volume, V_F: 4853	
	Ramp Volume, V_R: 1460	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4853	0.92	Level	1	0	0.995	1.00	5301
Ramp	1460	0.92	Level	4	0	0.980	1.00	1619
UpStream								
DownStream	90	0.92	Level	8	0	0.962	1.00	102

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 5301 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6920	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6920	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 55.7 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 4.245 (Exibit 13-11)

S_R = -48.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = -48.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Chino Hills
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 450	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 5365	
	Ramp Volume, V_R: 1492	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5365	0.92	Level	4	0	0.980	1.00	5948
Ramp	1492	0.92	Level	4	0	0.980	1.00	1654
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.590 using Equation (Exhibit 13-6)

V_{12} = 3510 pc/h

V_3 or V_{av34} = 2438 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3510 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7602	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	5164	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 42.2 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 0.962 (Exibit 13-11)

S_R = 43.1 mph (Exhibit 13-11)

S_0 = 62.6 mph (Exhibit 13-11)

S = 47.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Central
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☑ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☐ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	1170 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	607 veh/h	Freeway Volume, V_F	7062	V_D =	veh/h
		Ramp Volume, V_R	682		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7062	0.92	Level	7	0	0.966	1.00	7945
Ramp	682	0.92	Level	12	0	0.943	1.00	786
UpStream	607	0.92	Level	2	0	0.990	1.00	666
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 using Equation (Exhibit 13-6)

V_{12} = 4699 pc/h

V_3 or V_{av34} 3246 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes,V_{12a} = 5245 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8731	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	6031	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 49.0 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 1.899 (Exibit 13-11)

S_R= 16.8 mph (Exhibit 13-11)

S_0= 61.1 mph (Exhibit 13-11)

S = 21.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-71 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	0	L_{down} =	1500 ft
V_u =	veh/h	Freeway Volume, V_F	8190	V_D =	623 veh/h
		Ramp Volume, V_R	1507		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8190	0.92	Level	8	0	0.962	1.00	9258
Ramp	1507	0.92	Level	8	0	0.962	1.00	1704
UpStream								
DownStream	623	0.92	Level	2	0	0.990	1.00	684

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 using Equation (Exhibit 13-7)

V_{12} = 5105 pc/h

V_3 or V_{av34} 4153 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 6558 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9258	Exhibit 13-8	7200	Yes
$V_{FO} = V_F - V_R$	7554	Exhibit 13-8	7200	Yes
V_R	1704	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	5105	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 60.7 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

D_s = 0.451 (Exhibit 13-12)

S_R = 57.4 mph (Exhibit 13-12)

S_0 = 70.2 mph (Exhibit 13-12)

S = 60.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 4	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 2200 ft	Acceleration Lane Length, L_A: 750	L_{down} = ft
V_u = 1356 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 6852	
	Ramp Volume, V_R: 1198	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6852	0.92	Level	2	0	0.990	1.00	7522
Ramp	1198	0.92	Level	10	0	0.952	1.00	1367
UpStream	1356	0.92	Level	9	0	0.957	1.00	1540
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.047 using Equation (Exhibit 13-6)

V_{12} = 353 pc/h

V_3 or V_{av34} = 3584 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 3008 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8889	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4375	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 34.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.563 (Exibit 13-11)

S_R = 54.2 mph (Exhibit 13-11)

S_0 = 63.7 mph (Exhibit 13-11)

S = 58.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	8208	V_D =	1198 veh/h
		Ramp Volume, V_R	1356		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8208	0.92	Level	3	0	0.985	1.00	9056
Ramp	1356	0.92	Level	9	0	0.957	1.00	1540
UpStream								
DownStream	1198	0.92	Level	10	0	0.952	1.00	1367

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4817 pc/h

V_3 or V_{av34} 2119 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9056	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7516	Exhibit 13-8	9600	No
V_R	1540	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4817	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 44.1 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.437 (Exhibit 13-12)

S_R = 57.8 mph (Exhibit 13-12)

S_0 = 72.4 mph (Exhibit 13-12)

S = 63.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 4	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2115 ft
V_u = veh/h	Deceleration Lane Length L_D: 220	V_D = 838 veh/h
	Freeway Volume, V_F: 8225	
	Ramp Volume, V_R: 1110	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	8225	0.92	Level	4	0	0.980	1.00	9119
Ramp	1110	0.92	Level	9	0	0.957	1.00	1261
UpStream								
DownStream	838	0.92	Level	20	0	0.909	1.00	1002

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4687 pc/h

V_3 or V_{av34} 2216 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	9119	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	7858	Exhibit 13-8	9600	No
V_R	1261	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4687	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 42.6 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.411 (Exhibit 13-12)

S_R= 58.5 mph (Exhibit 13-12)

S_0= 72.0 mph (Exhibit 13-12)

S = 64.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 2115 ft
V_u = 1110 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	7115
Ramp Volume, V_R	838
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7115	0.92	Level	3	0	0.985	1.00	7850
Ramp	838	0.92	Level	20	0	0.909	1.00	1002
UpStream	1110	0.92	Level	9	0	0.957	1.00	1261
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 0.093 using Equation (Exhibit 13-6)
V_{12} = 727 pc/h
V_3 or V_{av34} = 3561 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
If Yes, V_{12a} = 3140 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8852	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4142	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 34.2 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.521 (Exibit 13-11)
S_R = 55.4 mph (Exhibit 13-11)
S_0 = 63.1 mph (Exhibit 13-11)
S = 59.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R = mph (Exhibit 13-12)
S_0 = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	1930 ft
V_u =	veh/h	Freeway Volume, V_F	4355	V_D =	1631 veh/h
		Ramp Volume, V_R	1020		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4355	0.92	Level	11	0	0.948	1.00	4994
Ramp	1020	0.92	Level	6	0	0.971	1.00	1142
UpStream								
DownStream	1631	0.92	Level	5	0	0.976	1.00	1817

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.583 using Equation (Exhibit 13-7)

V_{12} = 3386 pc/h

V_3 or V_{av34} 1608 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4994	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3852	Exhibit 13-8	7200	No
V_R	1142	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3386	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.401 (Exhibit 13-12)

S_R = 58.8 mph (Exhibit 13-12)

S_0 = 74.4 mph (Exhibit 13-12)

S = 63.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	1930 ft	Acceleration Lane Length, L_A	675	L_{down} =	ft
V_u =	1020 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	3335		
		Ramp Volume, V_R	1631		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3335	0.92	Level	12	0	0.943	1.00	3842
Ramp	1631	0.92	Level	5	0	0.976	1.00	1817
UpStream	1020	0.92	Level	6	0	0.971	1.00	1142
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1462.13 (Equation 13-6 or 13-7)

P_{FM} = 0.596 using Equation (Exhibit 13-6)

V_{12} = 2291 pc/h

V_3 or V_{av34} = 1551 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2291 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5659	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4108	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 32.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.497 (Exibit 13-11)

S_R = 56.1 mph (Exhibit 13-11)

S_0 = 66.2 mph (Exhibit 13-11)

S = 58.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp Inputs		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2010 ft	Acceleration Lane Length, L_A	700	L_{down} =	ft
V_u =	1516 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	3584		
		Ramp Volume, V_R	720		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3584	0.92	Level	1	0	0.995	1.00	3915
Ramp	720	0.92	Level	8	0	0.962	1.00	814
UpStream	1516	0.92	Level	5	0	0.976	1.00	1689
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1274.21 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 2338 pc/h

V_3 or V_{av34} = 1577 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2338 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4729	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3152	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.349 (Exibit 13-11)

S_R = 60.2 mph (Exhibit 13-11)

S_0 = 66.1 mph (Exhibit 13-11)

S = 62.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 2010 ft
V_u = veh/h	Deceleration Lane Length L_D: 200	V_D = 720 veh/h
	Freeway Volume, V_F: 5100	
	Ramp Volume, V_R: 1516	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5100	0.92	Level	2	0	0.990	1.00	5599
Ramp	1516	0.92	Level	5	0	0.976	1.00	1689
UpStream								
DownStream	720	0.92	Level	8	0	0.962	1.00	814

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.542 using Equation (Exhibit 13-7)

V_{12} = 3810 pc/h

V_3 or V_{av34} 1789 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5599	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3910	Exhibit 13-8	7200	No
V_R	1689	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3810	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 35.2 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.450 (Exhibit 13-12)

S_R = 57.4 mph (Exhibit 13-12)

S_0 = 73.7 mph (Exhibit 13-12)

S = 61.8 mph (Exhibit 13-13)

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APPENDIX 9.11:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	729	1338	772	432	510	261
Future Volume (vph)	729	1338	772	432	510	261
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	39.0	81.0	42.0	42.0	39.0	39.0
Total Split (%)	32.5%	67.5%	35.0%	35.0%	32.5%	32.5%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	32.4	74.5	37.1	37.1	33.0	33.0
Actuated g/C Ratio	0.27	0.62	0.31	0.31	0.28	0.28
v/c Ratio	0.91	0.63	0.73	0.76	0.83	0.75
Control Delay	69.8	12.0	41.9	33.4	58.5	42.7
Queue Delay	0.0	0.0	2.1	0.9	0.0	0.0
Total Delay	69.8	12.0	44.0	34.3	58.5	42.7
LOS	E	B	D	C	E	D
Approach Delay		32.4	40.5			48.0
Approach LOS		C	D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 38.3	Intersection LOS: D
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	729	1338	0	0	772	432	510	261	228	0	0	0
Future Volume (veh/h)	729	1338	0	0	772	432	510	261	228	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1900	0	0	1900	1900	1800	1900	1900			
Adj Flow Rate, veh/h	767	1408	0	0	813	454	350	537	237			
Adj No. of Lanes	2	2	0	0	2	1	1	2	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	828	2241	0	0	1139	501	471	689	303			
Arrive On Green	0.26	0.62	0.00	0.00	0.32	0.32	0.28	0.28	0.28			
Sat Flow, veh/h	3141	3705	0	0	3705	1587	1714	2504	1102			
Grp Volume(v), veh/h	767	1408	0	0	813	454	350	407	367			
Grp Sat Flow(s),veh/h/ln	1570	1805	0	0	1805	1587	1714	1900	1706			
Q Serve(g_s), s	28.5	29.1	0.0	0.0	23.9	32.9	22.3	23.7	23.8			
Cycle Q Clear(g_c), s	28.5	29.1	0.0	0.0	23.9	32.9	22.3	23.7	23.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.65			
Lane Grp Cap(c), veh/h	828	2241	0	0	1139	501	471	523	469			
V/C Ratio(X)	0.93	0.63	0.00	0.00	0.71	0.91	0.74	0.78	0.78			
Avail Cap(c_a), veh/h	890	2241	0	0	1139	501	471	523	469			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.85	0.85	0.00	0.00	0.58	0.58	1.00	1.00	1.00			
Uniform Delay (d), s/veh	43.0	14.1	0.0	0.0	36.3	39.4	39.6	40.1	40.2			
Incr Delay (d2), s/veh	13.0	1.1	0.0	0.0	2.3	15.0	10.1	10.9	12.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	13.9	14.6	0.0	0.0	12.2	16.5	11.9	14.0	12.8			
LnGrp Delay(d),s/veh	56.1	15.3	0.0	0.0	38.5	54.4	49.7	51.1	52.4			
LnGrp LOS	E	B			D	D	D	D	D			
Approach Vol, veh/h		2175			1267			1124				
Approach Delay, s/veh		29.7			44.2			51.1				
Approach LOS		C			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		81.0			36.6	44.4		39.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		74.5			34.0	35.5		33.0
Max Q Clear Time (g_c+I1), s		31.1			30.5	34.9		25.8
Green Ext Time (p_c), s		28.5			1.1	0.6		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	39.0
HCM 2010 LOS	D

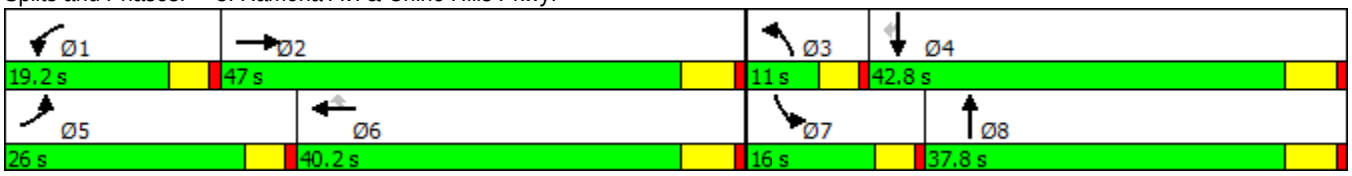
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	500	1057	142	850	125	28	459	108	369	327
Future Volume (vph)	500	1057	142	850	125	28	459	108	369	327
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	26.0	47.0	19.2	40.2	40.2	11.0	37.8	16.0	42.8	42.8
Total Split (%)	21.7%	39.2%	16.0%	33.5%	33.5%	9.2%	31.5%	13.3%	35.7%	35.7%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	20.5	40.6	13.0	33.1	33.1	5.9	32.1	10.4	40.6	40.6
Actuated g/C Ratio	0.18	0.35	0.11	0.28	0.28	0.05	0.27	0.09	0.35	0.35
v/c Ratio	0.90	0.62	0.78	0.88	0.22	0.34	0.71	0.75	0.31	0.44
Control Delay	67.9	33.8	78.7	51.0	1.8	65.6	40.3	82.2	30.3	5.2
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	34.7	78.7	51.0	1.8	65.6	40.3	82.2	30.3	5.2
LOS	E	C	E	D	A	E	D	F	C	A
Approach Delay		45.3		49.0			41.3		27.1	
Approach LOS		D		D			D		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 116.9
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 42.1 — Intersection LOS: D
Intersection Capacity Utilization 89.0% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	1057	9	142	850	125	28	459	207	108	369	327
Future Volume (veh/h)	500	1057	9	142	850	125	28	459	207	108	369	327
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	526	1113	8	149	895	115	29	483	150	114	388	248
Adj No. of Lanes	2	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	579	1915	14	175	1041	459	45	749	231	139	1196	526
Arrive On Green	0.17	0.36	0.36	0.10	0.29	0.29	0.03	0.28	0.28	0.08	0.33	0.33
Sat Flow, veh/h	3326	5312	38	1714	3610	1591	1714	2708	835	1714	3610	1588
Grp Volume(v), veh/h	526	724	397	149	895	115	29	321	312	114	388	248
Grp Sat Flow(s),veh/h/ln	1663	1729	1893	1714	1805	1591	1714	1805	1738	1714	1805	1588
Q Serve(g_s), s	17.9	19.6	19.6	9.9	27.1	6.4	1.9	18.1	18.3	7.6	9.3	14.3
Cycle Q Clear(g_c), s	17.9	19.6	19.6	9.9	27.1	6.4	1.9	18.1	18.3	7.6	9.3	14.3
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	579	1246	682	175	1041	459	45	499	481	139	1196	526
V/C Ratio(X)	0.91	0.58	0.58	0.85	0.86	0.25	0.65	0.64	0.65	0.82	0.32	0.47
Avail Cap(c_a), veh/h	615	1246	682	216	1074	473	95	499	481	169	1196	526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.8	29.9	29.9	51.0	38.9	31.6	55.8	36.8	36.9	52.3	29.0	30.7
Incr Delay (d2), s/veh	16.1	0.8	1.5	19.3	7.3	0.4	5.7	6.2	6.7	19.5	0.7	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	9.5	10.5	5.6	14.6	2.9	1.0	9.9	9.6	4.3	4.8	6.7
LnGrp Delay(d),s/veh	63.0	30.8	31.5	70.3	46.2	32.0	61.4	43.0	43.5	71.8	29.7	33.7
LnGrp LOS	E	C	C	E	D	C	E	D	D	E	C	C
Approach Vol, veh/h		1647			1159			662			750	
Approach Delay, s/veh		41.2			47.9			44.1			37.4	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	47.5	7.6	44.1	24.8	39.2	13.9	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	14.6	41.2	6.4	37.0	21.4	34.4	11.4	32.0
Max Q Clear Time (g_c+I1), s	11.9	21.6	3.9	16.3	19.9	29.1	9.6	20.3
Green Ext Time (p_c), s	0.0	15.6	0.0	7.0	0.2	4.2	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	42.8
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	1077	166	44	898	142
Future Volume (vph)	1077	166	44	898	142
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	2		1	6	8
Permitted Phases		2			
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	24.8	24.8	9.6	15.8	26.1
Total Split (s)	29.3	29.3	9.6	38.9	26.1
Total Split (%)	45.1%	45.1%	14.8%	59.8%	40.2%
Yellow Time (s)	4.8	4.8	3.6	4.8	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	5.8	5.1
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	23.2	23.2	5.2	26.4	12.8
Actuated g/C Ratio	0.46	0.46	0.10	0.52	0.25
v/c Ratio	0.71	0.22	0.28	0.52	0.45
Control Delay	16.7	3.4	29.2	9.3	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	3.4	29.2	9.3	18.5
LOS	B	A	C	A	B
Approach Delay	14.9			10.3	18.5
Approach LOS	B			B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 50.4	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Monte Vista Av. & Chino Hills Pkwy.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1077	166	44	898	142	41
Future Volume (veh/h)	1077	166	44	898	142	41
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1184	182	48	987	156	45
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1625	727	83	2126	254	73
Arrive On Green	0.45	0.45	0.05	0.59	0.20	0.20
Sat Flow, veh/h	3705	1615	1714	3705	1290	372
Grp Volume(v), veh/h	1184	182	48	987	202	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1714	1805	1670	0
Q Serve(g_s), s	13.6	3.6	1.4	7.9	5.6	0.0
Cycle Q Clear(g_c), s	13.6	3.6	1.4	7.9	5.6	0.0
Prop In Lane		1.00	1.00		0.77	0.22
Lane Grp Cap(c), veh/h	1625	727	83	2126	328	0
V/C Ratio(X)	0.73	0.25	0.58	0.46	0.62	0.00
Avail Cap(c_a), veh/h	1668	746	169	2349	690	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.4	8.7	23.7	5.9	18.7	0.0
Incr Delay (d2), s/veh	1.8	0.3	2.4	0.2	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	1.6	0.7	3.9	2.8	0.0
LnGrp Delay(d),s/veh	13.2	8.9	26.0	6.1	20.5	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	1366			1035	202	
Approach Delay, s/veh	12.6			7.1	20.5	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.1	28.7				35.8		15.1
Change Period (Y+Rc), s	4.6	5.8				5.8		5.1
Max Green Setting (Gmax), s	5.0	23.5				33.1		21.0
Max Q Clear Time (g_c+I1), s	3.4	15.6				9.9		7.6
Green Ext Time (p_c), s	0.0	7.2				19.5		0.5

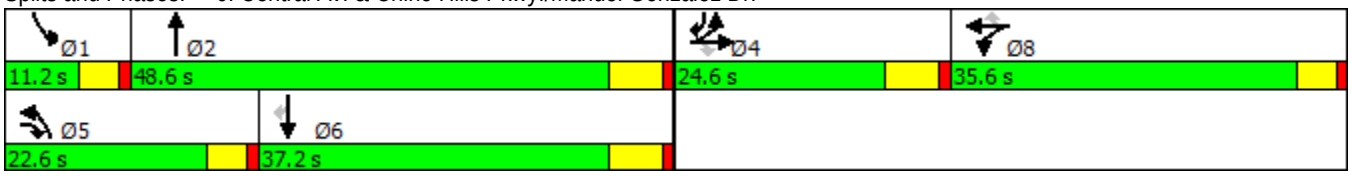
Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	439	60	317	2	4	8	469	1078	74	884	288
Future Volume (vph)	439	60	317	2	4	8	469	1078	74	884	288
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Prot	NA	pm+ov
Protected Phases	4	4	5	8	8		5	2	1	6	4
Permitted Phases			4			8					6
Detector Phase	4	4	5	8	8	8	5	2	1	6	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	9.6	30.8	15.8
Total Split (s)	24.6	24.6	22.6	35.6	35.6	35.6	22.6	48.6	11.2	37.2	24.6
Total Split (%)	20.5%	20.5%	18.8%	29.7%	29.7%	29.7%	18.8%	40.5%	9.3%	31.0%	20.5%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max	None	Max	None
Act Effct Green (s)	19.2	19.2	41.8	13.5	13.5	13.5	18.3	43.6	6.7	32.0	51.2
Actuated g/C Ratio	0.20	0.20	0.44	0.14	0.14	0.14	0.19	0.46	0.07	0.34	0.54
v/c Ratio	0.81	0.78	0.38	0.01	0.01	0.02	0.79	0.74	0.66	0.79	0.32
Control Delay	58.5	54.5	2.8	35.5	35.5	0.1	48.2	26.6	72.0	35.7	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	54.5	2.8	35.5	35.5	0.1	48.2	26.6	72.0	35.7	5.1
LOS	E	D	A	D	D	A	D	C	E	D	A
Approach Delay		35.6			14.3			32.9		30.8	
Approach LOS		D			B			C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 32.7	Intersection LOS: C
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	439	60	317	2	4	8	469	1078	51	74	884	288
Future Volume (veh/h)	439	60	317	2	4	8	469	1078	51	74	884	288
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	523	0	249	2	4	4	510	1172	43	80	961	258
Adj No. of Lanes	2	0	1	1	1	1	2	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	630	0	582	42	47	40	587	1749	64	101	1356	896
Arrive On Green	0.18	0.00	0.18	0.02	0.02	0.02	0.18	0.49	0.49	0.06	0.38	0.38
Sat Flow, veh/h	3429	0	1615	1714	1900	1615	3326	3549	130	1714	3610	1595
Grp Volume(v), veh/h	523	0	249	2	4	4	510	596	619	80	961	258
Grp Sat Flow(s),veh/h/ln	1714	0	1615	1714	1900	1615	1663	1805	1874	1714	1805	1595
Q Serve(g_s), s	12.8	0.0	10.1	0.1	0.2	0.2	13.0	21.7	21.7	4.0	19.7	7.4
Cycle Q Clear(g_c), s	12.8	0.0	10.1	0.1	0.2	0.2	13.0	21.7	21.7	4.0	19.7	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	630	0	582	42	47	40	587	890	924	101	1356	896
V/C Ratio(X)	0.83	0.00	0.43	0.05	0.09	0.10	0.87	0.67	0.67	0.79	0.71	0.29
Avail Cap(c_a), veh/h	742	0	635	612	678	577	690	890	924	130	1356	896
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	0.0	21.0	41.3	41.4	41.4	34.8	16.7	16.7	40.3	23.1	10.1
Incr Delay (d2), s/veh	6.9	0.0	0.5	0.5	0.8	1.1	9.2	4.0	3.9	16.5	3.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	4.5	0.1	0.1	0.1	6.7	11.7	12.2	2.4	10.3	4.8
LnGrp Delay(d),s/veh	41.0	0.0	21.5	41.8	42.2	42.5	43.9	20.7	20.5	56.8	26.2	10.9
LnGrp LOS	D		C	D	D	D	D	C	C	E	C	B
Approach Vol, veh/h		772			10			1725			1299	
Approach Delay, s/veh		34.7			42.2			27.5			25.1	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	48.6		21.7	19.9	38.4		6.7
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	6.6	42.8		18.8	18.0	31.4		31.0
Max Q Clear Time (g_c+I1), s	6.0	23.7		14.8	15.0	21.7		2.2
Green Ext Time (p_c), s	0.0	16.4		1.2	0.4	8.9		0.0

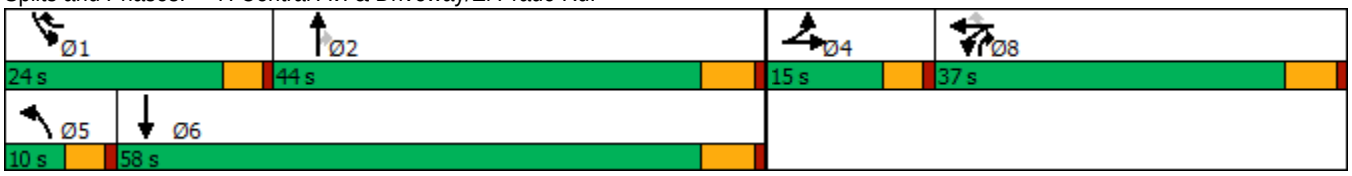
Intersection Summary		
HCM 2010 Ctrl Delay		28.2
HCM 2010 LOS		C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	386	4	214	2	666	403	267	794
Future Volume (vph)	1	1	386	4	214	2	666	403	267	794
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	15.0	15.0	37.0	37.0	24.0	10.0	44.0	37.0	24.0	58.0
Total Split (%)	12.5%	12.5%	30.8%	30.8%	20.0%	8.3%	36.7%	30.8%	20.0%	48.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.3	10.3	18.8	18.8	37.3	5.2	39.5	58.3	12.6	55.3
Actuated g/C Ratio	0.11	0.11	0.21	0.21	0.42	0.06	0.44	0.65	0.14	0.62
v/c Ratio	0.01	0.01	0.63	0.61	0.29	0.02	0.47	0.37	0.64	0.28
Control Delay	45.0	38.5	41.8	40.5	3.2	49.0	21.9	1.4	44.6	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	38.5	41.8	40.5	3.2	49.0	21.9	1.4	44.6	10.7
LOS	D	D	D	D	A	D	C	A	D	B
Approach Delay		40.7		27.7			14.2			19.2
Approach LOS		D		C			B			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 89.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 57.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	386	4	214	2	666	403	267	794	11
Future Volume (veh/h)	1	1	1	386	4	214	2	666	403	267	794	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	1	1	1	432	0	95	2	740	279	297	882	10
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	14	7	7	558	0	446	5	1733	1028	378	3125	35
Arrive On Green	0.01	0.01	0.01	0.16	0.00	0.16	0.00	0.48	0.48	0.11	0.59	0.59
Sat Flow, veh/h	1714	873	873	3429	0	1615	1714	3610	1595	3326	5288	60
Grp Volume(v), veh/h	1	0	2	432	0	95	2	740	279	297	577	315
Grp Sat Flow(s),veh/h/ln	1714	0	1746	1714	0	1615	1714	1805	1595	1663	1729	1889
Q Serve(g_s), s	0.1	0.0	0.1	10.7	0.0	4.0	0.1	11.8	6.7	7.7	7.2	7.2
Cycle Q Clear(g_c), s	0.1	0.0	0.1	10.7	0.0	4.0	0.1	11.8	6.7	7.7	7.2	7.2
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	14	0	14	558	0	446	5	1733	1028	378	2044	1117
V/C Ratio(X)	0.07	0.00	0.14	0.77	0.00	0.21	0.43	0.43	0.27	0.78	0.28	0.28
Avail Cap(c_a), veh/h	202	0	206	1211	0	754	105	1733	1028	731	2044	1117
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	0.0	43.5	35.4	0.0	24.6	44.0	15.0	6.8	38.1	8.9	8.9
Incr Delay (d2), s/veh	0.8	0.0	1.7	2.3	0.0	0.2	21.7	0.8	0.7	1.4	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	5.2	0.0	1.8	0.1	6.0	4.4	3.6	3.5	4.0
LnGrp Delay(d),s/veh	44.3	0.0	45.2	37.8	0.0	24.8	65.6	15.8	7.5	39.4	9.2	9.5
LnGrp LOS	D		D	D		C	E	B	A	D	A	A
Approach Vol, veh/h		3			527			1021			1189	
Approach Delay, s/veh		44.9			35.4			13.6			16.8	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.6	48.2		5.3	4.8	58.0		20.2
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	19.4	38.2		10.4	5.4	52.2		31.2
Max Q Clear Time (g_c+I1), s	9.7	13.8		2.1	2.1	9.2		12.7
Green Ext Time (p_c), s	0.4	8.6		0.0	0.0	9.3		1.7

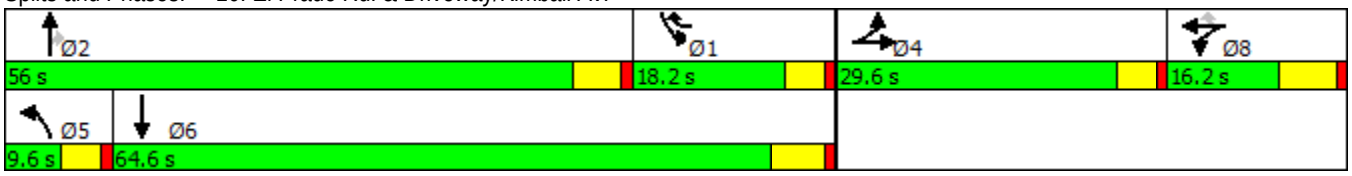
Intersection Summary			
HCM 2010 Ctrl Delay		19.2	
HCM 2010 LOS		B	

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	1	30	515	6	35	56	534	59
Future Volume (vph)	13	1	30	515	6	35	56	534	59
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	18.2	9.6	56.0	56.0	18.2	64.6
Total Split (%)	24.7%	24.7%	13.5%	15.2%	8.0%	46.7%	46.7%	15.2%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.6	12.6	10.4	29.4	5.2	10.4	10.4	14.1	18.6
Actuated g/C Ratio	0.22	0.22	0.18	0.50	0.09	0.18	0.18	0.24	0.32
v/c Ratio	0.04	0.01	0.38	0.49	0.04	0.11	0.15	0.68	0.19
Control Delay	20.1	16.0	29.1	2.8	31.3	26.2	0.8	28.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	16.0	29.1	2.8	31.3	26.2	0.8	28.9	13.1
LOS	C	B	C	A	C	C	A	C	B
Approach Delay		19.3	7.8			11.9			26.2
Approach LOS		B	A			B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 58.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	2	91	30	515	6	35	56	534	59	49
Future Volume (veh/h)	13	1	2	91	30	515	6	35	56	534	59	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	13	1	1	93	31	271	6	36	57	545	60	50
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	64	33	33	249	83	621	156	345	294	676	292	244
Arrive On Green	0.04	0.04	0.04	0.18	0.18	0.18	0.09	0.18	0.18	0.20	0.31	0.31
Sat Flow, veh/h	1714	873	873	1373	458	1615	1714	1900	1615	3326	959	799
Grp Volume(v), veh/h	13	0	2	124	0	271	6	36	57	545	0	110
Grp Sat Flow(s),veh/h/ln	1714	0	1746	1831	0	1615	1714	1900	1615	1663	0	1757
Q Serve(g_s), s	0.4	0.0	0.1	3.3	0.0	0.0	0.2	0.9	1.6	8.6	0.0	2.6
Cycle Q Clear(g_c), s	0.4	0.0	0.1	3.3	0.0	0.0	0.2	0.9	1.6	8.6	0.0	2.6
Prop In Lane	1.00		0.50	0.75		1.00	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	64	0	65	332	0	621	156	345	294	676	0	536
V/C Ratio(X)	0.20	0.00	0.03	0.37	0.00	0.44	0.04	0.10	0.19	0.81	0.00	0.21
Avail Cap(c_a), veh/h	779	0	793	333	0	622	156	1755	1491	822	0	1879
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	25.5	19.8	0.0	12.5	22.8	18.8	19.1	20.9	0.0	14.2
Incr Delay (d2), s/veh	1.6	0.0	0.2	0.7	0.0	0.5	0.0	0.1	0.3	4.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.7	0.0	3.1	0.1	0.5	0.8	4.3	0.0	1.3
LnGrp Delay(d),s/veh	27.2	0.0	25.7	20.5	0.0	13.0	22.8	18.9	19.4	24.9	0.0	14.4
LnGrp LOS	C		C	C		B	C	B	B	C		B
Approach Vol, veh/h		15			395			99			655	
Approach Delay, s/veh		27.0			15.3			19.4			23.1	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	17.0	15.2		6.6	9.6	22.6		16.2
Change Period (Y+Rc), s	5.8	* 5.2		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	13.6	* 51		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	10.6	3.6		2.4	2.2	4.6		5.3
Green Ext Time (p_c), s	0.6	0.4		0.0	0.0	1.5		0.7

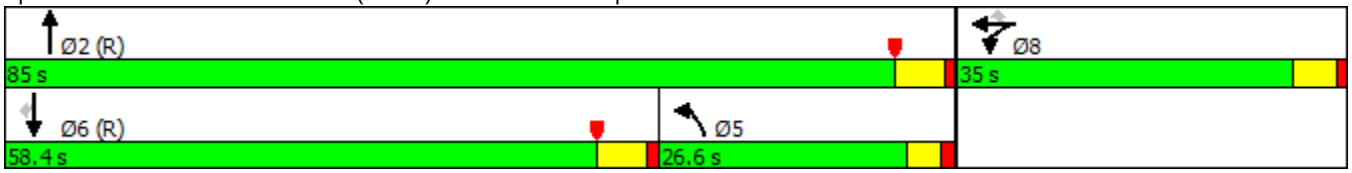
Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	616	2	401	532	1469	1429	796
Future Volume (vph)	616	2	401	532	1469	1429	796
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	35.0	35.0	35.0	26.6	85.0	58.4	58.4
Total Split (%)	29.2%	29.2%	29.2%	22.2%	70.8%	48.7%	48.7%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lag		Lead	Lead
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	29.2	29.2	29.2	21.9	80.3	53.9	53.9
Actuated g/C Ratio	0.24	0.24	0.24	0.18	0.67	0.45	0.45
v/c Ratio	0.95	0.93	0.81	0.95	0.65	0.95	0.82
Control Delay	80.3	74.5	48.8	55.2	4.4	45.4	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.9	30.7	0.0
Total Delay	80.3	74.5	48.8	55.2	5.3	76.1	15.2
LOS	F	E	D	E	A	E	B
Approach Delay		68.4			18.6	54.3	
Approach LOS		E			B	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 107 (89%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 43.4	Intersection LOS: D
Intersection Capacity Utilization 100.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	616	2	401	532	1469	0	0	1429	796
Future Volume (veh/h)	0	0	0	616	2	401	532	1469	0	0	1429	796
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1800	1900	1900	1800	1900	0	0	1900	1900
Adj Flow Rate, veh/h				749	0	185	572	1580	0	0	1537	856
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				808	0	380	633	2444	0	0	1591	697
Arrive On Green				0.24	0.00	0.24	0.38	1.00	0.00	0.00	0.44	0.44
Sat Flow, veh/h				3429	0	1615	3326	3705	0	0	3705	1582
Grp Volume(v), veh/h				749	0	185	572	1580	0	0	1537	856
Grp Sat Flow(s),veh/h/ln				1714	0	1615	1663	1805	0	0	1805	1582
Q Serve(g_s), s				25.6	0.0	11.9	19.5	0.0	0.0	0.0	49.8	52.9
Cycle Q Clear(g_c), s				25.6	0.0	11.9	19.5	0.0	0.0	0.0	49.8	52.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				808	0	380	633	2444	0	0	1591	697
V/C Ratio(X)				0.93	0.00	0.49	0.90	0.65	0.00	0.00	0.97	1.23
Avail Cap(c_a), veh/h				857	0	404	633	2444	0	0	1591	697
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.42	0.42	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				44.9	0.0	39.6	36.1	0.0	0.0	0.0	32.7	33.5
Incr Delay (d2), s/veh				15.0	0.0	0.4	7.8	0.6	0.0	0.0	15.8	114.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				13.9	0.0	5.3	9.6	0.2	0.0	0.0	28.2	45.3
LnGrp Delay(d),s/veh				59.8	0.0	40.0	43.9	0.6	0.0	0.0	48.4	148.3
LnGrp LOS				E		D	D	A			D	F
Approach Vol, veh/h					934			2152			2393	
Approach Delay, s/veh					55.9			12.1			84.1	
Approach LOS					E			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		86.7			28.3	58.4		33.3
Change Period (Y+Rc), s		5.5			5.5	* 5.5		5.0
Max Green Setting (Gmax), s		79.5			22.1	* 53		30.0
Max Q Clear Time (g_c+I1), s		2.0			21.5	54.9		27.6
Green Ext Time (p_c), s		34.4			0.1	0.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	51.0
HCM 2010 LOS	D

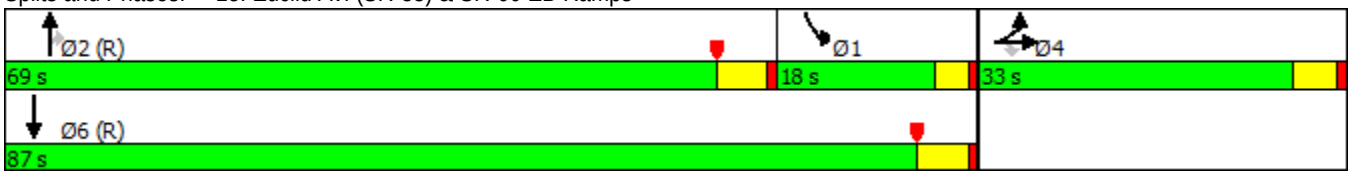
Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	423	0	398	1578	767	313	1732
Future Volume (vph)	423	0	398	1578	767	313	1732
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	33.0	33.0	33.0	69.0	69.0	18.0	87.0
Total Split (%)	27.5%	27.5%	27.5%	57.5%	57.5%	15.0%	72.5%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	25.4	25.4	25.4	66.4	66.4	13.7	84.1
Actuated g/C Ratio	0.21	0.21	0.21	0.55	0.55	0.11	0.70
v/c Ratio	0.88	0.76	0.73	0.84	0.70	0.88	0.73
Control Delay	71.5	45.8	43.8	15.2	8.4	68.9	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	41.8
Total Delay	71.5	45.8	43.8	15.2	8.4	68.9	55.2
LOS	E	D	D	B	A	E	E
Approach Delay		54.0		13.0			57.3
Approach LOS		D		B			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 36.9 — Intersection LOS: D
Intersection Capacity Utilization 100.1% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	423	0	398	0	0	0	0	1578	767	313	1732	0
Future Volume (veh/h)	423	0	398	0	0	0	0	1578	767	313	1732	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900				0	1900	1900	1800	1900	0
Adj Flow Rate, veh/h	556	0	227				0	1679	816	333	1843	0
Adj No. of Lanes	2	0	1				0	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	628	0	296				0	1630	727	771	2632	0
Arrive On Green	0.18	0.00	0.18				0.00	0.90	0.90	0.46	1.00	0.00
Sat Flow, veh/h	3429	0	1615				0	3705	1611	3326	3705	0
Grp Volume(v), veh/h	556	0	227				0	1679	816	333	1843	0
Grp Sat Flow(s),veh/h/ln	1714	0	1615				0	1805	1611	1663	1805	0
Q Serve(g_s), s	19.0	0.0	16.0				0.0	54.2	54.2	8.1	0.0	0.0
Cycle Q Clear(g_c), s	19.0	0.0	16.0				0.0	54.2	54.2	8.1	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	628	0	296				0	1630	727	771	2632	0
V/C Ratio(X)	0.88	0.00	0.77				0.00	1.03	1.12	0.43	0.70	0.00
Avail Cap(c_a), veh/h	800	0	377				0	1910	852	771	2632	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.09	0.09	0.21	0.21	0.00
Uniform Delay (d), s/veh	47.8	0.0	46.6				0.0	5.8	5.8	26.9	0.0	0.0
Incr Delay (d2), s/veh	8.3	0.0	5.1				0.0	16.5	57.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	0.0	7.5				0.0	26.3	31.7	3.7	0.1	0.0
LnGrp Delay(d),s/veh	56.1	0.0	51.7				0.0	22.3	62.9	26.9	0.3	0.0
LnGrp LOS	E		D					F	F	C	A	
Approach Vol, veh/h		783						2495			2176	
Approach Delay, s/veh		54.8						35.6			4.4	
Approach LOS		D						D			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	28.9	64.1		27.0		93.0		
Change Period (Y+Rc), s	5.5	* 5.5		5.0		5.5		
Max Green Setting (Gmax), s	14.0	* 64		28.0		81.5		
Max Q Clear Time (g_c+I1), s	10.1	56.2		21.0		2.0		
Green Ext Time (p_c), s	3.0	6.9		1.0		44.3		

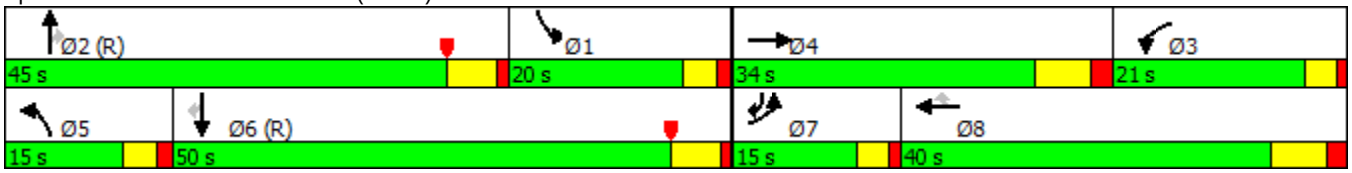
Intersection Summary	
HCM 2010 Ctrl Delay	25.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	189	501	268	507	67	152	1570	336	238	1753	196
Future Volume (vph)	189	501	268	507	67	152	1570	336	238	1753	196
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	15.0	34.0	21.0	40.0	40.0	15.0	45.0	45.0	20.0	50.0	15.0
Total Split (%)	12.5%	28.3%	17.5%	33.3%	33.3%	12.5%	37.5%	37.5%	16.7%	41.7%	12.5%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.0	26.7	17.3	33.0	33.0	10.5	39.5	39.5	15.5	44.5	61.0
Actuated g/C Ratio	0.09	0.22	0.14	0.28	0.28	0.09	0.33	0.33	0.13	0.37	0.51
v/c Ratio	1.28	0.91	1.15	0.54	0.13	1.07	0.97	0.49	1.14	0.96	0.23
Control Delay	208.1	59.2	148.3	39.4	0.5	125.3	57.1	20.1	136.3	45.4	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	208.1	59.2	148.3	39.4	0.5	125.3	57.1	20.1	136.3	45.4	14.8
LOS	F	E	F	D	A	F	E	C	F	D	B
Approach Delay		91.2		70.9			56.1			52.6	
Approach LOS		F		E			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 50 (42%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 62.1	Intersection LOS: E
Intersection Capacity Utilization 97.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	501	191	268	507	67	152	1570	336	238	1753	196
Future Volume (veh/h)	189	501	191	268	507	67	152	1570	336	238	1753	196
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	199	527	178	282	534	66	160	1653	273	251	1845	140
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	157	579	195	243	1062	474	150	1707	532	1705	6457	2158
Arrive On Green	0.09	0.22	0.22	0.14	0.29	0.29	0.03	0.11	0.11	0.33	0.41	0.41
Sat Flow, veh/h	1714	2644	889	1714	3610	1613	1714	5187	1615	1714	5187	1615
Grp Volume(v), veh/h	199	359	346	282	534	66	160	1653	273	251	1845	140
Grp Sat Flow(s),veh/h/ln	1714	1805	1728	1714	1805	1613	1714	1729	1615	1714	1729	1615
Q Serve(g_s), s	11.0	23.3	23.5	17.0	14.7	2.6	10.5	38.1	19.1	12.4	0.0	0.0
Cycle Q Clear(g_c), s	11.0	23.3	23.5	17.0	14.7	2.6	10.5	38.1	19.1	12.4	0.0	0.0
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	395	378	243	1062	474	150	1707	532	1705	6457	2158
V/C Ratio(X)	1.27	0.91	0.91	1.16	0.50	0.14	1.07	0.97	0.51	0.15	0.29	0.06
Avail Cap(c_a), veh/h	157	406	389	243	1062	474	150	1707	532	1705	6457	2158
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.59	0.59	0.59	0.23	0.23	0.23
Uniform Delay (d), s/veh	54.5	45.7	45.8	51.5	35.1	15.6	58.3	52.9	44.4	4.4	0.0	0.0
Incr Delay (d2), s/veh	160.5	23.9	25.8	108.3	0.5	0.2	75.0	10.7	2.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	14.2	14.0	15.3	7.4	1.2	8.1	20.0	8.9	0.3	0.0	0.0
LnGrp Delay(d),s/veh	215.0	69.6	71.5	159.8	35.6	15.8	133.3	63.6	46.5	4.4	0.0	0.0
LnGrp LOS	F	E	E	F	D	B	F	E	D	A	A	A
Approach Vol, veh/h		904			882			2086			2236	
Approach Delay, s/veh		102.3			73.8			66.7			0.5	
Approach LOS		F			E			E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	127.3	45.0	24.0	33.3	15.0	157.3	15.0	42.3
Change Period (Y+Rc), s	5.5	* 5.5	7.0	* 7	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	* 40	17.0	* 27	10.5	44.5	11.0	33.0
Max Q Clear Time (g_c+I1), s	14.4	40.1	19.0	25.5	12.5	2.0	13.0	16.7
Green Ext Time (p_c), s	0.2	0.0	0.0	0.8	0.0	22.0	0.0	4.5

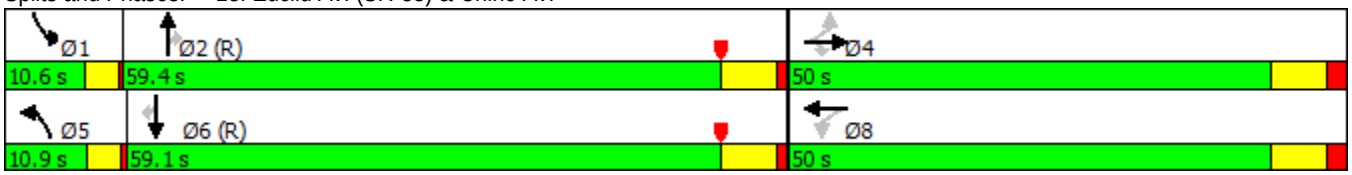
Intersection Summary	
HCM 2010 Ctrl Delay	48.8
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	212	233	82	147	211	87	1761	208	58	2061	128
Future Volume (vph)	212	233	82	147	211	87	1761	208	58	2061	128
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	50.0	50.0	50.0	50.0	50.0	10.9	59.4	59.4	10.6	59.1	59.1
Total Split (%)	41.7%	41.7%	41.7%	41.7%	41.7%	9.1%	49.5%	49.5%	8.8%	49.3%	49.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	38.5	38.5	38.5	38.5	38.5	8.2	59.9	59.9	6.8	56.7	56.7
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.07	0.50	0.50	0.06	0.47	0.47
v/c Ratio	0.99	0.40	0.15	0.52	0.56	0.79	0.72	0.26	0.64	0.88	0.17
Control Delay	98.4	32.9	6.0	38.9	34.3	84.7	28.8	13.4	78.0	10.4	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.4	32.9	6.0	38.9	34.3	84.7	28.8	13.4	78.0	10.4	0.6
LOS	F	C	A	D	C	F	C	B	E	B	A
Approach Delay		55.1			35.8		29.7			11.6	
Approach LOS		E			D		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 103 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 94.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	233	82	147	211	107	87	1761	208	58	2061	128
Future Volume (veh/h)	212	233	82	147	211	107	87	1761	208	58	2061	128
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	223	245	62	155	222	109	92	1854	183	61	2169	106
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	287	681	571	347	432	212	106	2383	742	77	2295	714
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.04	0.31	0.31	0.09	0.88	0.88
Sat Flow, veh/h	1066	1900	1595	1089	1204	591	1714	5187	1615	1714	5187	1613
Grp Volume(v), veh/h	223	245	62	155	0	331	92	1854	183	61	2169	106
Grp Sat Flow(s),veh/h/ln	1066	1900	1595	1089	0	1796	1714	1729	1615	1714	1729	1613
Q Serve(g_s), s	25.0	11.4	3.1	14.7	0.0	17.4	6.4	39.0	10.2	4.2	35.3	1.0
Cycle Q Clear(g_c), s	42.4	11.4	3.1	26.1	0.0	17.4	6.4	39.0	10.2	4.2	35.3	1.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	681	571	347	0	643	106	2383	742	77	2295	714
V/C Ratio(X)	0.78	0.36	0.11	0.45	0.00	0.51	0.87	0.78	0.25	0.79	0.94	0.15
Avail Cap(c_a), veh/h	287	681	571	347	0	643	106	2383	742	101	2295	714
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.80	0.80	0.80	0.13	0.13	0.13
Uniform Delay (d), s/veh	47.0	28.4	25.7	38.0	0.0	30.3	57.0	36.0	26.0	54.1	5.9	3.9
Incr Delay (d2), s/veh	12.5	0.3	0.1	0.9	0.0	0.7	40.9	2.1	0.6	3.0	1.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	6.0	1.4	4.5	0.0	8.8	4.2	19.1	4.7	2.0	15.2	0.4
LnGrp Delay(d),s/veh	59.5	28.7	25.8	38.9	0.0	31.0	97.9	38.0	26.6	57.1	7.5	4.0
LnGrp LOS	E	C	C	D		C	F	D	C	E	A	A
Approach Vol, veh/h		530			486			2129			2336	
Approach Delay, s/veh		41.3			33.5			39.6			8.6	
Approach LOS		D			C			D			A	

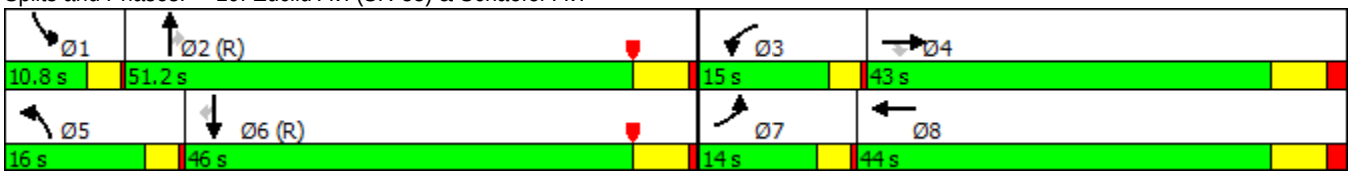
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.9	61.1		50.0	10.9	59.1		50.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.1	53.4		43.0	7.4	53.1		43.0
Max Q Clear Time (g_c+I1), s	6.2	41.0		44.4	8.4	37.3		28.1
Green Ext Time (p_c), s	0.0	12.1		0.0	0.0	15.4		4.5

Intersection Summary	
HCM 2010 Ctrl Delay	26.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	181	79	148	72	155	148	1400	26	40	2180	227
Future Volume (vph)	181	79	148	72	155	148	1400	26	40	2180	227
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	43.0	43.0	15.0	44.0	16.0	51.2	51.2	10.8	46.0	46.0
Total Split (%)	11.7%	35.8%	35.8%	12.5%	36.7%	13.3%	42.7%	42.7%	9.0%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	23.7	23.7	10.6	21.6	14.6	63.0	63.0	7.1	53.8	53.8
Actuated g/C Ratio	0.08	0.20	0.20	0.09	0.18	0.12	0.52	0.52	0.06	0.45	0.45
v/c Ratio	0.74	0.22	0.35	0.51	0.71	0.73	0.55	0.03	0.43	1.00	0.31
Control Delay	70.9	40.8	7.7	64.5	52.5	53.3	15.1	1.3	73.0	40.0	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	40.8	7.7	64.5	52.5	53.3	15.1	1.3	73.0	40.0	7.5
LOS	E	D	A	E	D	D	B	A	E	D	A
Approach Delay		42.2			55.4		18.5			37.5	
Approach LOS		D			E		B			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 32.7	Intersection LOS: C
Intersection Capacity Utilization 86.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	79	148	72	155	72	148	1400	26	40	2180	227
Future Volume (veh/h)	181	79	148	72	155	72	148	1400	26	40	2180	227
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1872	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	193	84	105	77	165	75	157	1489	23	43	2319	193
Adj No. of Lanes	2	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	243	302	257	132	197	89	185	2934	913	54	2560	778
Arrive On Green	0.08	0.16	0.16	0.08	0.16	0.16	0.03	0.19	0.19	0.03	0.49	0.49
Sat Flow, veh/h	3141	1900	1615	1714	1238	563	1783	5187	1615	1714	5187	1577
Grp Volume(v), veh/h	193	84	105	77	0	240	157	1489	23	43	2319	193
Grp Sat Flow(s),veh/h/ln	1570	1900	1615	1714	0	1801	1783	1729	1615	1714	1729	1577
Q Serve(g_s), s	7.2	4.7	7.0	5.2	0.0	15.5	10.5	31.0	1.4	3.0	49.1	8.5
Cycle Q Clear(g_c), s	7.2	4.7	7.0	5.2	0.0	15.5	10.5	31.0	1.4	3.0	49.1	8.5
Prop In Lane	1.00		1.00	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	243	302	257	132	0	286	185	2934	913	54	2560	778
V/C Ratio(X)	0.79	0.28	0.41	0.58	0.00	0.84	0.85	0.51	0.03	0.79	0.91	0.25
Avail Cap(c_a), veh/h	275	570	484	164	0	555	186	2934	913	104	2560	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.51	0.51	0.51	0.44	0.44	0.44
Uniform Delay (d), s/veh	54.4	44.4	45.4	53.5	0.0	49.0	57.0	33.8	21.8	57.7	27.8	17.5
Incr Delay (d2), s/veh	11.5	0.4	0.8	1.5	0.0	4.9	16.2	0.3	0.0	4.2	2.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	2.5	3.2	2.5	0.0	8.1	6.0	15.0	0.6	1.5	24.1	3.8
LnGrp Delay(d),s/veh	66.0	44.8	46.2	55.1	0.0	53.9	73.2	34.1	21.8	61.9	30.6	17.9
LnGrp LOS	E	D	D	E		D	E	C	C	E	C	B
Approach Vol, veh/h		382			317			1669			2555	
Approach Delay, s/veh		55.9			54.2			37.6			30.2	
Approach LOS		E			D			D			C	

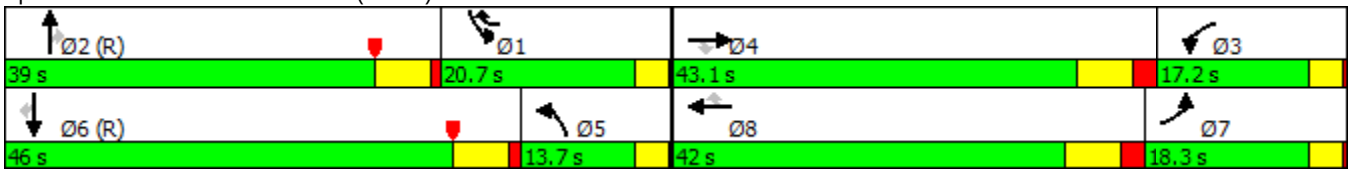
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	73.9	12.7	26.1	15.9	65.2	12.8	26.0
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	7.3	45.2	11.5	36.0	12.5	40.0	10.5	37.0
Max Q Clear Time (g_c+I1), s	5.0	33.0	7.2	9.0	12.5	51.1	9.2	17.5
Green Ext Time (p_c), s	0.0	11.9	0.0	1.6	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	36.2
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	579	267	268	655	367	303	1146	80	363	1861	322
Future Volume (vph)	401	579	267	268	655	367	303	1146	80	363	1861	322
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	8.5	42.0	8.5	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	18.3	43.1	43.1	17.2	42.0	20.7	13.7	39.0	39.0	20.7	46.0	46.0
Total Split (%)	15.3%	35.9%	35.9%	14.3%	35.0%	17.3%	11.4%	32.5%	32.5%	17.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.8	27.1	27.1	21.0	28.3	51.0	10.2	32.7	32.7	19.2	41.7	41.7
Actuated g/C Ratio	0.16	0.23	0.23	0.18	0.24	0.42	0.08	0.27	0.27	0.16	0.35	0.35
v/c Ratio	0.78	0.72	0.55	0.50	0.78	0.55	1.18	0.76	0.15	0.75	0.97	0.47
Control Delay	59.1	47.5	15.8	49.2	49.0	22.8	162.3	42.5	3.7	47.7	29.6	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	47.5	15.8	49.2	49.0	22.8	162.3	42.5	3.7	47.7	29.6	5.3
LOS	E	D	B	D	D	C	F	D	A	D	C	A
Approach Delay		44.4			41.6			64.2			29.1	
Approach LOS		D			D			E			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 74 (62%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 42.5	Intersection LOS: D
Intersection Capacity Utilization 94.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	579	267	268	655	367	303	1146	80	363	1861	322
Future Volume (veh/h)	401	579	267	268	655	367	303	1146	80	363	1861	322
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1768	1900	1900	1700	1900	1900	1700	1976	1900	1700	1976	1900
Adj Flow Rate, veh/h	427	616	124	285	697	230	322	1219	70	386	1980	237
Adj No. of Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	415	773	329	471	858	759	489	1422	387	792	1976	538
Arrive On Green	0.12	0.20	0.20	0.15	0.23	0.23	0.30	0.48	0.48	0.16	0.22	0.22
Sat Flow, veh/h	3368	3800	1615	3238	3800	1613	3238	5928	1615	3238	5928	1614
Grp Volume(v), veh/h	427	616	124	285	697	230	322	1219	70	386	1980	237
Grp Sat Flow(s),veh/h/ln	1684	1900	1615	1619	1900	1613	1619	1976	1615	1619	1976	1614
Q Serve(g_s), s	14.8	18.5	7.9	9.9	20.9	0.0	10.4	21.8	3.0	13.0	40.0	15.2
Cycle Q Clear(g_c), s	14.8	18.5	7.9	9.9	20.9	0.0	10.4	21.8	3.0	13.0	40.0	15.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	415	773	329	471	858	759	489	1422	387	792	1976	538
V/C Ratio(X)	1.03	0.80	0.38	0.60	0.81	0.30	0.66	0.86	0.18	0.49	1.00	0.44
Avail Cap(c_a), veh/h	415	1143	486	471	1108	865	489	1630	444	792	1976	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89	0.22	0.22	0.22
Uniform Delay (d), s/veh	52.6	45.4	41.2	48.0	44.1	19.6	39.2	29.4	24.5	43.3	46.6	37.0
Incr Delay (d2), s/veh	51.5	2.5	0.7	1.6	3.7	0.2	2.3	6.2	0.9	0.0	10.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	9.9	3.6	4.5	11.4	4.7	4.8	12.5	1.4	5.8	23.7	6.9
LnGrp Delay(d),s/veh	104.1	47.9	42.0	49.6	47.7	19.9	41.5	35.6	25.4	43.4	56.6	37.5
LnGrp LOS	F	D	D	D	D	B	D	D	C	D	F	D
Approach Vol, veh/h		1167			1212			1611			2603	
Approach Delay, s/veh		67.8			42.9			36.3			52.9	
Approach LOS		E			D			D			D	

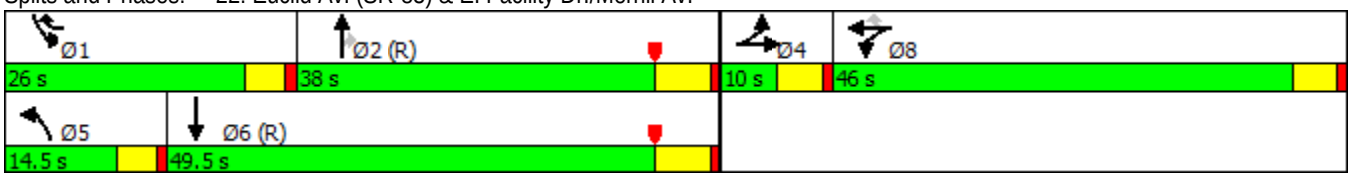
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.8	34.8	21.0	31.4	21.6	46.0	18.3	34.1
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	17.2	33.0	13.7	36.1	10.2	40.0	14.8	35.0
Max Q Clear Time (g_c+I1), s	15.0	23.8	11.9	20.5	12.4	42.0	16.8	22.9
Green Ext Time (p_c), s	0.4	5.0	0.4	3.7	0.0	0.0	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	49.7
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	8	62	465	25	1093	159	473	2037
Future Volume (vph)	8	62	465	25	1093	159	473	2037
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	26.0	14.5	38.0	38.0	26.0	49.5
Total Split (%)	8.3%	38.3%	21.7%	12.1%	31.7%	31.7%	21.7%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	26.4	48.6	10.0	50.4	50.4	21.7	67.9
Actuated g/C Ratio	0.04	0.22	0.40	0.08	0.42	0.42	0.18	0.57
v/c Ratio	0.29	0.76	0.68	0.18	0.51	0.22	0.84	0.75
Control Delay	56.2	55.3	23.3	72.8	23.5	4.8	70.2	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	55.3	23.3	72.8	23.5	4.8	70.2	11.1
LOS	E	E	C	E	C	A	E	B
Approach Delay	56.2	35.7			22.1			22.0
Approach LOS	E	D			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 84.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	8	5	231	62	465	25	1093	159	473	2037	56
Future Volume (veh/h)	10	8	5	231	62	465	25	1093	159	473	2037	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1976	1900	1768	1900	1900
Adj Flow Rate, veh/h	10	8	4	241	65	276	26	1139	140	493	2122	55
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	18	14	7	278	75	576	83	2417	723	544	2944	76
Arrive On Green	0.02	0.02	0.02	0.19	0.19	0.19	0.05	0.45	0.45	0.17	0.57	0.57
Sat Flow, veh/h	819	655	328	1440	388	1591	1714	5394	1615	3267	5200	135
Grp Volume(v), veh/h	22	0	0	306	0	276	26	1139	140	493	1410	767
Grp Sat Flow(s),veh/h/ln	1801	0	0	1828	0	1591	1714	1798	1615	1633	1729	1876
Q Serve(g_s), s	1.5	0.0	0.0	19.5	0.0	16.1	1.8	17.7	6.3	17.8	35.8	36.0
Cycle Q Clear(g_c), s	1.5	0.0	0.0	19.5	0.0	16.1	1.8	17.7	6.3	17.8	35.8	36.0
Prop In Lane	0.45		0.18	0.79		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	39	0	0	353	0	576	83	2417	723	544	1958	1062
V/C Ratio(X)	0.56	0.00	0.00	0.87	0.00	0.48	0.31	0.47	0.19	0.91	0.72	0.72
Avail Cap(c_a), veh/h	75	0	0	625	0	813	143	2417	723	585	1958	1062
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.1	0.0	0.0	46.9	0.0	29.8	55.2	23.2	20.0	49.1	19.1	19.1
Incr Delay (d2), s/veh	4.7	0.0	0.0	2.6	0.0	0.2	0.7	0.6	0.6	16.3	2.3	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	10.1	0.0	7.1	0.9	8.9	2.9	9.2	17.7	19.8
LnGrp Delay(d),s/veh	62.8	0.0	0.0	49.5	0.0	30.0	55.9	23.8	20.6	65.4	21.4	23.4
LnGrp LOS	E			D		C	E	C	C	E	C	C
Approach Vol, veh/h		22			582			1305			2670	
Approach Delay, s/veh		62.8			40.3			24.1			30.1	
Approach LOS		E			D			C			C	

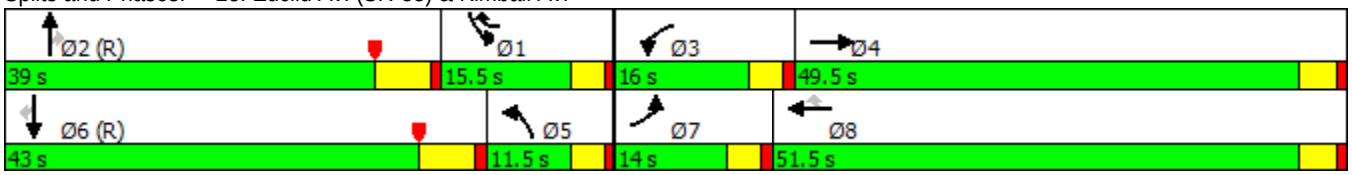
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	24.5	59.8		7.6	10.3	74.0		28.2
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	21.5	32.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	19.8	19.7		3.5	3.8	38.0		21.5
Green Ext Time (p_c), s	0.2	11.4		0.0	0.0	5.3		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	29.8
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	131	239	259	336	225	124	746	152	260	1466	212
Future Volume (vph)	131	239	259	336	225	124	746	152	260	1466	212
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	3	8	1	5	2		1	6	
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	9.0	45.5	9.0	9.0	36.0	36.0	9.0	33.0	33.0
Total Split (s)	14.0	49.5	16.0	51.5	15.5	11.5	39.0	39.0	15.5	43.0	43.0
Total Split (%)	11.7%	41.3%	13.3%	42.9%	12.9%	9.6%	32.5%	32.5%	12.9%	35.8%	35.8%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	20.5	11.6	22.0	46.6	10.3	45.4	45.4	24.1	59.2	59.2
Actuated g/C Ratio	0.08	0.17	0.10	0.18	0.39	0.09	0.38	0.38	0.20	0.49	0.49
v/c Ratio	0.51	0.58	0.80	0.52	0.35	0.88	0.39	0.22	0.42	0.58	0.24
Control Delay	72.6	27.5	71.4	45.5	12.3	102.6	29.2	5.7	29.0	12.8	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.6	27.5	71.4	45.5	12.3	102.6	29.2	5.7	29.0	12.8	1.5
LOS	E	C	E	D	B	F	C	A	C	B	A
Approach Delay		38.9		44.5			34.6			13.7	
Approach LOS		D		D			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 12 (10%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 27.6	Intersection LOS: C
Intersection Capacity Utilization 70.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	239	150	259	336	225	124	746	152	260	1466	212
Future Volume (veh/h)	131	239	150	259	336	225	124	746	152	260	1466	212
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1872	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	134	244	151	264	343	208	127	761	147	265	1496	178
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	259	339	202	319	598	924	500	994	309	1276	1589	488
Arrive On Green	0.14	0.26	0.26	0.09	0.17	0.17	0.29	0.19	0.19	0.41	0.31	0.31
Sat Flow, veh/h	3141	2176	1299	3459	3610	1615	1714	5187	1615	3141	5187	1594
Grp Volume(v), veh/h	134	201	194	264	343	208	127	761	147	265	1496	178
Grp Sat Flow(s),veh/h/ln	1570	1805	1671	1729	1805	1615	1714	1729	1615	1570	1729	1594
Q Serve(g_s), s	4.8	12.1	12.8	9.0	10.5	2.1	6.8	16.7	7.6	6.6	33.7	8.0
Cycle Q Clear(g_c), s	4.8	12.1	12.8	9.0	10.5	2.1	6.8	16.7	7.6	6.6	33.7	8.0
Prop In Lane	1.00		0.78	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	281	260	319	598	924	500	994	309	1276	1589	488
V/C Ratio(X)	0.52	0.71	0.75	0.83	0.57	0.23	0.25	0.77	0.48	0.21	0.94	0.36
Avail Cap(c_a), veh/h	262	677	627	346	1414	1289	500	1426	444	1276	1599	492
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	1.00	1.00	1.00	0.93	0.93	0.93	0.59	0.59	0.59
Uniform Delay (d), s/veh	49.5	42.0	42.2	53.5	46.2	4.9	32.5	46.0	26.4	23.1	40.6	18.8
Incr Delay (d2), s/veh	0.6	2.8	3.5	13.2	0.3	0.0	0.1	5.3	4.8	0.0	8.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	6.3	6.1	4.9	5.3	1.9	3.2	8.4	3.8	2.8	17.3	3.6
LnGrp Delay(d),s/veh	50.2	44.7	45.7	66.7	46.5	5.0	32.6	51.2	31.3	23.1	48.7	20.1
LnGrp LOS	D	D	D	E	D	A	C	D	C	C	D	C
Approach Vol, veh/h		529			815			1035			1939	
Approach Delay, s/veh		46.4			42.4			46.1			42.6	
Approach LOS		D			D			D			D	

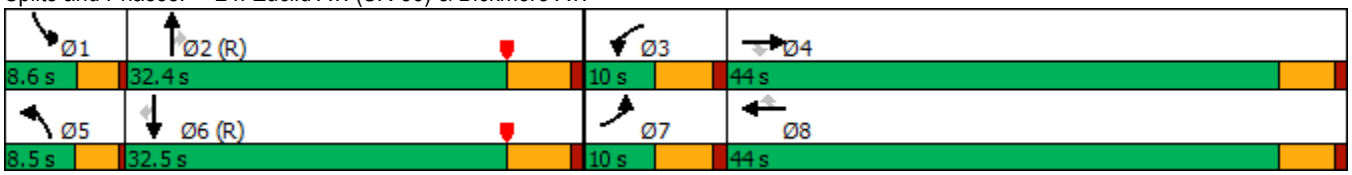
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	52.8	29.0	15.1	23.2	39.0	42.8	13.9	24.4
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.5	33.0	12.0	45.0	7.5	37.0	10.0	47.0
Max Q Clear Time (g_c+I1), s	8.6	18.7	11.0	14.8	8.8	35.7	6.8	12.5
Green Ext Time (p_c), s	0.2	4.3	0.1	3.9	0.0	1.0	0.1	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	43.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	11	21	43	28	60	48	931	41	98	1616	115
Future Volume (vph)	29	11	21	43	28	60	48	931	41	98	1616	115
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	44.0	44.0	10.0	44.0	44.0	8.5	26.5	26.5	8.5	30.5	30.5
Total Split (s)	10.0	44.0	44.0	10.0	44.0	44.0	8.5	32.4	32.4	8.6	32.5	32.5
Total Split (%)	10.5%	46.3%	46.3%	10.5%	46.3%	46.3%	8.9%	34.1%	34.1%	9.1%	34.2%	34.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	5.0	12.3	12.3	5.0	12.3	12.3	6.5	61.0	61.0	6.5	61.0	61.0
Actuated g/C Ratio	0.05	0.13	0.13	0.05	0.13	0.13	0.07	0.64	0.64	0.07	0.64	0.64
v/c Ratio	0.34	0.05	0.07	0.26	0.12	0.20	0.44	0.30	0.04	0.46	0.52	0.11
Control Delay	54.2	29.1	0.4	47.2	32.0	1.5	55.4	13.0	0.1	49.6	16.2	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.2	29.1	0.4	47.2	32.0	1.5	55.4	13.0	0.1	49.6	16.2	4.5
LOS	D	C	A	D	C	A	E	B	A	D	B	A
Approach Delay		31.4			23.0			14.5			17.3	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 8.6 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 56.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	11	21	43	28	60	48	931	41	98	1616	115
Future Volume (veh/h)	29	11	21	43	28	60	48	931	41	98	1616	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	31	12	20	46	30	51	51	990	43	104	1719	113
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	2	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	85	107	90	172	111	94	67	3334	1038	164	3387	1055
Arrive On Green	0.05	0.06	0.06	0.05	0.06	0.06	0.04	0.64	0.64	0.05	0.65	0.65
Sat Flow, veh/h	1714	1900	1606	3326	1900	1615	1714	5187	1615	3326	5187	1615
Grp Volume(v), veh/h	31	12	20	46	30	51	51	990	43	104	1719	113
Grp Sat Flow(s),veh/h/ln	1714	1900	1606	1663	1900	1615	1714	1729	1615	1663	1729	1615
Q Serve(g_s), s	1.7	0.6	1.1	1.3	1.4	2.9	2.8	8.0	0.9	2.9	16.3	2.5
Cycle Q Clear(g_c), s	1.7	0.6	1.1	1.3	1.4	2.9	2.8	8.0	0.9	2.9	16.3	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	107	90	172	111	94	67	3334	1038	164	3387	1055
V/C Ratio(X)	0.36	0.11	0.22	0.27	0.27	0.54	0.76	0.30	0.04	0.63	0.51	0.11
Avail Cap(c_a), veh/h	90	780	659	175	780	663	90	3334	1038	179	3387	1055
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.91	0.75	0.75	0.75
Uniform Delay (d), s/veh	43.7	42.6	42.8	43.3	42.8	43.5	45.2	7.5	6.2	44.3	8.6	6.1
Incr Delay (d2), s/veh	1.0	0.2	0.5	0.3	0.5	1.8	14.1	0.2	0.1	3.3	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.3	0.5	0.6	0.8	1.3	1.6	3.8	0.4	1.4	7.8	1.1
LnGrp Delay(d),s/veh	44.7	42.7	43.3	43.6	43.3	45.3	59.3	7.7	6.3	47.6	9.0	6.3
LnGrp LOS	D	D	D	D	D	D	E	A	A	D	A	A
Approach Vol, veh/h		63			127			1084			1936	
Approach Delay, s/veh		43.9			44.2			10.1			10.9	
Approach LOS		D			D			B			B	

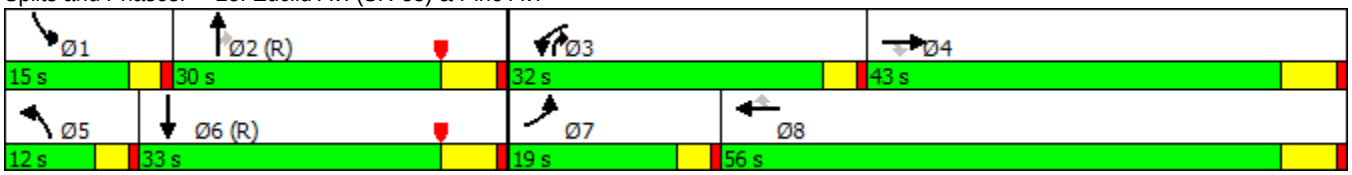
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	66.6	9.9	10.3	7.2	67.5	9.7	10.5
Change Period (Y+Rc), s	3.5	5.5	5.0	5.0	3.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	5.1	26.9	5.0	39.0	5.0	27.0	5.0	39.0
Max Q Clear Time (g_c+I1), s	4.9	10.0	3.3	3.1	4.8	18.3	3.7	4.9
Green Ext Time (p_c), s	0.0	3.7	0.0	0.0	0.0	4.9	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	53	329	199	705	418	187	186	745	518	247	1345
Future Volume (vph)	53	329	199	705	418	187	186	745	518	247	1345
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	19.0	43.0	43.0	32.0	56.0	56.0	12.0	30.0	32.0	15.0	33.0
Total Split (%)	15.8%	35.8%	35.8%	26.7%	46.7%	46.7%	10.0%	25.0%	26.7%	12.5%	27.5%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	8.3	20.9	20.9	27.6	42.1	42.1	11.1	38.3	67.9	13.2	40.4
Actuated g/C Ratio	0.07	0.17	0.17	0.23	0.35	0.35	0.09	0.32	0.57	0.11	0.34
v/c Ratio	0.46	0.53	0.48	0.96	0.33	0.28	0.65	0.46	0.51	0.73	0.84
Control Delay	65.5	46.9	13.4	69.5	29.1	4.2	56.4	34.0	8.8	64.5	42.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	46.9	13.4	69.5	29.1	4.2	56.4	34.0	8.8	64.5	42.8
LOS	E	D	B	E	C	A	E	C	A	E	D
Approach Delay		37.1			47.3			27.9			46.0
Approach LOS		D			D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 9 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 40.1	Intersection LOS: D
Intersection Capacity Utilization 82.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	329	199	705	418	187	186	745	518	247	1345	89
Future Volume (veh/h)	53	329	199	705	418	187	186	745	518	247	1345	89
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1768	1900	1900	1700	1900	1976	1700	1900	1900
Adj Flow Rate, veh/h	54	332	0	712	422	174	188	753	345	249	1359	85
Adj No. of Lanes	1	2	1	2	2	1	2	3	1	2	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	69	599	268	756	1290	570	209	1786	959	288	1841	115
Arrive On Green	0.04	0.17	0.00	0.23	0.36	0.36	0.07	0.34	0.34	0.09	0.37	0.37
Sat Flow, veh/h	1714	3610	1615	3267	3610	1595	3141	5187	1657	3141	4986	312
Grp Volume(v), veh/h	54	332	0	712	422	174	188	753	345	249	942	502
Grp Sat Flow(s),veh/h/ln	1714	1805	1615	1633	1805	1595	1570	1729	1657	1570	1729	1840
Q Serve(g_s), s	3.7	10.1	0.0	25.7	10.2	9.4	7.1	13.4	13.4	9.4	28.4	28.4
Cycle Q Clear(g_c), s	3.7	10.1	0.0	25.7	10.2	9.4	7.1	13.4	13.4	9.4	28.4	28.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	69	599	268	756	1290	570	209	1786	959	288	1277	680
V/C Ratio(X)	0.78	0.55	0.00	0.94	0.33	0.31	0.90	0.42	0.36	0.86	0.74	0.74
Avail Cap(c_a), veh/h	214	1113	498	762	1504	664	209	1786	959	288	1277	680
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	0.10	0.10	0.10	0.85	0.85	0.85
Uniform Delay (d), s/veh	57.1	46.0	0.0	45.3	28.1	27.8	55.6	30.2	13.6	53.8	32.8	32.8
Incr Delay (d2), s/veh	7.1	1.1	0.0	19.4	0.2	0.4	5.5	0.1	0.1	19.4	3.3	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.2	0.0	13.6	5.1	4.2	3.3	6.4	6.2	4.9	14.1	15.5
LnGrp Delay(d),s/veh	64.2	47.1	0.0	64.7	28.3	28.3	61.1	30.3	13.7	73.2	36.1	38.9
LnGrp LOS	E	D		E	C	C	E	C	B	E	D	D
Approach Vol, veh/h		386			1308			1286			1693	
Approach Delay, s/veh		49.5			48.1			30.3			42.4	
Approach LOS		D			D			C			D	

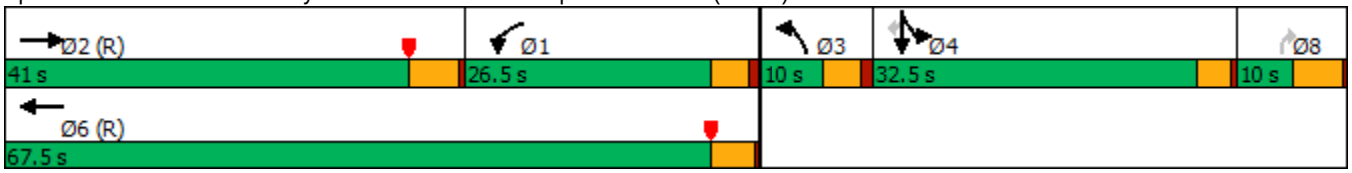
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	47.3	31.8	25.9	12.0	50.3	8.8	48.9
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	24.0	28.0	37.0	8.0	27.0	15.0	50.0
Max Q Clear Time (g_c+I1), s	11.4	15.4	27.7	12.1	9.1	30.4	5.7	12.2
Green Ext Time (p_c), s	0.0	5.8	0.1	7.8	0.0	0.0	0.0	8.8

Intersection Summary	
HCM 2010 Ctrl Delay	41.3
HCM 2010 LOS	D

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	1038	454	676	71	241	276	24	64
Future Volume (vph)	1038	454	676	71	241	276	24	64
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	41.0	26.5	67.5	10.0	10.0	32.5	32.5	32.5
Total Split (%)	34.2%	22.1%	56.3%	8.3%	8.3%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lead	Lag		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	45.6	22.0	72.6	5.5	6.5	18.0	18.0	18.0
Actuated g/C Ratio	0.38	0.18	0.60	0.05	0.05	0.15	0.15	0.15
v/c Ratio	0.85	1.59	0.34	1.00	0.78	0.61	0.09	0.19
Control Delay	42.1	306.0	8.3	159.5	23.5	52.3	41.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	306.0	8.3	159.5	23.5	52.3	41.5	1.2
LOS	D	F	A	F	C	D	D	A
Approach Delay	42.1		127.9				42.6	
Approach LOS	D		F				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 34 (28%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.59	
Intersection Signal Delay: 77.4	Intersection LOS: E
Intersection Capacity Utilization 79.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1038	19	454	676	0	71	0	241	276	24	64
Future Volume (veh/h)	0	1038	19	454	676	0	71	0	241	276	24	64
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0	1800	0	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	1141	21	499	743	0	78	0	265	303	26	70
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1088	20	816	2952	0	0	0	0	384	220	187
Arrive On Green	0.00	0.30	0.30	0.95	1.00	0.00	0.00	0.00	0.00	0.12	0.12	0.12
Sat Flow, veh/h	0	3721	67	1714	3705	0		0		3326	1900	1615
Grp Volume(v), veh/h	0	568	594	499	743	0		0.0		303	26	70
Grp Sat Flow(s),veh/h/ln	0	1805	1888	1714	1805	0				1663	1900	1615
Q Serve(g_s), s	0.0	36.0	36.0	4.0	0.0	0.0				10.6	1.5	4.8
Cycle Q Clear(g_c), s	0.0	36.0	36.0	4.0	0.0	0.0				10.6	1.5	4.8
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	542	566	816	2952	0				384	220	187
V/C Ratio(X)	0.00	1.05	1.05	0.61	0.25	0.00				0.79	0.12	0.38
Avail Cap(c_a), veh/h	0	542	566	816	2952	0				804	459	390
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	42.0	42.0	1.6	0.0	0.0				51.6	47.6	49.1
Incr Delay (d2), s/veh	0.0	52.0	51.3	1.3	0.2	0.0				3.6	0.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	25.7	26.8	1.7	0.1	0.0				5.1	0.8	2.2
LnGrp Delay(d),s/veh	0.0	94.0	93.3	2.9	0.2	0.0				55.3	47.8	50.3
LnGrp LOS		F	F	A	A					E	D	D
Approach Vol, veh/h		1162			1242						399	
Approach Delay, s/veh		93.6			1.3						53.9	
Approach LOS		F			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	61.6	41.0		17.4		102.6		
Change Period (Y+Rc), s	4.5	5.0		3.5		4.5		
Max Green Setting (Gmax), s	22.0	36.0		29.0		63.0		
Max Q Clear Time (g_c+I1), s	6.0	38.0		12.6		2.0		
Green Ext Time (p_c), s	1.4	0.0		1.2		4.2		

Intersection Summary	
HCM 2010 Ctrl Delay	47.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	313	506	12	591	56	52	25	132	16
Future Volume (vph)	313	506	12	591	56	52	25	132	16
Turn Type	Prot	NA	Prot	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	24.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	38.8	9.6	25.4	25.4	31.6	31.6	31.6	31.6
Total Split (%)	28.8%	48.5%	12.0%	31.8%	31.8%	39.5%	39.5%	39.5%	39.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	16.4	36.1	5.2	16.6	16.6		19.7		19.7
Actuated g/C Ratio	0.24	0.53	0.08	0.24	0.24		0.29		0.29
v/c Ratio	0.81	0.31	0.10	0.71	0.12		0.27		0.75
Control Delay	44.0	11.2	36.6	30.1	0.5		21.8		35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	44.0	11.2	36.6	30.1	0.5		21.8		35.3
LOS	D	B	D	C	A		C		D
Approach Delay		23.1		27.7			21.8		35.3
Approach LOS		C		C			C		D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 68.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 26.5	Intersection LOS: C
Intersection Capacity Utilization 68.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	506	41	12	591	56	52	25	23	132	16	154
Future Volume (veh/h)	313	506	41	12	591	56	52	25	23	132	16	154
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	329	533	43	13	622	59	55	26	24	139	17	162
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	1577	127	28	942	412	258	121	85	246	42	207
Arrive On Green	0.22	0.47	0.47	0.02	0.26	0.26	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1714	3378	272	1714	3610	1577	647	477	333	621	164	815
Grp Volume(v), veh/h	329	284	292	13	622	59	105	0	0	318	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1845	1714	1805	1577	1457	0	0	1600	0	0
Q Serve(g_s), s	10.8	5.8	5.9	0.4	9.0	1.7	0.0	0.0	0.0	7.7	0.0	0.0
Cycle Q Clear(g_c), s	10.8	5.8	5.9	0.4	9.0	1.7	3.0	0.0	0.0	10.7	0.0	0.0
Prop In Lane	1.00		0.15	1.00		1.00	0.52		0.23	0.44		0.51
Lane Grp Cap(c), veh/h	381	843	861	28	942	412	464	0	0	495	0	0
V/C Ratio(X)	0.86	0.34	0.34	0.47	0.66	0.14	0.23	0.00	0.00	0.64	0.00	0.00
Avail Cap(c_a), veh/h	538	1003	1025	146	1181	516	768	0	0	814	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.0	9.9	9.9	28.6	19.4	16.6	17.3	0.0	0.0	20.1	0.0	0.0
Incr Delay (d2), s/veh	7.7	0.2	0.2	4.4	1.0	0.2	0.2	0.0	0.0	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	2.9	3.0	0.2	4.6	0.8	1.4	0.0	0.0	5.0	0.0	0.0
LnGrp Delay(d),s/veh	29.6	10.1	10.1	33.0	20.3	16.8	17.6	0.0	0.0	21.5	0.0	0.0
LnGrp LOS	C	B	B	C	C	B	B			C		
Approach Vol, veh/h		905			694			105			318	
Approach Delay, s/veh		17.2			20.2			17.6			21.5	
Approach LOS		B			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	33.6		19.5	17.6	21.5		19.5
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	32.6		27.0	18.4	19.2		27.0
Max Q Clear Time (g_c+I1), s	2.4	7.9		12.7	12.8	11.0		5.0
Green Ext Time (p_c), s	0.0	7.6		2.1	0.2	4.2		2.5

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	313	731	12	813	279	52	25	207	16
Future Volume (vph)	313	731	12	813	279	52	25	207	16
Turn Type	Prot	NA	Prot	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	24.2	31.6	31.6	31.6	31.6
Total Split (s)	33.3	78.6	9.6	54.9	54.9	31.8	31.8	31.8	31.8
Total Split (%)	27.8%	65.5%	8.0%	45.8%	45.8%	26.5%	26.5%	26.5%	26.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2		4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	22.4	56.7	5.3	31.0	31.0		21.8	21.8	21.8
Actuated g/C Ratio	0.25	0.62	0.06	0.34	0.34		0.24	0.24	0.24
v/c Ratio	0.79	0.37	0.13	0.70	0.40		0.32	0.73	0.46
Control Delay	48.8	9.7	53.3	30.5	4.7		35.4	50.9	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	48.8	9.7	53.3	30.5	4.7		35.4	50.9	36.9
LOS	D	A	D	C	A		D	D	D
Approach Delay		20.9		24.2			35.4		44.6
Approach LOS		C		C			D		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 91.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 26.2	Intersection LOS: C
Intersection Capacity Utilization 78.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	731	41	12	813	279	52	25	23	207	16	154
Future Volume (veh/h)	313	731	41	12	813	279	52	25	23	207	16	154
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	329	769	43	13	856	294	55	26	24	218	17	162
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	367	2003	112	27	1366	598	167	78	54	353	35	337
Arrive On Green	0.21	0.58	0.58	0.02	0.38	0.38	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1714	3471	194	1714	3610	1579	451	345	236	1375	156	1483
Grp Volume(v), veh/h	329	400	412	13	856	294	105	0	0	218	0	179
Grp Sat Flow(s),veh/h/ln	1714	1805	1861	1714	1805	1579	1032	0	0	1375	0	1638
Q Serve(g_s), s	16.0	10.3	10.3	0.6	16.5	12.2	3.3	0.0	0.0	4.4	0.0	8.1
Cycle Q Clear(g_c), s	16.0	10.3	10.3	0.6	16.5	12.2	11.4	0.0	0.0	15.7	0.0	8.1
Prop In Lane	1.00		0.10	1.00		1.00	0.52		0.23	1.00		0.91
Lane Grp Cap(c), veh/h	367	1041	1073	27	1366	598	299	0	0	353	0	373
V/C Ratio(X)	0.90	0.38	0.38	0.49	0.63	0.49	0.35	0.00	0.00	0.62	0.00	0.48
Avail Cap(c_a), veh/h	575	1528	1575	100	2056	899	433	0	0	477	0	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.7	9.8	9.8	41.8	21.7	20.3	30.3	0.0	0.0	32.0	0.0	28.6
Incr Delay (d2), s/veh	7.8	0.2	0.2	5.1	0.5	0.6	0.7	0.0	0.0	1.8	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	5.2	5.3	0.3	8.3	5.4	2.3	0.0	0.0	5.1	0.0	3.8
LnGrp Delay(d),s/veh	40.4	10.1	10.1	46.8	22.1	20.9	31.0	0.0	0.0	33.8	0.0	29.6
LnGrp LOS	D	B	B	D	C	C	C			C		C
Approach Vol, veh/h		1141			1163			105			397	
Approach Delay, s/veh		18.8			22.1			31.0			31.9	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	55.5		24.1	22.9	38.6		24.1
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	72.4		27.2	28.7	48.7		27.2
Max Q Clear Time (g_c+I1), s	2.6	12.3		17.7	18.0	18.5		13.4
Green Ext Time (p_c), s	0.0	17.0		1.6	0.3	13.8		2.0

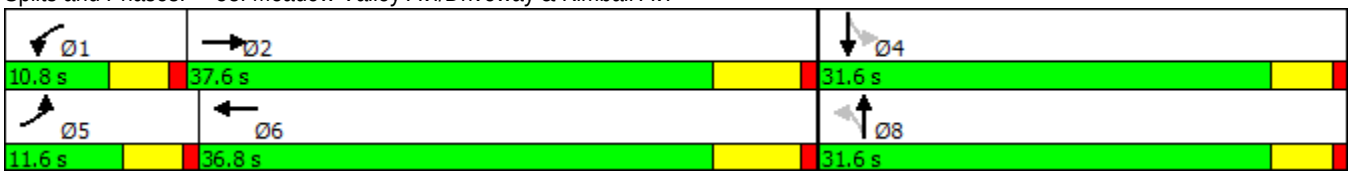
Intersection Summary	
HCM 2010 Ctrl Delay	22.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	109	533	33	569	74	0	2	0
Future Volume (vph)	109	533	33	569	74	0	2	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	31.6	31.6	31.6	31.6
Total Split (s)	11.6	37.6	10.8	36.8	31.6	31.6	31.6	31.6
Total Split (%)	14.5%	47.0%	13.5%	46.0%	39.5%	39.5%	39.5%	39.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.1	22.7	5.7	14.6		12.8		12.8
Actuated g/C Ratio	0.14	0.45	0.11	0.29		0.25		0.25
v/c Ratio	0.49	0.38	0.19	0.61		0.26		0.04
Control Delay	33.4	12.4	26.9	18.6		6.0		0.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	33.4	12.4	26.9	18.6		6.0		0.2
LOS	C	B	C	B		A		A
Approach Delay		15.8		19.0		6.0		0.2
Approach LOS		B		B		A		A

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 50.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 16.3 — Intersection LOS: B
Intersection Capacity Utilization 47.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 53: Meadow Valley Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	533	19	33	569	8	74	0	28	2	0	16
Future Volume (veh/h)	109	533	19	33	569	8	74	0	28	2	0	16
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	118	586	21	36	625	9	81	0	31	2	0	17
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	149	1370	49	69	1236	18	371	23	97	101	28	329
Arrive On Green	0.09	0.39	0.39	0.04	0.34	0.34	0.23	0.00	0.23	0.23	0.00	0.23
Sat Flow, veh/h	1714	3552	127	1714	3643	52	1020	100	429	47	124	1458
Grp Volume(v), veh/h	118	298	309	36	310	324	112	0	0	19	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1874	1714	1805	1891	1549	0	0	1629	0	0
Q Serve(g_s), s	3.0	5.4	5.4	0.9	6.1	6.1	1.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.0	5.4	5.4	0.9	6.1	6.1	2.6	0.0	0.0	0.4	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.03	0.72		0.28	0.11		0.89
Lane Grp Cap(c), veh/h	149	696	723	69	612	642	490	0	0	458	0	0
V/C Ratio(X)	0.79	0.43	0.43	0.52	0.51	0.51	0.23	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	271	1281	1330	240	1248	1307	1077	0	0	1073	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.8	10.0	10.0	20.8	11.7	11.7	14.2	0.0	0.0	13.4	0.0	0.0
Incr Delay (d2), s/veh	3.6	0.4	0.4	2.2	0.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.7	2.8	0.5	3.1	3.3	1.2	0.0	0.0	0.2	0.0	0.0
LnGrp Delay(d),s/veh	23.4	10.4	10.4	23.0	12.3	12.3	14.4	0.0	0.0	13.4	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	B			B		
Approach Vol, veh/h		725			670			112			19	
Approach Delay, s/veh		12.5			12.9			14.4			13.4	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.4	23.3		14.6	8.4	21.2		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	6.2	31.4		27.0	7.0	30.6		27.0
Max Q Clear Time (g_c+I1), s	2.9	7.4		2.4	5.0	8.1		4.6
Green Ext Time (p_c), s	0.0	7.1		0.7	0.0	6.9		0.7

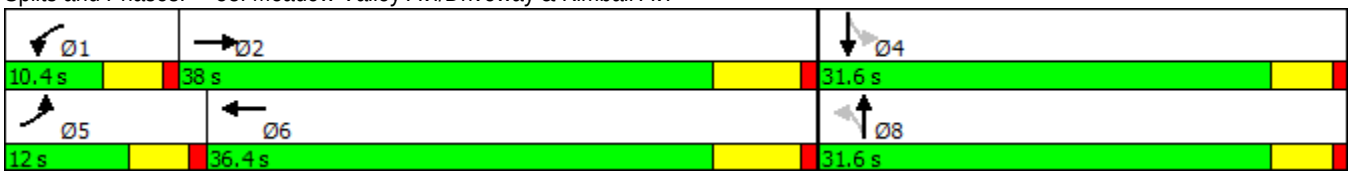
Intersection Summary	
HCM 2010 Ctrl Delay	12.8
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	109	833	33	1014	74	0	2	0
Future Volume (vph)	109	833	33	1014	74	0	2	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	31.6	31.6	31.6	31.6
Total Split (s)	12.0	38.0	10.4	36.4	31.6	31.6	31.6	31.6
Total Split (%)	15.0%	47.5%	13.0%	45.5%	39.5%	39.5%	39.5%	39.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	33.5	5.6	25.2		12.9		12.9
Actuated g/C Ratio	0.12	0.55	0.09	0.41		0.21		0.21
v/c Ratio	0.58	0.47	0.23	0.75		0.29		0.04
Control Delay	43.0	11.6	33.8	20.1		7.6		0.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	43.0	11.6	33.8	20.1		7.6		0.2
LOS	D	B	C	C		A		A
Approach Delay		15.1		20.5		7.6		0.2
Approach LOS		B		C		A		A

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 61.1
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 17.3 — Intersection LOS: B
Intersection Capacity Utilization 60.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 53: Meadow Valley Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	833	19	33	1014	8	74	0	28	2	0	16
Future Volume (veh/h)	109	833	19	33	1014	8	74	0	28	2	0	16
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	118	915	21	36	1114	9	81	0	31	2	0	17
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	149	1812	42	66	1666	13	297	18	78	81	22	263
Arrive On Green	0.09	0.50	0.50	0.04	0.45	0.45	0.18	0.00	0.18	0.18	0.00	0.18
Sat Flow, veh/h	1714	3605	83	1714	3670	30	1020	100	429	49	122	1457
Grp Volume(v), veh/h	118	458	478	36	548	575	112	0	0	19	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1883	1714	1805	1895	1549	0	0	1629	0	0
Q Serve(g_s), s	3.7	9.4	9.4	1.1	13.2	13.2	2.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.7	9.4	9.4	1.1	13.2	13.2	3.4	0.0	0.0	0.5	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	0.72		0.28	0.11		0.89
Lane Grp Cap(c), veh/h	149	907	946	66	819	860	392	0	0	366	0	0
V/C Ratio(X)	0.79	0.51	0.51	0.55	0.67	0.67	0.29	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	229	1038	1082	180	985	1034	862	0	0	858	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.8	9.2	9.2	26.1	11.8	11.8	19.9	0.0	0.0	18.8	0.0	0.0
Incr Delay (d2), s/veh	4.7	0.4	0.4	2.6	1.3	1.3	0.4	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.7	4.9	0.6	6.8	7.2	1.5	0.0	0.0	0.2	0.0	0.0
LnGrp Delay(d),s/veh	29.4	9.6	9.6	28.7	13.2	13.1	20.3	0.0	0.0	18.8	0.0	0.0
LnGrp LOS	C	A	A	C	B	B	C			B		
Approach Vol, veh/h		1054			1159			112			19	
Approach Delay, s/veh		11.8			13.6			20.3			18.8	
Approach LOS		B			B			C			B	

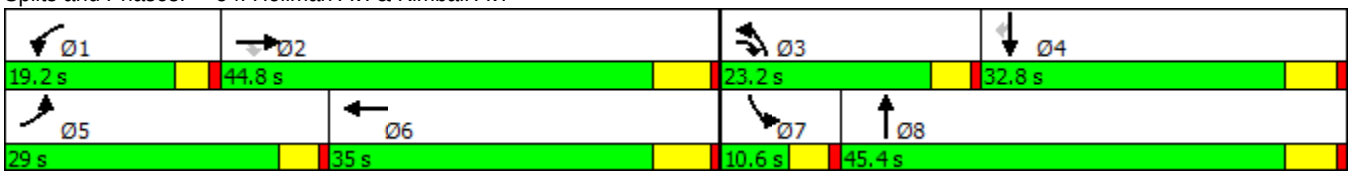
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	34.0		14.6	9.4	31.3		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.8	31.8		27.0	7.4	30.2		27.0
Max Q Clear Time (g_c+I1), s	3.1	11.4		2.5	5.7	15.2		5.4
Green Ext Time (p_c), s	0.0	12.2		0.7	0.0	9.9		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	256	175	132	99	261	163	521	21	135	186
Future Volume (vph)	256	175	132	99	261	163	521	21	135	186
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	3	1	6	3	8	7	4	
Permitted Phases			2							4
Detector Phase	5	2	3	1	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	9.5	33.2	9.6	32.8	9.6	32.8	32.8
Total Split (s)	29.0	44.8	23.2	19.2	35.0	23.2	45.4	10.6	32.8	32.8
Total Split (%)	24.2%	37.3%	19.3%	16.0%	29.2%	19.3%	37.8%	8.8%	27.3%	27.3%
Yellow Time (s)	3.6	5.2	3.6	3.0	5.2	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	4.0	6.2	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	19.3	34.1	54.5	10.4	21.7	13.8	29.9	5.8	14.6	14.6
Actuated g/C Ratio	0.21	0.37	0.59	0.11	0.24	0.15	0.33	0.06	0.16	0.16
v/c Ratio	0.77	0.27	0.14	0.55	0.75	0.68	0.62	0.21	0.25	0.47
Control Delay	52.1	25.2	2.6	54.6	45.9	54.7	29.7	54.8	37.6	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	25.2	2.6	54.6	45.9	54.7	29.7	54.8	37.6	9.5
LOS	D	C	A	D	D	D	C	D	D	A
Approach Delay		32.1			48.0		34.6		23.4	
Approach LOS		C			D		C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 91.9	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 34.7	Intersection LOS: C
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	175	132	99	261	50	163	521	148	21	135	186
Future Volume (veh/h)	256	175	132	99	261	50	163	521	148	21	135	186
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	275	188	142	106	281	54	175	560	159	23	145	200
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	315	649	751	134	354	68	212	834	236	43	727	325
Arrive On Green	0.18	0.34	0.34	0.08	0.23	0.23	0.12	0.30	0.30	0.02	0.20	0.20
Sat Flow, veh/h	1714	1900	1615	1714	1550	298	1714	2780	787	1714	3610	1615
Grp Volume(v), veh/h	275	188	142	106	0	335	175	363	356	23	145	200
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	0	1847	1714	1805	1761	1714	1805	1615
Q Serve(g_s), s	12.6	5.8	4.2	4.9	0.0	13.8	8.0	14.2	14.3	1.1	2.7	9.1
Cycle Q Clear(g_c), s	12.6	5.8	4.2	4.9	0.0	13.8	8.0	14.2	14.3	1.1	2.7	9.1
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	315	649	751	134	0	422	212	541	528	43	727	325
V/C Ratio(X)	0.87	0.29	0.19	0.79	0.00	0.79	0.83	0.67	0.67	0.54	0.20	0.62
Avail Cap(c_a), veh/h	519	909	972	323	0	660	395	886	865	128	1208	541
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	19.4	12.7	36.5	0.0	29.3	34.5	24.7	24.8	38.9	26.8	29.4
Incr Delay (d2), s/veh	4.9	0.2	0.1	3.9	0.0	3.6	3.1	1.4	1.5	3.9	0.1	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	3.1	1.9	2.5	0.0	7.4	4.0	7.3	7.1	0.6	1.4	4.2
LnGrp Delay(d),s/veh	37.0	19.7	12.8	40.4	0.0	32.9	37.6	26.2	26.3	42.7	26.9	31.3
LnGrp LOS	D	B	B	D		C	D	C	C	D	C	C
Approach Vol, veh/h		605			441			894			368	
Approach Delay, s/veh		25.9			34.7			28.5			30.3	
Approach LOS		C			C			C			C	

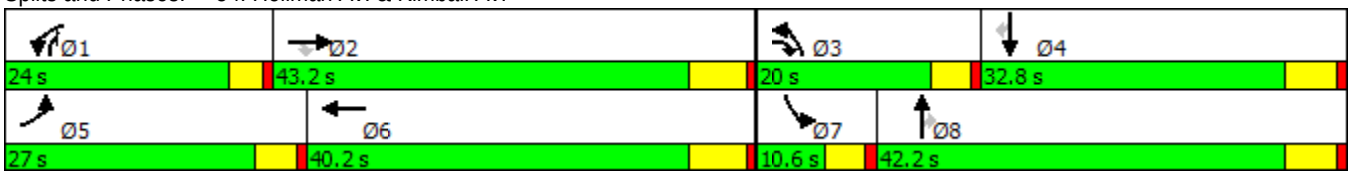
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	33.7	14.6	22.0	19.4	24.6	6.6	30.0
Change Period (Y+Rc), s	4.0	6.2	4.6	5.8	4.6	6.2	4.6	5.8
Max Green Setting (Gmax), s	15.2	38.6	18.6	27.0	24.4	28.8	6.0	39.6
Max Q Clear Time (g_c+I1), s	6.9	7.8	10.0	11.1	14.6	15.8	3.1	16.3
Green Ext Time (p_c), s	0.1	3.3	0.1	5.1	0.3	2.7	0.0	5.9

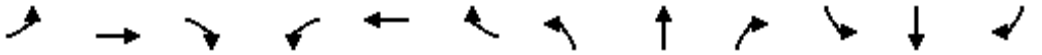
Intersection Summary	
HCM 2010 Ctrl Delay	29.3
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	256	475	132	331	706	163	521	298	21	135	186
Future Volume (vph)	256	475	132	331	706	163	521	298	21	135	186
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2	3	1	6	3	8	1	7	4	
Permitted Phases			2					8			4
Detector Phase	5	2	3	1	6	3	8	1	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	9.5	33.2	9.6	32.8	9.5	9.6	32.8	32.8
Total Split (s)	27.0	43.2	20.0	24.0	40.2	20.0	42.2	24.0	10.6	32.8	32.8
Total Split (%)	22.5%	36.0%	16.7%	20.0%	33.5%	16.7%	35.2%	20.0%	8.8%	27.3%	27.3%
Yellow Time (s)	3.6	5.2	3.6	3.0	5.2	3.6	4.8	3.0	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	4.0	6.2	4.6	5.8	4.0	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min	Min
Act Effct Green (s)	19.8	33.2	53.3	14.9	27.7	13.7	28.8	49.6	5.6	14.0	14.0
Actuated g/C Ratio	0.20	0.34	0.55	0.15	0.29	0.14	0.30	0.51	0.06	0.14	0.14
v/c Ratio	0.79	0.41	0.15	0.70	0.79	0.73	0.52	0.35	0.23	0.28	0.50
Control Delay	56.0	27.0	2.9	48.6	39.3	61.2	32.5	7.4	56.0	40.1	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	27.0	2.9	48.6	39.3	61.2	32.5	7.4	56.0	40.1	10.1
LOS	E	C	A	D	D	E	C	A	E	D	B
Approach Delay		31.9			42.2		29.6			24.8	
Approach LOS		C			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 97	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 33.9	Intersection LOS: C
Intersection Capacity Utilization 72.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	475	132	331	706	50	163	521	298	21	135	186
Future Volume (veh/h)	256	475	132	331	706	50	163	521	298	21	135	186
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	275	511	142	356	759	54	175	560	320	23	145	200
Adj No. of Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	308	1248	753	431	990	70	207	1035	672	41	686	307
Arrive On Green	0.18	0.35	0.35	0.13	0.29	0.29	0.12	0.29	0.29	0.02	0.19	0.19
Sat Flow, veh/h	1714	3610	1615	3326	3419	243	1714	3610	1615	1714	3610	1615
Grp Volume(v), veh/h	275	511	142	356	401	412	175	560	320	23	145	200
Grp Sat Flow(s),veh/h/ln	1714	1805	1615	1663	1805	1857	1714	1805	1615	1714	1805	1615
Q Serve(g_s), s	15.1	10.4	4.9	10.0	19.5	19.5	9.6	12.6	13.9	1.3	3.3	11.0
Cycle Q Clear(g_c), s	15.1	10.4	4.9	10.0	19.5	19.5	9.6	12.6	13.9	1.3	3.3	11.0
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	308	1248	753	431	523	538	207	1035	672	41	686	307
V/C Ratio(X)	0.89	0.41	0.19	0.83	0.77	0.77	0.85	0.54	0.48	0.56	0.21	0.65
Avail Cap(c_a), veh/h	400	1390	816	692	638	657	275	1367	821	107	1014	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	24.0	15.0	40.8	31.2	31.2	41.4	29.0	20.4	46.4	32.9	36.0
Incr Delay (d2), s/veh	15.8	0.2	0.1	2.1	4.5	4.4	13.5	0.4	0.5	4.4	0.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	5.2	2.2	4.7	10.3	10.6	5.3	6.4	6.2	0.7	1.6	5.1
LnGrp Delay(d),s/veh	54.4	24.2	15.1	42.8	35.7	35.6	54.9	29.4	21.0	50.8	33.0	38.3
LnGrp LOS	D	C	B	D	D	D	D	C	C	D	C	D
Approach Vol, veh/h		928			1169			1055			368	
Approach Delay, s/veh		31.7			37.8			31.1			37.0	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.5	39.4	16.2	24.1	21.8	34.0	6.9	33.3
Change Period (Y+Rc), s	4.0	6.2	4.6	5.8	4.6	6.2	4.6	5.8
Max Green Setting (Gmax), s	20.0	37.0	15.4	27.0	22.4	34.0	6.0	36.4
Max Q Clear Time (g_c+I1), s	12.0	12.4	11.6	13.0	17.1	21.5	3.3	15.9
Green Ext Time (p_c), s	0.4	8.9	0.1	5.3	0.2	6.3	0.0	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	34.1
HCM 2010 LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	514	1286	1376	812	648	1319	
Future Volume (vph)	514	1286	1376	812	648	1319	
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA	
Protected Phases	3	1	2	3	1	6	8
Permitted Phases		8		2			
Detector Phase	3	1	2	3	1	6	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0	36.3
Total Split (s)	39.0	34.0	47.0	39.0	34.0	81.0	39.0
Total Split (%)	32.5%	28.3%	39.2%	32.5%	28.3%	67.5%	33%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0	
Lead/Lag		Lead	Lag		Lead		
Lead-Lag Optimize?		Yes	Yes		Yes		
Recall Mode	None	None	Min	None	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 104.1
Natural Cycle: 105
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	514	0	1286	0	1376	812	648	1319	0
Future Volume (veh/h)	0	0	0	514	0	1286	0	1376	812	648	1319	0
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	0	1900	0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h				535	0	1275	0	1433	846	675	1374	0
Adj No. of Lanes				2	0	2	0	3	1	2	3	0
Peak Hour Factor				0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1020	0	1438	0	1865	1038	756	3205	0
Arrive On Green				0.29	0.00	0.29	0.00	0.36	0.36	0.22	0.62	0.00
Sat Flow, veh/h				3510	0	2842	0	5358	1581	3510	5358	0
Grp Volume(v), veh/h				535	0	1275	0	1433	846	675	1374	0
Grp Sat Flow(s),veh/h/ln				1755	0	1421	0	1729	1581	1755	1729	0
Q Serve(g_s), s				14.8	0.0	33.7	0.0	28.3	41.7	21.7	16.0	0.0
Cycle Q Clear(g_c), s				14.8	0.0	33.7	0.0	28.3	41.7	21.7	16.0	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h				1020	0	1438	0	1865	1038	756	3205	0
V/C Ratio(X)				0.52	0.00	0.89	0.00	0.77	0.82	0.89	0.43	0.00
Avail Cap(c_a), veh/h				1020	0	1438	0	1865	1038	878	3400	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				34.4	0.0	25.7	0.0	32.9	15.3	44.2	11.5	0.0
Incr Delay (d2), s/veh				0.2	0.0	6.8	0.0	2.1	5.2	10.5	0.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				7.2	0.0	19.5	0.0	13.9	21.6	11.6	7.6	0.0
LnGrp Delay(d),s/veh				34.7	0.0	32.5	0.0	34.9	20.5	54.7	11.5	0.0
LnGrp LOS				C		C		C	C	D	B	
Approach Vol, veh/h					1810			2279			2049	
Approach Delay, s/veh					33.2			29.6			25.7	
Approach LOS					C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	30.0	47.0				77.0		39.0
Change Period (Y+Rc), s	5.0	5.3				* 5.3		5.3
Max Green Setting (Gmax), s	29.0	41.7				* 76		33.7
Max Q Clear Time (g_c+I1), s	23.7	43.7				18.0		35.7
Green Ext Time (p_c), s	1.3	0.0				45.4		0.0

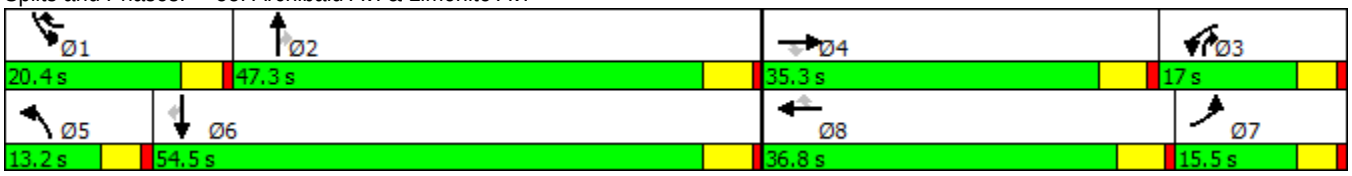
Intersection Summary	
HCM 2010 Ctrl Delay	29.3
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	608	92	329	647	824	120	1376	404	448	1319	223
Future Volume (vph)	230	608	92	329	647	824	120	1376	404	448	1319	223
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0	6.0
Minimum Split (s)	9.6	35.3	35.3	9.6	36.3	9.6	9.6	46.3	9.6	9.6	43.3	43.3
Total Split (s)	15.5	35.3	35.3	17.0	36.8	20.4	13.2	47.3	17.0	20.4	54.5	54.5
Total Split (%)	12.9%	29.4%	29.4%	14.2%	30.7%	17.0%	11.0%	39.4%	14.2%	17.0%	45.4%	45.4%
Yellow Time (s)	3.6	4.3	4.3	3.6	4.3	3.6	3.6	4.3	3.6	3.6	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.3	5.3	4.6	5.3	4.6	4.6	5.3	4.6	4.6	5.3	5.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 109
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	608	92	329	647	824	120	1376	404	448	1319	223
Future Volume (veh/h)	230	608	92	329	647	824	120	1376	404	448	1319	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1976	1976	1976	1976	1976	1976	1900	1976	1900	1976	1976	1900
Adj Flow Rate, veh/h	240	633	96	343	674	793	125	1433	421	467	1374	232
Adj No. of Lanes	2	2	1	2	2	2	2	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	322	749	335	404	833	1217	184	1990	767	528	2465	738
Arrive On Green	0.09	0.20	0.20	0.11	0.22	0.22	0.05	0.37	0.37	0.14	0.46	0.46
Sat Flow, veh/h	3651	3754	1680	3651	3754	3359	3510	5394	1595	3764	5394	1615
Grp Volume(v), veh/h	240	633	96	343	674	793	125	1433	421	467	1374	232
Grp Sat Flow(s),veh/h/ln	1825	1877	1680	1825	1877	1680	1755	1798	1595	1882	1798	1615
Q Serve(g_s), s	7.0	17.8	4.4	10.1	18.7	14.1	3.8	25.0	7.2	13.3	20.3	6.7
Cycle Q Clear(g_c), s	7.0	17.8	4.4	10.1	18.7	14.1	3.8	25.0	7.2	13.3	20.3	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	322	749	335	404	833	1217	184	1990	767	528	2465	738
V/C Ratio(X)	0.75	0.85	0.29	0.85	0.81	0.65	0.68	0.72	0.55	0.88	0.56	0.31
Avail Cap(c_a), veh/h	363	1027	460	413	1079	1437	275	2067	790	542	2465	738
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.8	42.3	25.2	47.8	40.4	13.7	51.0	29.7	7.0	46.2	21.7	8.5
Incr Delay (d2), s/veh	5.9	3.7	0.2	14.2	2.7	0.5	1.7	1.3	0.9	15.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	9.6	2.3	5.9	10.0	6.6	1.9	12.6	4.3	8.0	10.1	3.8
LnGrp Delay(d),s/veh	54.6	45.9	25.3	62.0	43.2	14.2	52.7	31.0	7.9	61.2	22.0	8.8
LnGrp LOS	D	D	C	E	D	B	D	C	A	E	C	A
Approach Vol, veh/h		969			1810			1979			2073	
Approach Delay, s/veh		46.1			34.0			27.5			29.4	
Approach LOS		D			C			C			C	

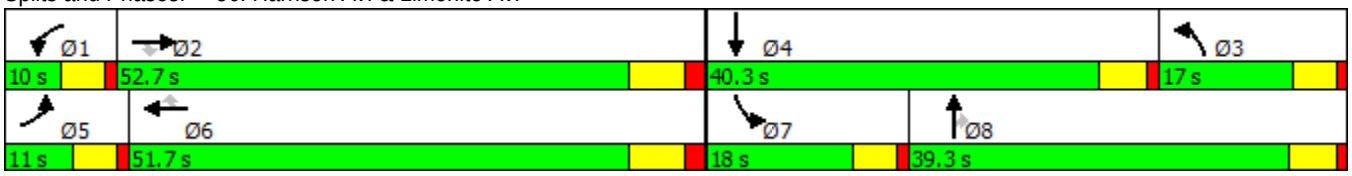
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	45.7	16.7	27.2	10.3	55.4	14.3	29.6
Change Period (Y+Rc), s	4.6	5.3	4.6	5.3	4.6	5.3	4.6	5.3
Max Green Setting (Gmax), s	15.8	42.0	12.4	30.0	8.6	49.2	10.9	31.5
Max Q Clear Time (g_c+I1), s	15.3	27.0	12.1	19.8	5.8	22.3	9.0	20.7
Green Ext Time (p_c), s	0.0	13.4	0.0	2.1	0.0	24.5	0.2	3.7

Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	71	1632	57	38	1545	82	119	57	144	164	30
Future Volume (vph)	71	1632	57	38	1545	82	119	57	144	164	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	11.0	52.7	52.7	10.0	51.7	51.7	17.0	39.3	39.3	18.0	40.3
Total Split (%)	9.2%	43.9%	43.9%	8.3%	43.1%	43.1%	14.2%	32.8%	32.8%	15.0%	33.6%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 94.3
Natural Cycle: 110
Control Type: Actuated-Uncoordinated

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	1632	57	38	1545	82	119	57	144	164	30	136
Future Volume (veh/h)	71	1632	57	38	1545	82	119	57	144	164	30	136
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	77	1774	60	41	1679	89	129	62	123	178	33	127
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	99	2561	798	64	2460	750	168	209	177	212	44	171
Arrive On Green	0.05	0.49	0.49	0.04	0.47	0.47	0.09	0.11	0.11	0.12	0.13	0.13
Sat Flow, veh/h	1810	5187	1615	1810	5187	1581	1810	1900	1611	1810	339	1304
Grp Volume(v), veh/h	77	1774	60	41	1679	89	129	62	123	178	0	160
Grp Sat Flow(s),veh/h/ln	1810	1729	1615	1810	1729	1581	1810	1900	1611	1810	0	1642
Q Serve(g_s), s	3.8	24.1	1.0	2.0	23.0	2.9	6.4	2.7	6.7	8.8	0.0	8.6
Cycle Q Clear(g_c), s	3.8	24.1	1.0	2.0	23.0	2.9	6.4	2.7	6.7	8.8	0.0	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	99	2561	798	64	2460	750	168	209	177	212	0	215
V/C Ratio(X)	0.78	0.69	0.08	0.64	0.68	0.12	0.77	0.30	0.70	0.84	0.00	0.74
Avail Cap(c_a), veh/h	119	2591	807	99	2534	773	237	706	599	257	0	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.7	17.8	3.7	43.6	18.7	13.4	40.5	37.5	39.2	39.5	0.0	38.3
Incr Delay (d2), s/veh	18.7	0.8	0.0	3.9	0.7	0.1	5.4	0.8	4.8	15.8	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	11.5	0.8	1.1	11.1	1.3	3.4	1.5	3.2	5.3	0.0	4.2
LnGrp Delay(d),s/veh	61.4	18.6	3.7	47.5	19.4	13.5	45.9	38.3	44.1	55.3	0.0	43.3
LnGrp LOS	E	B	A	D	B	B	D	D	D	E		D
Approach Vol, veh/h		1911			1809			314			338	
Approach Delay, s/veh		19.9			19.8			43.7			49.6	
Approach LOS		B			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	52.2	13.8	17.3	10.0	50.4	15.7	15.3
Change Period (Y+Rc), s	5.0	7.0	5.3	* 5.3	5.0	7.0	5.0	5.3
Max Green Setting (Gmax), s	5.0	45.7	12.0	* 35	6.0	44.7	13.0	34.0
Max Q Clear Time (g_c+I1), s	4.0	26.1	8.4	10.6	5.8	25.0	10.8	8.7
Green Ext Time (p_c), s	0.0	18.3	0.3	0.8	0.0	18.4	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	23.8
HCM 2010 LOS	C

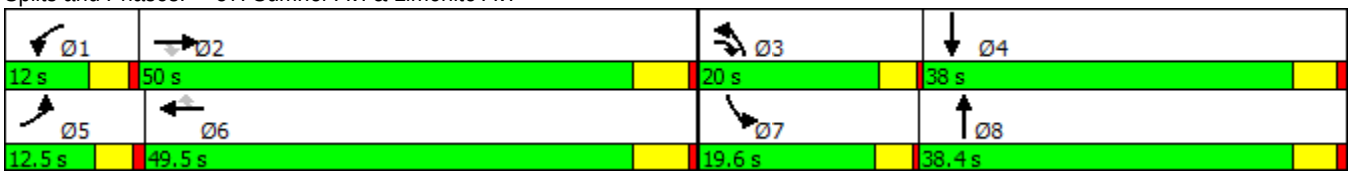
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	100	1634	295	165	1282	22	388	212	126	140
Future Volume (vph)	100	1634	295	165	1282	22	388	212	126	140
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	3	1	6		3	8	7	4
Permitted Phases			2			6				
Detector Phase	5	2	3	1	6	6	3	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	12.5	50.0	20.0	12.0	49.5	49.5	20.0	38.4	19.6	38.0
Total Split (%)	10.4%	41.7%	16.7%	10.0%	41.3%	41.3%	16.7%	32.0%	16.3%	31.7%
Yellow Time (s)	3.5	5.0	3.5	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.7
Natural Cycle: 110
Control Type: Actuated-Uncoordinated

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	1634	295	165	1282	22	388	212	276	126	140	96
Future Volume (veh/h)	100	1634	295	165	1282	22	388	212	276	126	140	96
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	108	1757	309	177	1378	18	417	228	223	135	151	76
Adj No. of Lanes	2	3	1	2	3	1	2	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	170	2313	945	246	2424	755	488	337	297	167	329	157
Arrive On Green	0.05	0.45	0.45	0.07	0.47	0.47	0.14	0.19	0.19	0.09	0.14	0.14
Sat Flow, veh/h	3510	5187	1615	3510	5187	1615	3510	1805	1589	1810	2360	1126
Grp Volume(v), veh/h	108	1757	309	177	1378	18	417	228	223	135	114	113
Grp Sat Flow(s),veh/h/ln	1755	1729	1615	1755	1729	1615	1755	1805	1589	1810	1805	1681
Q Serve(g_s), s	2.9	27.0	9.3	4.7	18.3	0.6	11.0	11.2	12.6	7.0	5.5	5.9
Cycle Q Clear(g_c), s	2.9	27.0	9.3	4.7	18.3	0.6	11.0	11.2	12.6	7.0	5.5	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	170	2313	945	246	2424	755	488	337	297	167	252	235
V/C Ratio(X)	0.63	0.76	0.33	0.72	0.57	0.02	0.85	0.68	0.75	0.81	0.45	0.48
Avail Cap(c_a), veh/h	296	2403	973	277	2424	755	591	635	559	297	627	584
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	22.0	10.1	43.3	18.3	13.6	39.9	36.0	36.5	42.3	37.5	37.7
Incr Delay (d2), s/veh	1.4	1.4	0.2	6.0	0.3	0.0	8.7	1.8	2.9	3.5	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	13.2	4.2	2.5	8.7	0.3	5.9	5.7	5.7	3.7	2.8	2.8
LnGrp Delay(d),s/veh	45.8	23.4	10.3	49.3	18.7	13.6	48.6	37.7	39.4	45.8	38.5	38.8
LnGrp LOS	D	C	B	D	B	B	D	D	D	D	D	D
Approach Vol, veh/h		2174			1573			868			362	
Approach Delay, s/veh		22.7			22.1			43.4			41.3	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	48.4	17.2	18.3	9.1	50.4	12.7	22.7
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	7.5	44.0	16.0	33.0	8.0	43.5	15.6	33.4
Max Q Clear Time (g_c+I1), s	6.7	29.0	13.0	7.9	4.9	20.3	9.0	14.6
Green Ext Time (p_c), s	0.0	13.4	0.2	3.1	0.0	20.9	0.0	2.9

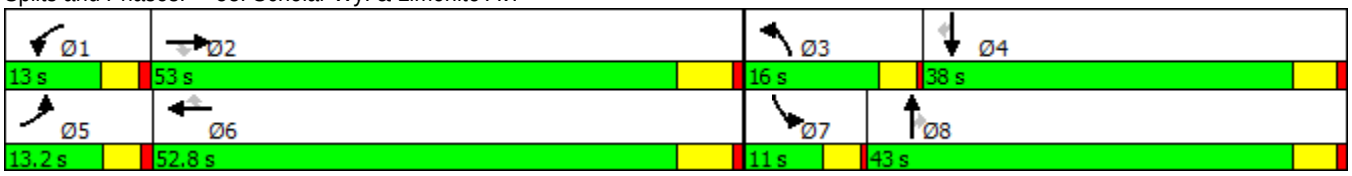
Intersection Summary	
HCM 2010 Ctrl Delay	27.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1727	88	90	1295	21	125	147	218	39	194	58
Future Volume (vph)	45	1727	88	90	1295	21	125	147	218	39	194	58
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	13.2	53.0	53.0	13.0	52.8	52.8	16.0	43.0	43.0	11.0	38.0	38.0
Total Split (%)	11.0%	44.2%	44.2%	10.8%	44.0%	44.0%	13.3%	35.8%	35.8%	9.2%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 96.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1727	88	90	1295	21	125	147	218	39	194	58
Future Volume (veh/h)	45	1727	88	90	1295	21	125	147	218	39	194	58
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	1877	87	98	1408	23	136	160	197	42	211	61
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	2586	805	125	2765	861	168	352	299	53	439	185
Arrive On Green	0.03	0.50	0.50	0.07	0.53	0.53	0.09	0.19	0.19	0.03	0.12	0.12
Sat Flow, veh/h	1810	5187	1615	1810	5187	1615	1810	1900	1612	1810	3610	1524
Grp Volume(v), veh/h	49	1877	87	98	1408	23	136	160	197	42	211	61
Grp Sat Flow(s),veh/h/ln	1810	1729	1615	1810	1729	1615	1810	1900	1612	1810	1805	1524
Q Serve(g_s), s	2.4	25.5	2.6	4.8	15.6	0.6	6.6	6.7	10.2	2.1	4.9	3.3
Cycle Q Clear(g_c), s	2.4	25.5	2.6	4.8	15.6	0.6	6.6	6.7	10.2	2.1	4.9	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	63	2586	805	125	2765	861	168	352	299	53	439	185
V/C Ratio(X)	0.78	0.73	0.11	0.78	0.51	0.03	0.81	0.45	0.66	0.79	0.48	0.33
Avail Cap(c_a), veh/h	176	2720	847	172	2765	861	242	805	684	141	1329	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.9	17.7	11.9	41.1	13.4	9.9	39.9	32.5	33.9	43.2	36.7	36.0
Incr Delay (d2), s/veh	7.6	0.9	0.1	10.0	0.2	0.0	7.9	0.7	1.8	9.2	0.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	12.2	1.1	2.7	7.5	0.3	3.7	3.6	4.7	1.2	2.5	1.4
LnGrp Delay(d),s/veh	50.5	18.6	12.0	51.0	13.6	9.9	47.8	33.2	35.7	52.4	37.3	36.8
LnGrp LOS	D	B	B	D	B	A	D	C	D	D	D	D
Approach Vol, veh/h		2013			1529			493			314	
Approach Delay, s/veh		19.1			15.9			38.2			39.2	
Approach LOS		B			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	50.7	12.3	15.9	7.6	53.8	6.6	21.6
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	8.5	47.0	12.0	33.0	8.7	46.8	7.0	38.0
Max Q Clear Time (g_c+I1), s	6.8	27.5	8.6	6.9	4.4	17.6	4.1	12.2
Green Ext Time (p_c), s	0.0	17.2	0.0	2.3	0.0	25.8	0.0	2.3

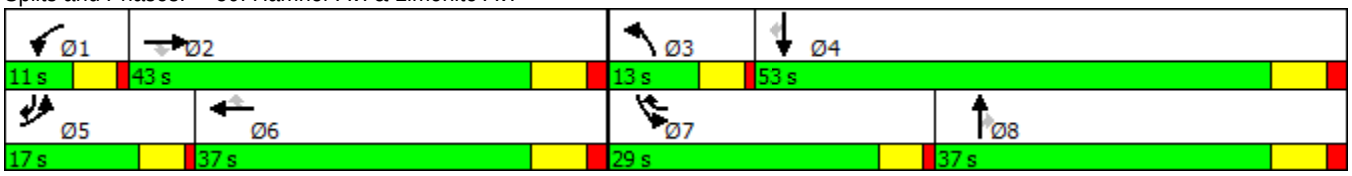
Intersection Summary	
HCM 2010 Ctrl Delay	21.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	317	1373	101	162	872	506	126	657	317	660	437	262
Future Volume (vph)	317	1373	101	162	872	506	126	657	317	660	437	262
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	7	3	8	8	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	5.0	5.0	6.0	6.0	5.0	6.0	5.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	10.0	10.0	37.0	37.0	10.0	37.0	10.0
Total Split (s)	17.0	43.0	43.0	11.0	37.0	29.0	13.0	37.0	37.0	29.0	53.0	17.0
Total Split (%)	14.2%	35.8%	35.8%	9.2%	30.8%	24.2%	10.8%	30.8%	30.8%	24.2%	44.2%	14.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0	5.0	7.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 116.8
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	1373	101	162	872	506	126	657	317	660	437	262
Future Volume (veh/h)	317	1373	101	162	872	506	126	657	317	660	437	262
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	327	1415	98	167	899	484	130	677	209	680	451	217
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	360	1596	496	180	1330	744	186	1197	365	720	1986	783
Arrive On Green	0.10	0.31	0.31	0.05	0.26	0.26	0.05	0.23	0.23	0.21	0.38	0.38
Sat Flow, veh/h	3510	5187	1612	3510	5187	1609	3510	5187	1584	3510	5187	1611
Grp Volume(v), veh/h	327	1415	98	167	899	484	130	677	209	680	451	217
Grp Sat Flow(s),veh/h/ln	1755	1729	1612	1755	1729	1609	1755	1729	1584	1755	1729	1611
Q Serve(g_s), s	10.8	30.4	5.2	5.5	18.2	27.1	4.3	13.5	13.7	22.3	6.9	9.4
Cycle Q Clear(g_c), s	10.8	30.4	5.2	5.5	18.2	27.1	4.3	13.5	13.7	22.3	6.9	9.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	360	1596	496	180	1330	744	186	1197	365	720	1986	783
V/C Ratio(X)	0.91	0.89	0.20	0.93	0.68	0.65	0.70	0.57	0.57	0.94	0.23	0.28
Avail Cap(c_a), veh/h	360	1596	496	180	1330	744	240	1330	406	720	2040	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	38.6	29.8	55.3	39.1	24.3	54.5	39.8	39.9	45.8	24.4	17.9
Incr Delay (d2), s/veh	25.4	6.8	0.4	46.0	1.8	2.8	3.4	0.9	3.1	20.8	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	15.6	2.4	3.8	9.0	12.5	2.2	6.6	6.3	12.9	3.3	4.3
LnGrp Delay(d),s/veh	77.4	45.4	30.3	101.3	40.9	27.0	57.9	40.7	43.0	66.6	24.5	18.3
LnGrp LOS	E	D	C	F	D	C	E	D	D	E	C	B
Approach Vol, veh/h		1840			1550			1016			1348	
Approach Delay, s/veh		50.3			43.1			43.4			44.7	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	43.0	11.2	51.8	17.0	37.0	29.0	34.0
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	6.0	36.0	8.0	46.0	12.0	30.0	24.0	30.0
Max Q Clear Time (g_c+I1), s	7.5	32.4	6.3	11.4	12.8	29.1	24.3	15.7
Green Ext Time (p_c), s	0.0	3.6	0.0	20.7	0.0	0.9	0.0	10.9

Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBT	WBR	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1960	786	1483	1057	424	0	237
Future Volume (vph)	1960	786	1483	1057	424	0	237
Turn Type	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	2		6		4	4	
Permitted Phases		2		6			4
Detector Phase	2	2	6	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	36.5	36.5	23.5	23.5	23.5
Total Split (s)	41.5	41.5	41.5	41.5	23.5	23.5	23.5
Total Split (%)	63.8%	63.8%	63.8%	63.8%	36.2%	36.2%	36.2%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 65
Offset: 2 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1960	786	0	1483	1057	0	0	0	424	0	237
Future Volume (veh/h)	0	1960	786	0	1483	1057	0	0	0	424	0	237
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900				1900	1900	1900
Adj Flow Rate, veh/h	0	2154	863	0	1630	1162				466	0	161
Adj No. of Lanes	0	3	1	0	3	1				2	0	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	3441	1049	0	3441	1047				606	0	541
Arrive On Green	0.00	0.66	0.66	0.00	1.00	1.00				0.17	0.00	0.17
Sat Flow, veh/h	0	5358	1582	0	5358	1578				3619	0	3230
Grp Volume(v), veh/h	0	2154	863	0	1630	1162				466	0	161
Grp Sat Flow(s),veh/h/ln	0	1729	1582	0	1729	1578				1810	0	1615
Q Serve(g_s), s	0.0	15.5	26.3	0.0	0.0	43.1				8.0	0.0	2.8
Cycle Q Clear(g_c), s	0.0	15.5	26.3	0.0	0.0	43.1				8.0	0.0	2.8
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3441	1049	0	3441	1047				606	0	541
V/C Ratio(X)	0.00	0.63	0.82	0.00	0.47	1.11				0.77	0.00	0.30
Avail Cap(c_a), veh/h	0	3441	1049	0	3441	1047				1002	0	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.38	0.38	0.00	0.56	0.56				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	6.3	8.1	0.0	0.0	0.0				25.9	0.0	23.7
Incr Delay (d2), s/veh	0.0	0.3	2.9	0.0	0.3	57.8				0.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	11.9	0.0	0.1	16.8				4.1	0.0	1.3
LnGrp Delay(d),s/veh	0.0	6.6	11.0	0.0	0.3	57.8				26.6	0.0	23.8
LnGrp LOS		A	B		A	F				C		C
Approach Vol, veh/h		3017			2792						627	
Approach Delay, s/veh		7.9			24.2						25.9	
Approach LOS		A			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		48.6		16.4		48.6		
Change Period (Y+Rc), s		5.5		5.5		5.5		
Max Green Setting (Gmax), s		36.0		18.0		36.0		
Max Q Clear Time (g_c+I1), s		28.3		10.0		45.1		
Green Ext Time (p_c), s		7.6		0.9		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	16.7
HCM 2010 LOS	B

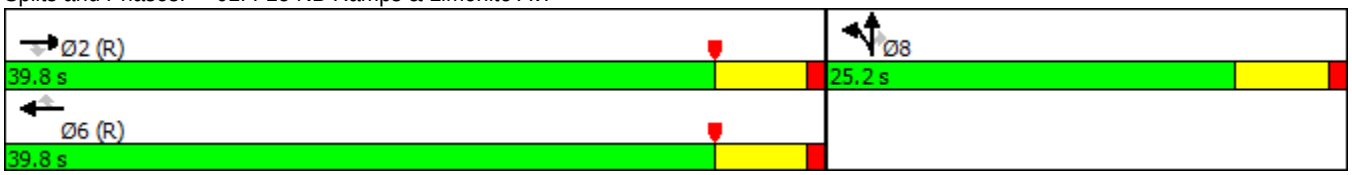
Notes

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	1997	387	1944	413	596	0	654
Future Volume (vph)	1997	387	1944	413	596	0	654
Turn Type	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	2		6		8	8	
Permitted Phases		2		6			8
Detector Phase	2	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	39.8	39.8	39.8	39.8	25.2	25.2	25.2
Total Split (%)	61.2%	61.2%	61.2%	61.2%	38.8%	38.8%	38.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1997	387	0	1944	413	596	0	654	0	0	0
Future Volume (veh/h)	0	1997	387	0	1944	413	596	0	654	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	0	2219	430	0	2160	399	662	0	486			
Adj No. of Lanes	0	3	1	0	3	1	2	0	2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	0	3057	932	0	3057	931	873	0	779			
Arrive On Green	0.00	1.00	1.00	0.00	0.59	0.59	0.24	0.00	0.24			
Sat Flow, veh/h	0	5358	1582	0	5358	1580	3619	0	3230			
Grp Volume(v), veh/h	0	2219	430	0	2160	399	662	0	486			
Grp Sat Flow(s),veh/h/ln	0	1729	1582	0	1729	1580	1810	0	1615			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	19.0	9.0	11.0	0.0	8.7			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	19.0	9.0	11.0	0.0	8.7			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	3057	932	0	3057	931	873	0	779			
V/C Ratio(X)	0.00	0.73	0.46	0.00	0.71	0.43	0.76	0.00	0.62			
Avail Cap(c_a), veh/h	0	3057	932	0	3057	931	1097	0	979			
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.70	0.70	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	9.4	7.3	22.9	0.0	22.0			
Incr Delay (d2), s/veh	0.0	1.1	1.1	0.0	1.4	1.4	2.4	0.0	0.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.3	0.0	9.4	4.3	5.8	0.0	3.9			
LnGrp Delay(d),s/veh	0.0	1.1	1.1	0.0	10.8	8.8	25.3	0.0	22.8			
LnGrp LOS		A	A		B	A	C		C			
Approach Vol, veh/h		2649			2559			1148				
Approach Delay, s/veh		1.1			10.5			24.3				
Approach LOS		A			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		43.8				43.8		21.2
Change Period (Y+Rc), s		5.5				5.5		5.5
Max Green Setting (Gmax), s		34.3				34.3		19.7
Max Q Clear Time (g_c+I1), s		2.0				21.0		13.0
Green Ext Time (p_c), s		29.8				12.8		2.6

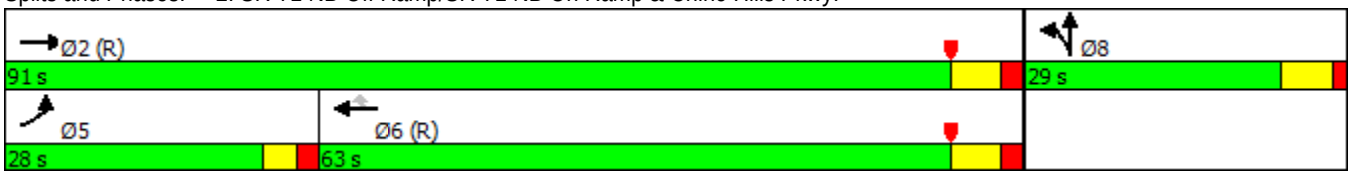
Intersection Summary	
HCM 2010 Ctrl Delay	9.1
HCM 2010 LOS	A

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	561	1486	793	729	548	175
Future Volume (vph)	561	1486	793	729	548	175
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	28.0	91.0	63.0	63.0	29.0	29.0
Total Split (%)	23.3%	75.8%	52.5%	52.5%	24.2%	24.2%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	23.0	84.5	56.5	56.5	23.0	23.0
Actuated g/C Ratio	0.19	0.70	0.47	0.47	0.19	0.19
v/c Ratio	1.00	0.63	0.50	0.94	1.01	0.93
Control Delay	85.1	13.4	23.3	44.7	102.5	68.4
Queue Delay	0.0	0.8	1.7	44.4	0.0	0.0
Total Delay	85.1	14.2	25.0	89.1	102.5	68.4
LOS	F	B	C	F	F	E
Approach Delay		33.6	55.7			79.8
Approach LOS		C	E			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 50.0	Intersection LOS: D
Intersection Capacity Utilization 94.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	561	1486	0	0	793	729	548	175	114	0	0	0
Future Volume (veh/h)	561	1486	0	0	793	729	548	175	114	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1900	0	0	1900	1900	1800	1900	1900			
Adj Flow Rate, veh/h	603	1598	0	0	853	781	589	188	119			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	602	2542	0	0	1700	750	657	209	132			
Arrive On Green	0.19	0.70	0.00	0.00	0.47	0.47	0.19	0.19	0.19			
Sat Flow, veh/h	3141	3705	0	0	3705	1593	3429	1089	689			
Grp Volume(v), veh/h	603	1598	0	0	853	781	589	0	307			
Grp Sat Flow(s),veh/h/ln	1570	1805	0	0	1805	1593	1714	0	1778			
Q Serve(g_s), s	23.0	28.2	0.0	0.0	19.6	56.5	20.1	0.0	20.2			
Cycle Q Clear(g_c), s	23.0	28.2	0.0	0.0	19.6	56.5	20.1	0.0	20.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.39			
Lane Grp Cap(c), veh/h	602	2542	0	0	1700	750	657	0	341			
V/C Ratio(X)	1.00	0.63	0.00	0.00	0.50	1.04	0.90	0.00	0.90			
Avail Cap(c_a), veh/h	602	2542	0	0	1700	750	657	0	341			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	0.41	0.41	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.5	9.4	0.0	0.0	22.0	31.8	47.3	0.0	47.4			
Incr Delay (d2), s/veh	30.4	0.8	0.0	0.0	0.4	32.8	17.3	0.0	29.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.5	14.0	0.0	0.0	9.8	31.6	11.1	0.0	12.7			
LnGrp Delay(d),s/veh	78.9	10.2	0.0	0.0	22.4	64.6	64.6	0.0	76.4			
LnGrp LOS	F	B			C	F	E		E			
Approach Vol, veh/h		2201			1634			896				
Approach Delay, s/veh		29.0			42.6			68.7				
Approach LOS		C			D			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		91.0			28.0	63.0		29.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		84.5			23.0	56.5		23.0
Max Q Clear Time (g_c+I1), s		30.2			25.0	58.5		22.2
Green Ext Time (p_c), s		40.8			0.0	0.0		0.4

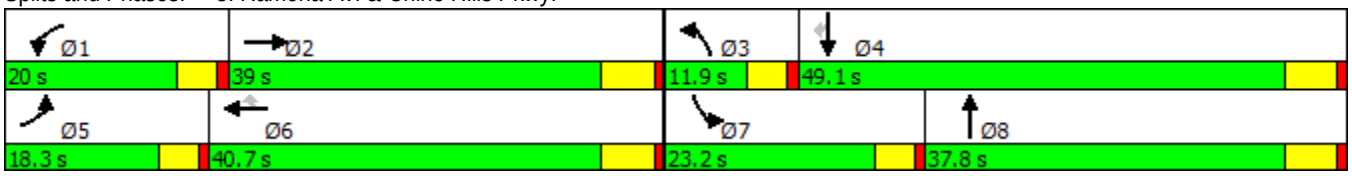
Intersection Summary	
HCM 2010 Ctrl Delay	41.2
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	329	1268	163	959	154	29	468	204	435	534
Future Volume (vph)	329	1268	163	959	154	29	468	204	435	534
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	18.3	39.0	20.0	40.7	40.7	11.9	37.8	23.2	49.1	49.1
Total Split (%)	15.3%	32.5%	16.7%	33.9%	33.9%	9.9%	31.5%	19.3%	40.9%	40.9%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	13.7	34.3	14.3	34.9	34.9	6.3	32.0	17.3	47.0	47.0
Actuated g/C Ratio	0.12	0.29	0.12	0.29	0.29	0.05	0.27	0.15	0.40	0.40
v/c Ratio	0.92	0.90	0.84	0.96	0.28	0.34	0.75	0.88	0.32	0.67
Control Delay	81.5	50.3	84.1	61.5	6.1	64.7	42.2	82.1	26.6	15.5
Queue Delay	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.5	57.5	84.1	61.5	6.1	64.7	42.2	82.1	26.6	15.5
LOS	F	E	F	E	A	E	D	F	C	B
Approach Delay		62.4		57.7			43.1		31.2	
Approach LOS		E		E			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.7	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 50.6	Intersection LOS: D
Intersection Capacity Utilization 92.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	1268	3	163	959	154	29	468	216	204	435	534
Future Volume (veh/h)	329	1268	3	163	959	154	29	468	216	204	435	534
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	350	1349	3	173	1020	119	31	498	175	217	463	458
Adj No. of Lanes	2	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	386	1576	4	199	1065	470	46	708	247	243	1392	614
Arrive On Green	0.12	0.29	0.29	0.12	0.30	0.30	0.03	0.27	0.27	0.14	0.39	0.39
Sat Flow, veh/h	3326	5344	12	1714	3610	1593	1714	2614	913	1714	3610	1591
Grp Volume(v), veh/h	350	873	479	173	1020	119	31	343	330	217	463	458
Grp Sat Flow(s),veh/h/ln	1663	1729	1898	1714	1805	1593	1714	1805	1722	1714	1805	1591
Q Serve(g_s), s	12.3	28.1	28.1	11.7	32.8	6.7	2.1	20.2	20.4	14.7	10.7	29.3
Cycle Q Clear(g_c), s	12.3	28.1	28.1	11.7	32.8	6.7	2.1	20.2	20.4	14.7	10.7	29.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	386	1020	560	199	1065	470	46	489	467	243	1392	614
V/C Ratio(X)	0.91	0.86	0.86	0.87	0.96	0.25	0.67	0.70	0.71	0.89	0.33	0.75
Avail Cap(c_a), veh/h	386	1020	560	224	1067	471	106	489	467	270	1392	614
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	39.2	39.2	51.3	40.9	31.7	56.9	38.7	38.8	49.8	25.6	31.3
Incr Delay (d2), s/veh	24.0	7.5	12.8	24.7	18.3	0.4	6.1	8.1	8.7	25.8	0.6	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	14.5	16.8	6.9	19.0	3.0	1.1	11.2	10.9	8.7	5.5	14.2
LnGrp Delay(d),s/veh	75.5	46.8	52.0	76.0	59.2	32.1	63.0	46.9	47.6	75.5	26.2	39.3
LnGrp LOS	E	D	D	E	E	C	E	D	D	E	C	D
Approach Vol, veh/h		1702			1312			704			1138	
Approach Delay, s/veh		54.2			59.0			47.9			40.9	
Approach LOS		D			E			D			D	

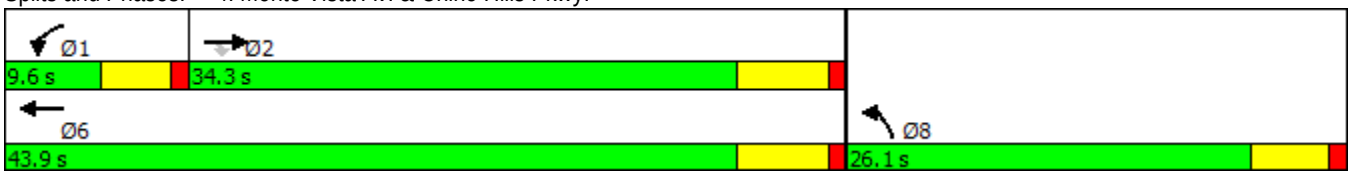
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.3	40.6	7.8	51.3	18.3	40.6	21.3	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	15.4	33.2	7.3	43.3	13.7	34.9	18.6	32.0
Max Q Clear Time (g_c+I1), s	13.7	30.1	4.1	31.3	14.3	34.8	16.7	22.4
Green Ext Time (p_c), s	0.0	3.0	0.0	6.5	0.0	0.1	0.1	5.6

Intersection Summary	
HCM 2010 Ctrl Delay	51.4
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	1192	160	59	1092	166
Future Volume (vph)	1192	160	59	1092	166
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	2		1	6	8
Permitted Phases		2			
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	24.8	24.8	9.6	15.8	26.1
Total Split (s)	34.3	34.3	9.6	43.9	26.1
Total Split (%)	49.0%	49.0%	13.7%	62.7%	37.3%
Yellow Time (s)	4.8	4.8	3.6	4.8	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	5.8	5.1
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	27.6	27.6	5.2	32.7	13.9
Actuated g/C Ratio	0.48	0.48	0.09	0.56	0.24
v/c Ratio	0.77	0.21	0.43	0.59	0.56
Control Delay	18.7	3.2	39.7	10.0	24.5
Queue Delay	0.0	0.0	0.0	0.2	0.0
Total Delay	18.7	3.2	39.7	10.1	24.5
LOS	B	A	D	B	C
Approach Delay	16.8			11.7	24.5
Approach LOS	B			B	C

Intersection Summary			
Cycle Length: 70			
Actuated Cycle Length: 57.9			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 62.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Monte Vista Av. & Chino Hills Pkwy.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1192	160	59	1092	166	45
Future Volume (veh/h)	1192	160	59	1092	166	45
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1324	178	66	1213	184	50
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1777	776	98	2274	234	63
Arrive On Green	0.49	0.49	0.06	0.63	0.18	0.18
Sat Flow, veh/h	3705	1575	1714	3705	1309	356
Grp Volume(v), veh/h	1324	178	66	1213	235	0
Grp Sat Flow(s),veh/h/ln	1805	1575	1714	1805	1672	0
Q Serve(g_s), s	16.7	3.7	2.1	10.7	7.6	0.0
Cycle Q Clear(g_c), s	16.7	3.7	2.1	10.7	7.6	0.0
Prop In Lane		1.00	1.00		0.78	0.21
Lane Grp Cap(c), veh/h	1777	776	98	2274	298	0
V/C Ratio(X)	0.75	0.23	0.68	0.53	0.79	0.00
Avail Cap(c_a), veh/h	1808	789	151	2417	617	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.6	8.3	26.3	5.9	22.3	0.0
Incr Delay (d2), s/veh	1.8	0.2	3.0	0.3	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	1.6	1.1	5.3	3.9	0.0
LnGrp Delay(d),s/veh	13.4	8.5	29.4	6.1	27.0	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	1502			1279	235	
Approach Delay, s/veh	12.8			7.3	27.0	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.8	33.8				41.7		15.3
Change Period (Y+Rc), s	4.6	5.8				5.8		5.1
Max Green Setting (Gmax), s	5.0	28.5				38.1		21.0
Max Q Clear Time (g_c+I1), s	4.1	18.7				12.7		9.6
Green Ext Time (p_c), s	0.0	9.3				22.9		0.5

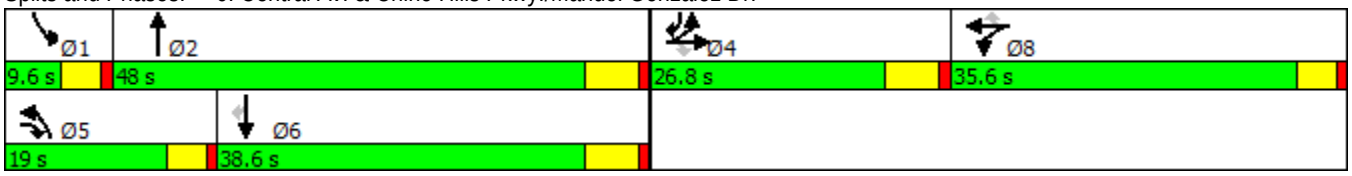
Intersection Summary	
HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	634	2	518	13	48	38	383	1262	12	1080	250
Future Volume (vph)	634	2	518	13	48	38	383	1262	12	1080	250
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Prot	NA	pm+ov
Protected Phases	4	4	5	8	8		5	2	1	6	4
Permitted Phases			4			8					6
Detector Phase	4	4	5	8	8	8	5	2	1	6	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	9.6	30.8	15.8
Total Split (s)	26.8	26.8	19.0	35.6	35.6	35.6	19.0	48.0	9.6	38.6	26.8
Total Split (%)	22.3%	22.3%	15.8%	29.7%	29.7%	29.7%	15.8%	40.0%	8.0%	32.2%	22.3%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max	None	Max	None
Act Effct Green (s)	21.3	21.3	38.2	13.6	13.6	13.6	14.6	50.9	5.1	33.2	54.5
Actuated g/C Ratio	0.21	0.21	0.38	0.14	0.14	0.14	0.15	0.51	0.05	0.33	0.54
v/c Ratio	1.00	0.95	0.61	0.06	0.20	0.12	0.86	0.75	0.15	0.98	0.29
Control Delay	90.7	78.4	5.5	37.7	40.5	0.7	62.1	25.7	54.3	57.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.7	78.4	5.5	37.7	40.5	0.7	62.1	25.7	54.3	57.1	5.8
LOS	F	E	A	D	D	A	E	C	D	E	A
Approach Delay		49.1			24.9			34.2		47.5	
Approach LOS		D			C			C		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 42.2	Intersection LOS: D
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	634	2	518	13	48	38	383	1262	1	12	1080	250
Future Volume (veh/h)	634	2	518	13	48	38	383	1262	1	12	1080	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	690	0	435	14	52	24	416	1372	1	13	1174	202
Adj No. of Lanes	2	0	1	1	1	1	2	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	731	0	576	170	188	159	476	1707	1	26	1203	875
Arrive On Green	0.21	0.00	0.21	0.10	0.10	0.10	0.14	0.46	0.46	0.02	0.33	0.33
Sat Flow, veh/h	3429	0	1615	1714	1900	1605	3326	3702	3	1714	3610	1593
Grp Volume(v), veh/h	690	0	435	14	52	24	416	669	704	13	1174	202
Grp Sat Flow(s),veh/h/ln	1714	0	1615	1714	1900	1605	1663	1805	1900	1714	1805	1593
Q Serve(g_s), s	19.5	0.0	21.0	0.7	2.5	1.3	12.1	31.2	31.2	0.7	31.6	6.5
Cycle Q Clear(g_c), s	19.5	0.0	21.0	0.7	2.5	1.3	12.1	31.2	31.2	0.7	31.6	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	731	0	576	170	188	159	476	832	876	26	1203	875
V/C Ratio(X)	0.94	0.00	0.76	0.08	0.28	0.15	0.87	0.80	0.80	0.50	0.98	0.23
Avail Cap(c_a), veh/h	731	0	576	540	598	506	486	832	876	87	1203	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	0.0	27.9	40.3	41.1	40.6	41.3	22.7	22.7	48.1	32.4	11.6
Incr Delay (d2), s/veh	20.7	0.0	5.7	0.2	0.8	0.4	15.1	8.1	7.7	5.4	20.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.0	11.2	0.4	1.4	0.6	6.5	17.3	18.1	0.4	19.1	4.4
LnGrp Delay(d),s/veh	58.8	0.0	33.6	40.5	41.9	41.0	56.4	30.8	30.4	53.5	53.2	12.2
LnGrp LOS	E		C	D	D	D	E	C	C	D	D	B
Approach Vol, veh/h		1125			90			1789			1389	
Approach Delay, s/veh		49.0			41.4			36.6			47.3	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	51.2		26.8	18.7	38.6		14.3
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	42.2		21.0	14.4	32.8		31.0
Max Q Clear Time (g_c+I1), s	2.7	33.2		23.0	14.1	33.6		4.5
Green Ext Time (p_c), s	0.0	8.5		0.0	0.0	0.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	43.3
HCM 2010 LOS	D

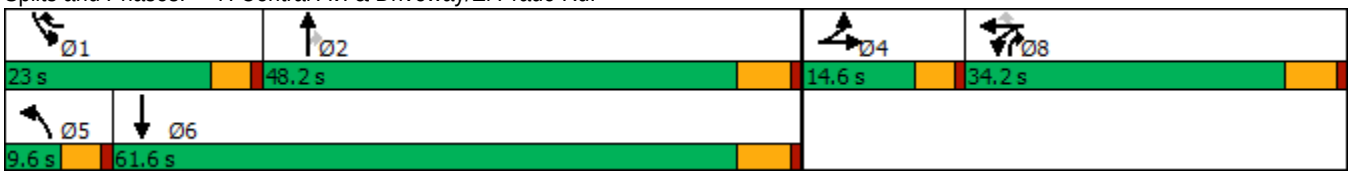
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	30	6	602	5	398	10	1022	597	393	1018
Future Volume (vph)	30	6	602	5	398	10	1022	597	393	1018
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	34.2	34.2	23.0	9.6	48.2	34.2	23.0	61.6
Total Split (%)	12.2%	12.2%	28.5%	28.5%	19.2%	8.0%	40.2%	28.5%	19.2%	51.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.1	10.1	26.3	26.3	49.0	5.1	43.0	69.3	16.8	62.7
Actuated g/C Ratio	0.09	0.09	0.23	0.23	0.43	0.04	0.38	0.61	0.15	0.55
v/c Ratio	0.20	0.18	0.83	0.80	0.53	0.13	0.78	0.54	0.83	0.38
Control Delay	54.9	25.7	62.4	58.4	18.1	59.4	37.8	3.9	63.5	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	25.7	62.4	58.4	18.1	59.4	37.8	3.9	63.5	16.4
LOS	D	C	E	E	B	E	D	A	E	B
Approach Delay		40.5		43.6			25.5			29.3
Approach LOS		D		D			C			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 113.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 31.5 — Intersection LOS: C
Intersection Capacity Utilization 77.9% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	6	23	602	5	398	10	1022	597	393	1018	20
Future Volume (veh/h)	30	6	23	602	5	398	10	1022	597	393	1018	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	31	6	15	631	0	264	10	1065	446	409	1060	17
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	124	35	87	733	0	573	21	1388	958	469	2700	43
Arrive On Green	0.07	0.07	0.07	0.21	0.00	0.21	0.01	0.38	0.38	0.14	0.51	0.51
Sat Flow, veh/h	1714	482	1205	3429	0	1615	1714	3610	1593	3326	5257	84
Grp Volume(v), veh/h	31	0	21	631	0	264	10	1065	446	409	697	380
Grp Sat Flow(s),veh/h/ln	1714	0	1687	1714	0	1615	1714	1805	1593	1663	1729	1883
Q Serve(g_s), s	1.9	0.0	1.3	19.6	0.0	13.9	0.6	28.4	17.2	13.3	13.5	13.6
Cycle Q Clear(g_c), s	1.9	0.0	1.3	19.6	0.0	13.9	0.6	28.4	17.2	13.3	13.5	13.6
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	124	0	122	733	0	573	21	1388	958	469	1776	967
V/C Ratio(X)	0.25	0.00	0.17	0.86	0.00	0.46	0.49	0.77	0.47	0.87	0.39	0.39
Avail Cap(c_a), veh/h	155	0	153	883	0	644	78	1388	958	555	1776	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	0.0	48.1	41.8	0.0	27.4	54.2	29.6	12.4	46.4	16.3	16.3
Incr Delay (d2), s/veh	0.4	0.0	0.2	7.5	0.0	0.6	6.5	4.1	1.6	11.2	0.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.6	10.1	0.0	6.3	0.3	15.0	12.1	6.8	6.6	7.4
LnGrp Delay(d),s/veh	48.7	0.0	48.3	49.3	0.0	28.0	60.7	33.8	14.0	57.6	17.0	17.5
LnGrp LOS	D		D	D		C	E	C	B	E	B	B
Approach Vol, veh/h		52			895			1521			1486	
Approach Delay, s/veh		48.6			43.0			28.1			28.3	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.2	48.2		12.6	5.9	62.4		29.4
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	18.4	42.4		10.0	5.0	55.8		28.4
Max Q Clear Time (g_c+I1), s	15.3	30.4		3.9	2.6	15.6		21.6
Green Ext Time (p_c), s	0.3	8.3		0.0	0.0	11.8		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

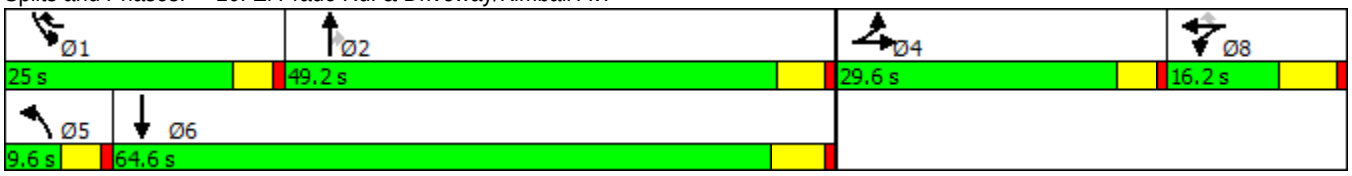
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	40	10	4	794	5	76	105	895	54
Future Volume (vph)	40	10	4	794	5	76	105	895	54
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	25.0	9.6	49.2	49.2	25.0	64.6
Total Split (%)	24.7%	24.7%	13.5%	20.8%	8.0%	41.0%	41.0%	20.8%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	13.0	13.0	10.7	34.0	5.4	11.0	11.0	21.9	26.9
Actuated g/C Ratio	0.20	0.20	0.16	0.52	0.08	0.17	0.17	0.34	0.41
v/c Ratio	0.12	0.06	0.24	0.67	0.04	0.25	0.28	0.85	0.10
Control Delay	25.9	18.0	32.6	4.5	36.2	31.8	4.4	34.5	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	18.0	32.6	4.5	36.2	31.8	4.4	34.5	15.3
LOS	C	B	C	A	D	C	A	C	B
Approach Delay		23.2	6.8			16.4			33.1
Approach LOS		C	A			B			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 65.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 20.4 — Intersection LOS: C
Intersection Capacity Utilization 77.8% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	10	10	66	4	794	5	76	105	895	54	15
Future Volume (veh/h)	40	10	10	66	4	794	5	76	105	895	54	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	42	11	9	69	4	385	5	80	110	942	57	15
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	173	98	80	250	15	716	125	277	236	990	537	141
Arrive On Green	0.10	0.10	0.10	0.15	0.15	0.15	0.07	0.15	0.15	0.30	0.37	0.37
Sat Flow, veh/h	1714	968	792	1715	99	1615	1714	1900	1615	3326	1449	381
Grp Volume(v), veh/h	42	0	20	73	0	385	5	80	110	942	0	72
Grp Sat Flow(s),veh/h/ln	1714	0	1760	1814	0	1615	1714	1900	1615	1663	0	1831
Q Serve(g_s), s	1.5	0.0	0.7	2.5	0.0	10.0	0.2	2.6	4.3	19.0	0.0	1.8
Cycle Q Clear(g_c), s	1.5	0.0	0.7	2.5	0.0	10.0	0.2	2.6	4.3	19.0	0.0	1.8
Prop In Lane	1.00		0.45	0.95		1.00	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	173	0	178	265	0	716	125	277	236	990	0	679
V/C Ratio(X)	0.24	0.00	0.11	0.28	0.00	0.54	0.04	0.29	0.47	0.95	0.00	0.11
Avail Cap(c_a), veh/h	625	0	642	265	0	716	125	1220	1037	990	0	1571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	28.0	26.0	0.0	13.9	29.5	26.1	26.8	23.6	0.0	14.1
Incr Delay (d2), s/veh	0.7	0.0	0.3	0.6	0.0	0.8	0.0	0.6	1.4	17.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.4	1.3	0.0	5.4	0.1	1.4	2.0	11.1	0.0	0.9
LnGrp Delay(d),s/veh	29.1	0.0	28.3	26.6	0.0	14.7	29.6	26.7	28.3	41.4	0.0	14.2
LnGrp LOS	C		C	C		B	C	C	C	D		B
Approach Vol, veh/h		62			458			195			1014	
Approach Delay, s/veh		28.8			16.6			27.6			39.5	
Approach LOS		C			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.0	15.8		11.5	9.6	31.2		16.2
Change Period (Y+Rc), s	4.6	* 5.8		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	20.4	* 44		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	21.0	6.3		3.5	2.2	3.8		12.0
Green Ext Time (p_c), s	0.0	1.2		0.2	0.0	1.2		0.0

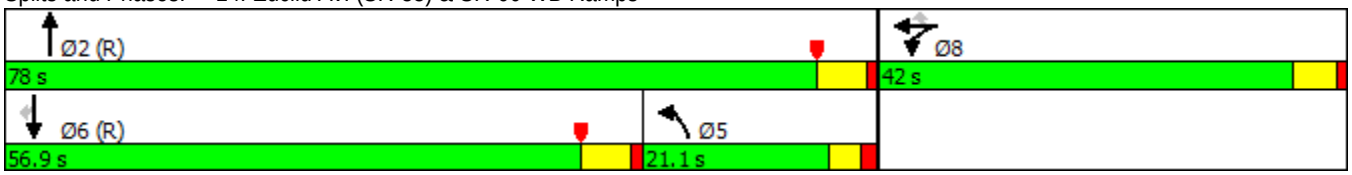
Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	734	8	601	345	1629	1347	807
Future Volume (vph)	734	8	601	345	1629	1347	807
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	42.0	42.0	42.0	21.1	78.0	56.9	56.9
Total Split (%)	35.0%	35.0%	35.0%	17.6%	65.0%	47.4%	47.4%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lag		Lead	Lead
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	37.2	37.2	37.2	15.7	72.3	52.1	52.1
Actuated g/C Ratio	0.31	0.31	0.31	0.13	0.60	0.43	0.43
v/c Ratio	0.97	0.95	0.87	0.84	0.79	0.90	0.81
Control Delay	74.8	69.3	50.7	54.2	11.5	41.3	13.4
Queue Delay	0.0	0.3	0.0	0.0	1.1	46.2	0.0
Total Delay	74.8	69.5	50.7	54.2	12.6	87.5	13.4
LOS	E	E	D	D	B	F	B
Approach Delay		65.4			19.9	59.7	
Approach LOS		E			B	E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 46.7	Intersection LOS: D
Intersection Capacity Utilization 100.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	734	8	601	345	1629	0	0	1347	807
Future Volume (veh/h)	0	0	0	734	8	601	345	1629	0	0	1347	807
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1800	1900	1900	1800	1900	0	0	1900	1900
Adj Flow Rate, veh/h				925	0	322	363	1715	0	0	1418	849
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				991	0	461	497	2251	0	0	1546	679
Arrive On Green				0.29	0.00	0.29	0.30	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3429	0	1594	3326	3705	0	0	3705	1585
Grp Volume(v), veh/h				925	0	322	363	1715	0	0	1418	849
Grp Sat Flow(s),veh/h/ln				1714	0	1594	1663	1805	0	0	1805	1585
Q Serve(g_s), s				31.5	0.0	21.6	11.8	0.0	0.0	0.0	44.4	51.4
Cycle Q Clear(g_c), s				31.5	0.0	21.6	11.8	0.0	0.0	0.0	44.4	51.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				991	0	461	497	2251	0	0	1546	679
V/C Ratio(X)				0.93	0.00	0.70	0.73	0.76	0.00	0.00	0.92	1.25
Avail Cap(c_a), veh/h				1057	0	492	497	2251	0	0	1546	679
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.50	0.50	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				41.5	0.0	38.0	39.9	0.0	0.0	0.0	32.3	34.3
Incr Delay (d2), s/veh				13.5	0.0	3.2	2.4	1.3	0.0	0.0	10.1	124.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.8	0.0	9.9	5.5	0.4	0.0	0.0	24.2	45.9
LnGrp Delay(d),s/veh				55.1	0.0	41.2	42.3	1.3	0.0	0.0	42.4	158.9
LnGrp LOS				E		D	D	A			D	F
Approach Vol, veh/h					1247			2078			2267	
Approach Delay, s/veh					51.5			8.4			86.0	
Approach LOS					D			A			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.3			23.4	56.9		39.7
Change Period (Y+Rc), s		5.5			5.5	* 5.5		5.0
Max Green Setting (Gmax), s		72.5			16.6	* 51		37.0
Max Q Clear Time (g_c+I1), s		2.0			13.8	53.4		33.5
Green Ext Time (p_c), s		36.9			2.0	0.0		1.2

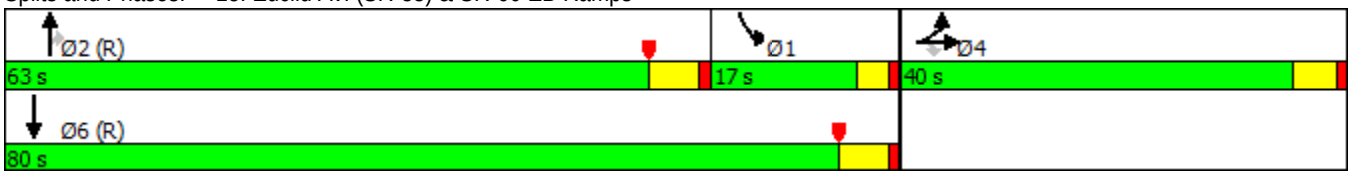
Intersection Summary	
HCM 2010 Ctrl Delay	49.5
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	592	2	506	1382	511	277	1804
Future Volume (vph)	592	2	506	1382	511	277	1804
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	40.0	40.0	40.0	63.0	63.0	17.0	80.0
Total Split (%)	33.3%	33.3%	33.3%	52.5%	52.5%	14.2%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	32.2	32.2	32.2	60.7	60.7	12.5	77.3
Actuated g/C Ratio	0.27	0.27	0.27	0.51	0.51	0.10	0.64
v/c Ratio	0.90	0.87	0.75	0.77	0.51	0.82	0.79
Control Delay	66.8	60.2	42.3	46.7	20.6	66.2	20.2
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	47.6
Total Delay	66.8	60.2	42.3	46.9	20.6	66.2	67.8
LOS	E	E	D	D	C	E	E
Approach Delay		56.9		39.8			67.6
Approach LOS		E		D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 54.9	Intersection LOS: D
Intersection Capacity Utilization 100.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	592	2	506	0	0	0	0	1382	511	277	1804	0
Future Volume (veh/h)	592	2	506	0	0	0	0	1382	511	277	1804	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900				0	1900	1900	1800	1900	0
Adj Flow Rate, veh/h	742	0	294				0	1410	521	283	1841	0
Adj No. of Lanes	2	0	1				0	2	1	2	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	820	0	386				0	1627	716	588	2430	0
Arrive On Green	0.24	0.00	0.24				0.00	0.60	0.60	0.35	1.00	0.00
Sat Flow, veh/h	3429	0	1615				0	3705	1588	3326	3705	0
Grp Volume(v), veh/h	742	0	294				0	1410	521	283	1841	0
Grp Sat Flow(s),veh/h/ln	1714	0	1615				0	1805	1588	1663	1805	0
Q Serve(g_s), s	25.2	0.0	20.3				0.0	39.1	28.0	8.0	0.0	0.0
Cycle Q Clear(g_c), s	25.2	0.0	20.3				0.0	39.1	28.0	8.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	820	0	386				0	1627	716	588	2430	0
V/C Ratio(X)	0.90	0.00	0.76				0.00	0.87	0.73	0.48	0.76	0.00
Avail Cap(c_a), veh/h	1000	0	471				0	1730	761	588	2430	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.33	1.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.52	0.52	0.27	0.27	0.00
Uniform Delay (d), s/veh	44.3	0.0	42.5				0.0	21.0	18.8	34.5	0.0	0.0
Incr Delay (d2), s/veh	9.0	0.0	4.4				0.0	3.5	3.4	0.1	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	0.0	9.5				0.0	20.1	12.8	3.6	0.2	0.0
LnGrp Delay(d),s/veh	53.4	0.0	46.9				0.0	24.6	22.2	34.6	0.6	0.0
LnGrp LOS	D		D					C	C	C	A	
Approach Vol, veh/h		1036						1931			2124	
Approach Delay, s/veh		51.5						23.9			5.1	
Approach LOS		D						C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	26.7	59.6		33.7		86.3		
Change Period (Y+Rc), s	5.5	* 5.5		5.0		5.5		
Max Green Setting (Gmax), s	13.0	* 58		35.0		74.5		
Max Q Clear Time (g_c+I1), s	10.0	41.1		27.2		2.0		
Green Ext Time (p_c), s	2.9	13.0		1.5		41.8		

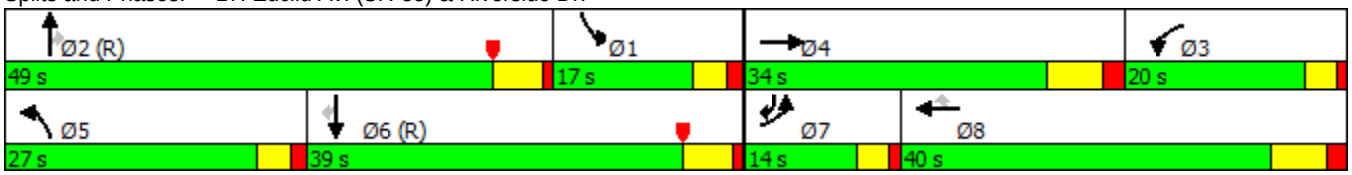
Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	192	492	233	441	70	297	1534	605	166	1737	227
Future Volume (vph)	192	492	233	441	70	297	1534	605	166	1737	227
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	34.0	20.0	40.0	40.0	27.0	49.0	49.0	17.0	39.0	14.0
Total Split (%)	11.7%	28.3%	16.7%	33.3%	33.3%	22.5%	40.8%	40.8%	14.2%	32.5%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	10.0	26.6	16.4	33.0	33.0	22.5	43.5	43.5	12.5	33.5	45.0
Actuated g/C Ratio	0.08	0.22	0.14	0.28	0.28	0.19	0.36	0.36	0.10	0.28	0.38
v/c Ratio	1.45	0.90	1.08	0.48	0.14	1.00	0.88	0.81	1.00	1.29	0.36
Control Delay	276.6	58.7	130.0	38.2	0.5	80.7	45.0	33.7	100.6	164.8	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	276.6	58.7	130.0	38.2	0.5	80.7	45.0	33.7	100.6	164.8	16.0
LOS	F	E	F	D	A	F	D	C	F	F	B
Approach Delay		107.0		63.5			46.5			144.0	
Approach LOS		F		E			D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 63 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 90.7	Intersection LOS: F
Intersection Capacity Utilization 101.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	492	180	233	441	70	297	1534	605	166	1737	227
Future Volume (veh/h)	192	492	180	233	441	70	297	1534	605	166	1737	227
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	206	529	160	251	474	75	319	1649	520	178	1868	146
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	143	589	177	229	1048	462	321	1859	579	1224	4633	1558
Arrive On Green	0.08	0.22	0.22	0.13	0.29	0.29	0.06	0.12	0.12	0.24	0.29	0.29
Sat Flow, veh/h	1714	2736	824	1714	3610	1592	1714	5187	1615	1714	5187	1594
Grp Volume(v), veh/h	206	348	341	251	474	75	319	1649	520	178	1868	146
Grp Sat Flow(s),veh/h/ln	1714	1805	1755	1714	1805	1592	1714	1729	1615	1714	1729	1594
Q Serve(g_s), s	10.0	22.5	22.7	16.0	12.9	3.1	22.3	37.6	38.1	9.9	34.6	1.8
Cycle Q Clear(g_c), s	10.0	22.5	22.7	16.0	12.9	3.1	22.3	37.6	38.1	9.9	34.6	1.8
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	143	389	378	229	1048	462	321	1859	579	1224	4633	1558
V/C Ratio(X)	1.44	0.90	0.90	1.10	0.45	0.16	0.99	0.89	0.90	0.15	0.40	0.09
Avail Cap(c_a), veh/h	143	406	395	229	1048	462	321	1880	585	1224	4633	1558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.51	0.51	0.51	0.42	0.42	0.42
Uniform Delay (d), s/veh	55.0	45.8	45.9	52.0	34.8	17.1	56.2	50.5	50.8	16.9	16.7	0.4
Incr Delay (d2), s/veh	233.9	21.9	23.3	88.3	0.4	0.2	33.9	3.6	11.3	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	13.6	13.4	13.2	6.4	1.4	13.6	18.6	18.9	4.7	16.7	0.8
LnGrp Delay(d),s/veh	288.9	67.7	69.2	140.3	35.2	17.3	90.1	54.1	62.0	16.9	16.8	0.4
LnGrp LOS	F	E	E	F	D	B	F	D	E	B	B	A
Approach Vol, veh/h		895			800			2488			2192	
Approach Delay, s/veh		119.2			66.5			60.4			15.7	
Approach LOS		F			E			E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	93.0	48.5	23.0	32.8	27.0	114.5	14.0	41.8
Change Period (Y+Rc), s	5.5	* 5.5	7.0	* 7	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	12.5	* 44	16.0	* 27	22.5	33.5	10.0	33.0
Max Q Clear Time (g_c+I1), s	11.9	40.1	18.0	24.7	24.3	36.6	12.0	14.9
Green Ext Time (p_c), s	0.2	2.9	0.0	1.1	0.0	0.0	0.0	4.2

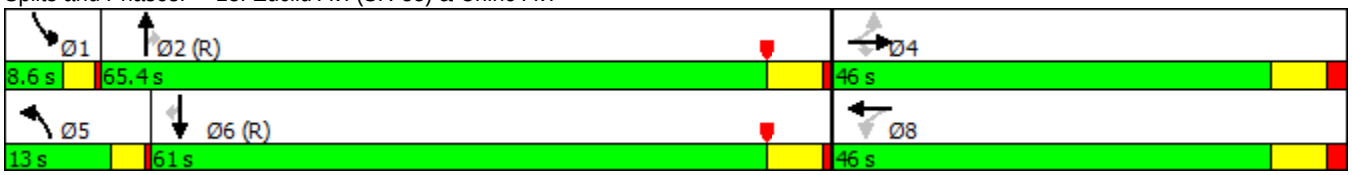
Intersection Summary	
HCM 2010 Ctrl Delay	54.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	89	222	58	164	202	74	2382	431	50	1891	115
Future Volume (vph)	89	222	58	164	202	74	2382	431	50	1891	115
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0	13.0	65.4	65.4	8.6	61.0	61.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	10.8%	54.5%	54.5%	7.2%	50.8%	50.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.5	26.5	26.5	26.5	26.5	9.1	71.2	71.2	7.6	69.7	69.7
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.08	0.59	0.59	0.06	0.58	0.58
v/c Ratio	0.68	0.55	0.14	0.92	0.70	0.59	0.80	0.45	0.49	0.65	0.12
Control Delay	65.2	45.0	2.9	93.1	48.5	47.4	34.6	23.8	66.5	5.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.2	45.0	2.9	93.1	48.5	47.4	34.6	23.8	66.5	5.8	0.2
LOS	E	D	A	F	D	D	C	C	E	A	A
Approach Delay		43.2			64.9		33.3			7.0	
Approach LOS		D			E		C			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 119 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 27.0	Intersection LOS: C
Intersection Capacity Utilization 91.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	222	58	164	202	79	74	2382	431	50	1891	115
Future Volume (veh/h)	89	222	58	164	202	79	74	2382	431	50	1891	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	92	229	60	169	208	77	76	2456	388	52	1949	90
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	226	537	457	264	374	139	95	2808	874	66	2719	828
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.07	0.72	0.72	0.08	1.00	1.00
Sat Flow, veh/h	1112	1900	1615	1107	1324	490	1714	5187	1615	1714	5187	1580
Grp Volume(v), veh/h	92	229	60	169	0	285	76	2456	388	52	1949	90
Grp Sat Flow(s),veh/h/ln	1112	1900	1615	1107	0	1814	1714	1729	1615	1714	1729	1580
Q Serve(g_s), s	9.2	11.8	3.3	17.6	0.0	16.0	5.2	43.0	11.9	3.6	0.0	0.0
Cycle Q Clear(g_c), s	25.3	11.8	3.3	29.4	0.0	16.0	5.2	43.0	11.9	3.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	537	457	264	0	513	95	2808	874	66	2719	828
V/C Ratio(X)	0.41	0.43	0.13	0.64	0.00	0.56	0.80	0.87	0.44	0.79	0.72	0.11
Avail Cap(c_a), veh/h	273	618	525	311	0	589	136	2808	874	73	2719	828
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	47.4	35.1	32.1	47.1	0.0	36.6	54.9	13.7	9.4	54.9	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.5	0.1	3.4	0.0	0.9	1.3	0.4	0.1	4.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	6.3	1.5	5.6	0.0	8.1	2.5	20.1	5.2	1.8	0.0	0.0
LnGrp Delay(d),s/veh	48.5	35.6	32.2	50.4	0.0	37.6	56.2	14.1	9.5	59.2	0.2	0.0
LnGrp LOS	D	D	C	D		D	E	B	A	E	A	A
Approach Vol, veh/h		381			454			2920			2091	
Approach Delay, s/veh		38.2			42.4			14.6			1.6	
Approach LOS		D			D			B			A	

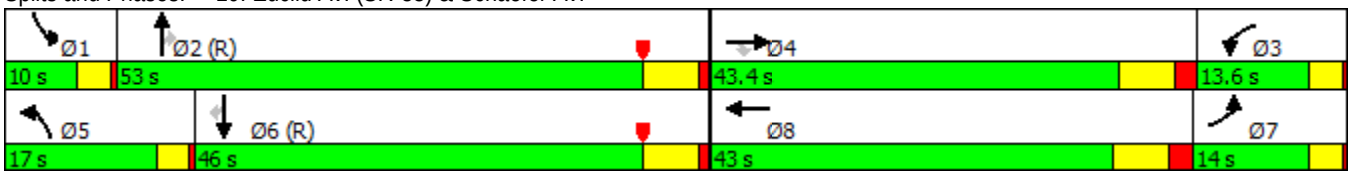
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	71.0		40.9	10.2	68.9		40.9
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.1	59.4		39.0	9.5	55.0		39.0
Max Q Clear Time (g_c+I1), s	5.6	45.0		27.3	7.2	2.0		31.4
Green Ext Time (p_c), s	0.0	14.3		3.2	0.0	50.9		2.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	459	289	237	34	63	214	2357	72	122	2079	364
Future Volume (vph)	459	289	237	34	63	214	2357	72	122	2079	364
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	43.4	43.4	13.6	43.0	17.0	53.0	53.0	10.0	46.0	46.0
Total Split (%)	11.7%	36.2%	36.2%	11.3%	35.8%	14.2%	44.2%	44.2%	8.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	28.0	36.4	36.4	11.9	14.9	17.1	47.0	47.0	10.1	40.0	40.0
Actuated g/C Ratio	0.23	0.30	0.30	0.10	0.12	0.14	0.39	0.39	0.08	0.33	0.33
v/c Ratio	0.63	0.52	0.37	0.21	0.51	0.88	1.20	0.11	0.88	1.24	0.59
Control Delay	47.3	40.5	5.9	52.7	36.7	53.2	113.6	1.6	101.6	149.9	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	40.5	5.9	52.7	36.7	53.2	113.6	1.6	101.6	149.9	27.2
LOS	D	D	A	D	D	D	F	A	F	F	C
Approach Delay		35.3			40.1		105.6			130.2	
Approach LOS		D			D		F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 103.0	Intersection LOS: F
Intersection Capacity Utilization 93.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	459	289	237	34	63	64	214	2357	72	122	2079	364
Future Volume (veh/h)	459	289	237	34	63	64	214	2357	72	122	2079	364
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1768	1900	1900	1800	1900	1900	1872	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	473	298	168	35	65	61	221	2430	65	126	2143	322
Adj No. of Lanes	2	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	468	344	293	91	82	77	201	2826	880	93	2523	768
Arrive On Green	0.14	0.18	0.18	0.05	0.09	0.09	0.15	0.72	0.72	0.11	0.97	0.97
Sat Flow, veh/h	3267	1900	1615	1714	903	847	1783	5187	1615	1714	5187	1579
Grp Volume(v), veh/h	473	298	168	35	0	126	221	2430	65	126	2143	322
Grp Sat Flow(s),veh/h/ln	1633	1900	1615	1714	0	1750	1783	1729	1615	1714	1729	1579
Q Serve(g_s), s	17.2	18.3	8.6	2.4	0.0	8.5	13.5	41.1	1.0	6.5	7.7	0.6
Cycle Q Clear(g_c), s	17.2	18.3	8.6	2.4	0.0	8.5	13.5	41.1	1.0	6.5	7.7	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	468	344	293	91	0	160	201	2826	880	93	2523	768
V/C Ratio(X)	1.01	0.87	0.57	0.38	0.00	0.79	1.10	0.86	0.07	1.36	0.85	0.42
Avail Cap(c_a), veh/h	468	576	490	144	0	525	201	2826	880	93	2523	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.71	0.71	0.71
Uniform Delay (d), s/veh	51.4	47.7	25.6	54.9	0.0	53.4	51.0	13.2	3.9	53.5	0.9	0.3
Incr Delay (d2), s/veh	44.4	5.8	1.3	1.0	0.0	6.4	53.3	0.3	0.0	202.1	2.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	10.2	3.9	1.2	0.0	4.4	9.6	19.3	0.4	8.3	2.2	0.4
LnGrp Delay(d),s/veh	95.8	53.5	27.0	55.9	0.0	59.8	104.4	13.5	3.9	255.6	3.7	1.5
LnGrp LOS	F	D	C	E		E	F	B	A	F	A	A
Approach Vol, veh/h		939			161			2716			2591	
Approach Delay, s/veh		70.1			58.9			20.7			15.7	
Approach LOS		E			E			C			B	

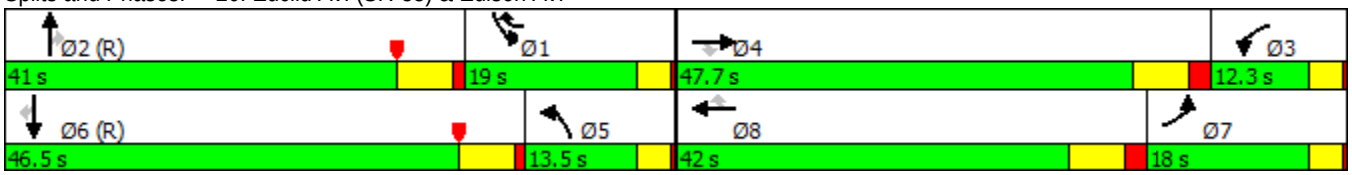
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	71.4	9.9	28.8	17.0	64.4	20.7	17.9
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	6.5	47.0	10.1	36.4	13.5	40.0	10.5	36.0
Max Q Clear Time (g_c+I1), s	8.5	43.1	4.4	20.3	15.5	9.7	19.2	10.5
Green Ext Time (p_c), s	0.0	3.9	0.0	1.5	0.0	29.7	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	26.8
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	465	1072	337	165	509	507	191	1752	225	536	1502	217
Future Volume (vph)	465	1072	337	165	509	507	191	1752	225	536	1502	217
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	8.5	42.0	8.5	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	18.0	47.7	47.7	12.3	42.0	19.0	13.5	41.0	41.0	19.0	46.5	46.5
Total Split (%)	15.0%	39.8%	39.8%	10.3%	35.0%	15.8%	11.3%	34.2%	34.2%	15.8%	38.8%	38.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	25.6	39.7	39.7	9.5	23.6	46.1	11.5	35.3	35.3	15.5	39.3	39.3
Actuated g/C Ratio	0.21	0.33	0.33	0.08	0.20	0.38	0.10	0.29	0.29	0.13	0.33	0.33
v/c Ratio	0.67	0.87	0.52	0.66	0.70	0.79	0.63	1.03	0.38	1.31	0.80	0.33
Control Delay	49.6	46.4	14.6	66.8	49.4	37.5	38.6	48.1	4.3	183.0	21.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	46.4	14.6	66.8	49.4	37.5	38.6	48.1	4.3	183.0	21.5	6.4
LOS	D	D	B	E	D	D	D	D	A	F	C	A
Approach Delay		41.5			46.7			42.7			58.4	
Approach LOS		D			D			D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 51 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 47.8	Intersection LOS: D
Intersection Capacity Utilization 103.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	465	1072	337	165	509	507	191	1752	225	536	1502	217
Future Volume (veh/h)	465	1072	337	165	509	507	191	1752	225	536	1502	217
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1768	1900	1900	1700	1900	1900	1700	1976	1900	1700	1976	1900
Adj Flow Rate, veh/h	474	1094	191	168	519	262	195	1788	128	547	1533	119
Adj No. of Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	697	1218	510	219	689	541	418	1729	471	497	1873	510
Arrive On Green	0.21	0.32	0.32	0.07	0.18	0.18	0.17	0.39	0.39	0.05	0.10	0.10
Sat Flow, veh/h	3368	3800	1592	3238	3800	1615	3238	5928	1615	3238	5928	1615
Grp Volume(v), veh/h	474	1094	191	168	519	262	195	1788	128	547	1533	119
Grp Sat Flow(s),veh/h/ln	1684	1900	1592	1619	1900	1615	1619	1976	1615	1619	1976	1615
Q Serve(g_s), s	15.6	33.0	11.1	6.1	15.5	0.0	6.5	35.0	6.5	18.4	30.4	8.1
Cycle Q Clear(g_c), s	15.6	33.0	11.1	6.1	15.5	0.0	6.5	35.0	6.5	18.4	30.4	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	697	1218	510	219	689	541	418	1729	471	497	1873	510
V/C Ratio(X)	0.68	0.90	0.37	0.77	0.75	0.48	0.47	1.03	0.27	1.10	0.82	0.23
Avail Cap(c_a), veh/h	697	1289	540	237	1108	719	418	1729	471	497	2001	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	43.9	38.9	31.5	55.0	46.6	31.7	46.0	36.7	28.0	57.0	50.4	40.4
Incr Delay (d2), s/veh	2.2	8.4	0.5	11.2	1.7	0.7	0.0	17.8	0.1	48.9	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	18.7	4.9	3.1	8.3	6.9	2.9	21.8	2.9	11.6	16.7	3.7
LnGrp Delay(d),s/veh	46.1	47.3	31.9	66.2	48.3	32.4	46.0	54.5	28.1	105.9	50.8	40.5
LnGrp LOS	D	D	C	E	D	C	D	F	C	F	D	D
Approach Vol, veh/h		1759			949			2111			2199	
Approach Delay, s/veh		45.3			47.1			52.1			63.9	
Approach LOS		D			D			D			E	

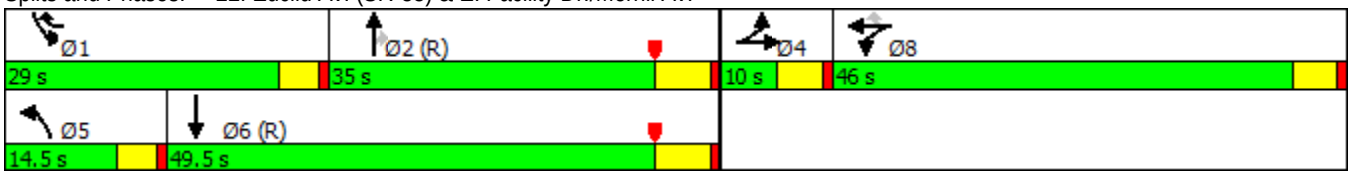
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.9	41.0	11.6	45.5	19.0	43.9	28.3	28.8
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	15.5	35.0	8.8	40.7	10.0	40.5	14.5	35.0
Max Q Clear Time (g_c+I1), s	20.4	37.0	8.1	35.0	8.5	32.4	17.6	17.5
Green Ext Time (p_c), s	0.0	0.0	0.0	3.5	0.3	5.5	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	53.4
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	27	0	422	2	1985	251	612	1814
Future Volume (vph)	27	0	422	2	1985	251	612	1814
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	29.0	14.5	35.0	35.0	29.0	49.5
Total Split (%)	8.3%	38.3%	24.2%	12.1%	29.2%	29.2%	24.2%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	21.6	56.0	10.0	45.5	45.5	29.4	76.5
Actuated g/C Ratio	0.04	0.18	0.47	0.08	0.38	0.38	0.24	0.64
v/c Ratio	0.57	0.58	0.55	0.01	1.05	0.39	0.83	0.59
Control Delay	70.0	50.9	17.4	67.0	61.7	6.7	43.7	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.0	50.9	17.4	67.0	61.7	6.7	43.7	9.9
LOS	E	D	B	E	E	A	D	A
Approach Delay	70.0	27.2			55.6			18.4
Approach LOS	E	C			E			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 93 (78%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 35.5	Intersection LOS: D
Intersection Capacity Utilization 87.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	27	14	176	0	422	2	1985	251	612	1814	1
Future Volume (veh/h)	6	27	14	176	0	422	2	1985	251	612	1814	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1976	1900	1768	1900	1900
Adj Flow Rate, veh/h	6	29	7	189	0	239	2	2134	241	658	1951	1
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	8	40	10	251	0	554	9	2454	725	667	3501	2
Arrive On Green	0.03	0.03	0.03	0.14	0.00	0.14	0.01	0.45	0.45	0.20	0.65	0.65
Sat Flow, veh/h	262	1266	305	1810	0	1615	1714	5394	1594	3267	5355	3
Grp Volume(v), veh/h	42	0	0	189	0	239	2	2134	241	658	1260	692
Grp Sat Flow(s),veh/h/ln	1833	0	0	1810	0	1615	1714	1798	1594	1633	1729	1899
Q Serve(g_s), s	2.7	0.0	0.0	12.1	0.0	13.7	0.1	42.8	11.6	24.1	23.8	23.8
Cycle Q Clear(g_c), s	2.7	0.0	0.0	12.1	0.0	13.7	0.1	42.8	11.6	24.1	23.8	23.8
Prop In Lane	0.14		0.17	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	58	0	0	251	0	554	9	2454	725	667	2261	1242
V/C Ratio(X)	0.73	0.00	0.00	0.75	0.00	0.43	0.22	0.87	0.33	0.99	0.56	0.56
Avail Cap(c_a), veh/h	76	0	0	618	0	882	143	2454	725	667	2261	1242
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.6	0.0	0.0	49.7	0.0	30.4	59.4	29.5	21.0	47.6	11.3	11.3
Incr Delay (d2), s/veh	13.1	0.0	0.0	1.7	0.0	0.2	2.9	3.1	0.8	31.3	1.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	6.2	0.0	6.1	0.1	21.9	5.3	13.8	11.5	12.9
LnGrp Delay(d),s/veh	70.7	0.0	0.0	51.4	0.0	30.6	62.3	32.6	21.8	78.9	12.3	13.1
LnGrp LOS	E			D		C	E	C	C	E	B	B
Approach Vol, veh/h		42			428			2377			2610	
Approach Delay, s/veh		70.7			39.8			31.5			29.3	
Approach LOS		E			D			C			C	

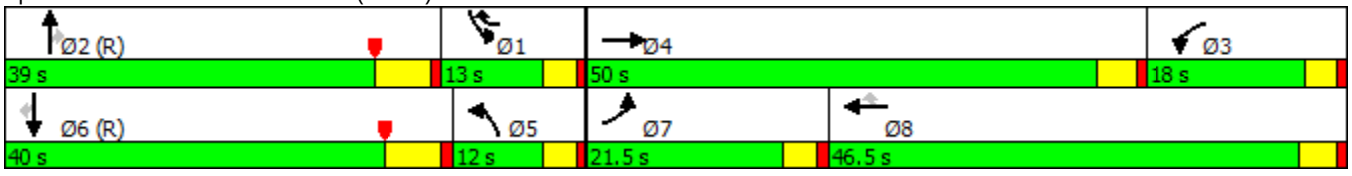
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	60.6		8.8	5.1	84.5		21.6
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	24.5	29.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	26.1	44.8		4.7	2.1	25.8		15.7
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	17.1		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	31.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	277	533	256	409	306	195	1317	282	325	1272	226
Future Volume (vph)	277	533	256	409	306	195	1317	282	325	1272	226
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	3	8	1	5	2		1	6	
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	9.0	45.5	9.0	9.0	36.0	36.0	9.0	33.0	33.0
Total Split (s)	21.5	50.0	18.0	46.5	13.0	12.0	39.0	39.0	13.0	40.0	40.0
Total Split (%)	17.9%	41.7%	15.0%	38.8%	10.8%	10.0%	32.5%	32.5%	10.8%	33.3%	33.3%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	14.9	34.0	13.0	32.1	42.2	9.9	44.9	44.9	9.6	44.6	44.6
Actuated g/C Ratio	0.12	0.28	0.11	0.27	0.35	0.08	0.37	0.37	0.08	0.37	0.37
v/c Ratio	0.74	0.78	0.72	0.44	0.52	1.44	0.71	0.38	1.36	0.69	0.32
Control Delay	51.3	40.7	63.0	37.2	19.0	258.1	26.5	7.7	221.0	24.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	40.7	63.0	37.2	19.0	258.1	26.5	7.7	221.0	24.3	4.8
LOS	D	D	E	D	B	F	C	A	F	C	A
Approach Delay		43.5		38.3			48.7			57.0	
Approach LOS		D		D			D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 27 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.44	
Intersection Signal Delay: 48.6	Intersection LOS: D
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	277	533	232	256	409	306	195	1317	282	325	1272	226
Future Volume (veh/h)	277	533	232	256	409	306	195	1317	282	325	1272	226
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1872	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	289	555	238	267	426	285	203	1372	279	339	1325	217
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	337	630	269	346	911	750	356	1422	443	666	1445	444
Arrive On Green	0.21	0.51	0.51	0.10	0.25	0.25	0.42	0.55	0.55	0.21	0.28	0.28
Sat Flow, veh/h	3141	2465	1054	3459	3610	1615	1714	5187	1615	3141	5187	1594
Grp Volume(v), veh/h	289	406	387	267	426	285	203	1372	279	339	1325	217
Grp Sat Flow(s),veh/h/ln	1570	1805	1714	1729	1805	1615	1714	1729	1615	1570	1729	1594
Q Serve(g_s), s	10.6	24.0	24.2	9.0	12.0	3.6	10.9	30.4	14.3	11.4	29.7	10.0
Cycle Q Clear(g_c), s	10.6	24.0	24.2	9.0	12.0	3.6	10.9	30.4	14.3	11.4	29.7	10.0
Prop In Lane	1.00		0.62	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	337	461	438	346	911	750	356	1422	443	666	1445	444
V/C Ratio(X)	0.86	0.88	0.88	0.77	0.47	0.38	0.57	0.96	0.63	0.51	0.92	0.49
Avail Cap(c_a), veh/h	458	684	650	404	1264	908	356	1426	444	666	1470	452
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.56	1.00	1.00	1.00	0.66	0.66	0.66	0.78	0.78	0.78
Uniform Delay (d), s/veh	46.2	27.7	27.8	52.7	38.0	9.1	31.0	26.6	22.9	41.7	41.9	19.6
Incr Delay (d2), s/veh	5.3	5.3	5.7	6.3	0.1	0.1	0.9	12.7	4.4	0.2	8.7	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	12.4	11.9	4.6	6.0	3.7	5.2	15.9	6.8	5.0	15.3	4.7
LnGrp Delay(d),s/veh	51.6	33.0	33.5	59.0	38.2	9.2	31.9	39.3	27.3	42.0	50.7	22.6
LnGrp LOS	D	C	C	E	D	A	C	D	C	D	D	C
Approach Vol, veh/h		1082			978			1854			1881	
Approach Delay, s/veh		38.1			35.4			36.7			45.8	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.5	38.9	16.5	35.2	28.9	39.4	16.9	34.8
Change Period (Y+Rc), s	4.0	6.0	4.5	* 4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	9.0	33.0	14.0	* 46	8.0	34.0	17.5	42.0
Max Q Clear Time (g_c+I1), s	13.4	32.4	11.0	26.2	12.9	31.7	12.6	14.0
Green Ext Time (p_c), s	0.0	0.5	1.0	4.5	0.0	1.7	0.2	2.5

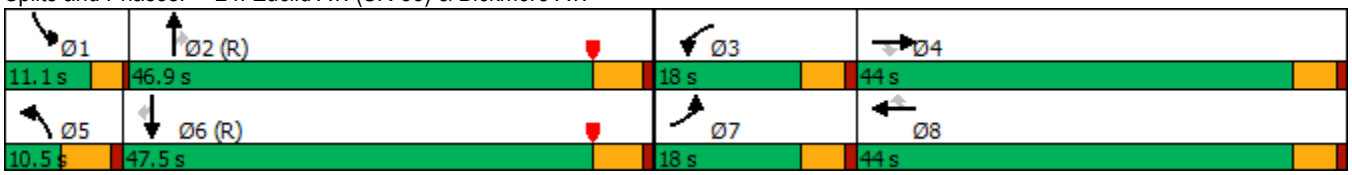
Intersection Summary	
HCM 2010 Ctrl Delay	39.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	58	60	65	18	190	15	1429	52	161	1499	47
Future Volume (vph)	175	58	60	65	18	190	15	1429	52	161	1499	47
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	44.0	44.0	10.0	44.0	44.0	10.5	26.5	26.5	8.5	30.5	30.5
Total Split (s)	18.0	44.0	44.0	18.0	44.0	44.0	10.5	46.9	46.9	11.1	47.5	47.5
Total Split (%)	15.0%	36.7%	36.7%	15.0%	36.7%	36.7%	8.8%	39.1%	39.1%	9.3%	39.6%	39.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	18.1	29.0	29.0	7.1	15.9	15.9	5.4	56.8	56.8	10.1	59.5	59.5
Actuated g/C Ratio	0.15	0.24	0.24	0.06	0.13	0.13	0.04	0.47	0.47	0.08	0.50	0.50
v/c Ratio	0.75	0.14	0.14	0.37	0.08	0.67	0.22	0.65	0.07	0.64	0.65	0.06
Control Delay	68.8	35.5	1.1	59.2	39.4	30.0	62.2	27.0	0.2	42.3	41.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	35.5	1.1	59.2	39.4	30.0	62.2	27.0	0.2	42.3	41.0	7.3
LOS	E	D	A	E	D	C	E	C	A	D	D	A
Approach Delay		48.3			37.6			26.4			40.2	
Approach LOS		D			D			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	58	60	65	18	190	15	1429	52	161	1499	47
Future Volume (veh/h)	175	58	60	65	18	190	15	1429	52	161	1499	47
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	194	64	48	72	20	199	17	1588	48	179	1666	52
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	186	394	335	139	267	227	71	2747	845	211	2773	845
Arrive On Green	0.11	0.21	0.21	0.04	0.14	0.14	0.04	0.53	0.53	0.02	0.18	0.18
Sat Flow, veh/h	1714	1900	1615	3326	1900	1615	1714	5187	1595	3326	5187	1582
Grp Volume(v), veh/h	194	64	48	72	20	199	17	1588	48	179	1666	52
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1663	1900	1615	1714	1729	1595	1663	1729	1582
Q Serve(g_s), s	13.0	3.3	2.9	2.5	1.1	14.5	1.2	24.9	1.8	6.4	35.5	3.3
Cycle Q Clear(g_c), s	13.0	3.3	2.9	2.5	1.1	14.5	1.2	24.9	1.8	6.4	35.5	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	394	335	139	267	227	71	2747	845	211	2773	845
V/C Ratio(X)	1.04	0.16	0.14	0.52	0.07	0.88	0.24	0.58	0.06	0.85	0.60	0.06
Avail Cap(c_a), veh/h	186	618	525	360	618	525	71	2747	845	211	2773	845
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.15	0.15	0.15	0.66	0.66	0.66
Uniform Delay (d), s/veh	53.5	39.0	38.9	56.3	44.8	50.6	55.7	19.1	13.7	58.2	37.6	24.4
Incr Delay (d2), s/veh	78.3	0.1	0.1	1.1	0.0	4.2	0.1	0.1	0.0	18.2	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	1.8	1.3	1.2	0.6	6.7	0.5	11.8	0.8	3.5	17.2	1.5
LnGrp Delay(d),s/veh	131.8	39.1	38.9	57.4	44.8	54.8	55.8	19.3	13.7	76.4	38.3	24.4
LnGrp LOS	F	D	D	E	D	D	E	B	B	E	D	C
Approach Vol, veh/h		306			291			1653			1897	
Approach Delay, s/veh		97.9			54.8			19.5			41.5	
Approach LOS		F			D			B			D	

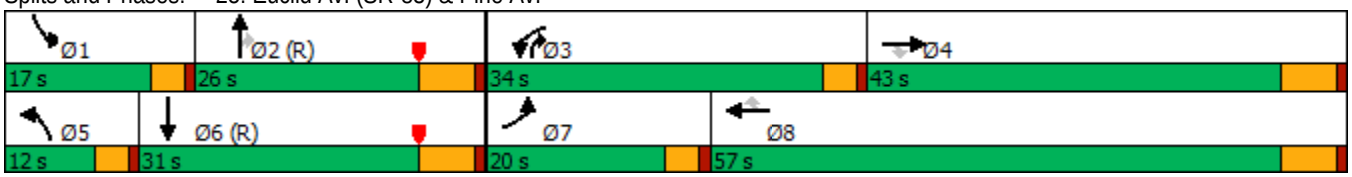
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	69.0	10.0	29.9	10.5	69.6	18.0	21.9
Change Period (Y+Rc), s	3.5	5.5	5.0	5.0	5.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	7.6	41.4	13.0	39.0	5.0	42.0	13.0	39.0
Max Q Clear Time (g_c+I1), s	8.4	26.9	4.5	5.3	3.2	37.5	15.0	16.5
Green Ext Time (p_c), s	0.0	6.1	0.0	0.3	0.0	2.9	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	128	865	367	851	552	297	212	1027	770	318	1215
Future Volume (vph)	128	865	367	851	552	297	212	1027	770	318	1215
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	20.0	43.0	43.0	34.0	57.0	57.0	12.0	26.0	34.0	17.0	31.0
Total Split (%)	16.7%	35.8%	35.8%	28.3%	47.5%	47.5%	10.0%	21.7%	28.3%	14.2%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	12.8	35.4	35.4	30.0	52.7	52.7	9.0	21.4	57.4	13.2	25.6
Actuated g/C Ratio	0.11	0.30	0.30	0.25	0.44	0.44	0.08	0.18	0.48	0.11	0.21
v/c Ratio	0.71	0.77	0.62	1.05	0.33	0.34	0.88	0.98	0.93	0.89	1.04
Control Delay	71.2	43.5	23.5	89.2	22.9	3.4	53.3	61.1	27.0	97.0	79.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.2	43.5	23.5	89.2	22.9	3.4	53.3	61.1	27.0	97.0	79.3
LOS	E	D	C	F	C	A	D	E	C	F	E
Approach Delay		40.8			52.7			47.2			82.8
Approach LOS		D			D			D			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 55.9	Intersection LOS: E
Intersection Capacity Utilization 99.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	865	367	851	552	297	212	1027	770	318	1215	88
Future Volume (veh/h)	128	865	367	851	552	297	212	1027	770	318	1215	88
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1872	1976	1976	1768	1976	1976	1768	1976	1976	1768	1976	1976
Adj Flow Rate, veh/h	132	892	0	877	569	254	219	1059	567	328	1253	29
Adj No. of Lanes	1	2	1	2	2	1	2	3	1	2	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	159	1067	453	842	1704	724	225	1215	764	365	1423	33
Arrive On Green	0.09	0.27	0.00	0.28	0.47	0.47	0.07	0.20	0.20	0.04	0.08	0.08
Sat Flow, veh/h	1783	3952	1680	3368	3952	1680	3368	5928	1680	3368	5769	133
Grp Volume(v), veh/h	132	892	0	877	569	254	219	1059	567	328	858	424
Grp Sat Flow(s),veh/h/ln	1783	1976	1680	1684	1976	1680	1684	1976	1680	1684	1976	1950
Q Serve(g_s), s	8.7	25.5	0.0	30.0	10.8	11.4	7.8	20.7	24.6	11.6	25.8	25.8
Cycle Q Clear(g_c), s	8.7	25.5	0.0	30.0	10.8	11.4	7.8	20.7	24.6	11.6	25.8	25.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	159	1067	453	842	1704	724	225	1215	764	365	975	481
V/C Ratio(X)	0.83	0.84	0.00	1.04	0.33	0.35	0.98	0.87	0.74	0.90	0.88	0.88
Avail Cap(c_a), veh/h	238	1219	518	842	1704	724	225	1215	764	365	975	481
HCM Platoon Ratio	1.00	1.00	1.00	1.10	1.10	1.10	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	0.09	0.09	0.09	0.80	0.80	0.80
Uniform Delay (d), s/veh	53.8	41.3	0.0	43.5	20.8	21.0	55.9	46.2	26.9	57.2	53.4	53.4
Incr Delay (d2), s/veh	9.1	5.1	0.0	42.4	0.2	0.4	12.7	0.9	0.6	19.8	9.2	16.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	14.6	0.0	18.9	5.9	5.4	4.0	11.5	15.5	6.4	15.4	16.2
LnGrp Delay(d),s/veh	62.9	46.4	0.0	85.9	21.0	21.4	68.6	47.1	27.5	77.0	62.6	70.1
LnGrp LOS	E	D		F	C	C	E	D	C	E	E	E
Approach Vol, veh/h		1024			1700			1845			1610	
Approach Delay, s/veh		48.5			54.5			43.6			67.5	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	30.6	34.0	38.4	12.0	35.6	14.7	57.7
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	13.0	20.0	30.0	37.0	8.0	25.0	16.0	51.0
Max Q Clear Time (g_c+I1), s	13.6	26.6	32.0	27.5	9.8	27.8	10.7	13.4
Green Ext Time (p_c), s	0.0	0.0	0.0	4.9	0.0	0.0	0.1	7.3

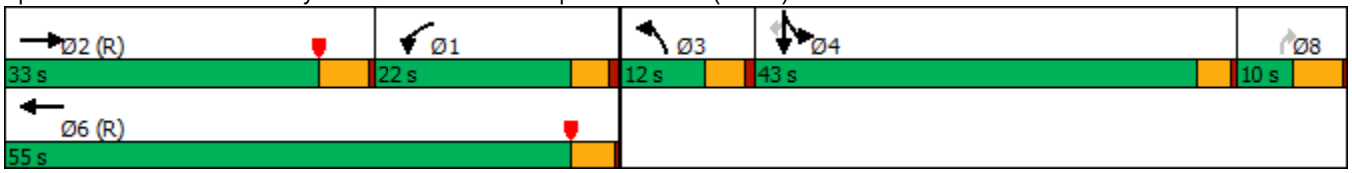
Intersection Summary	
HCM 2010 Ctrl Delay	53.7
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	412	115	815	35	18	714	164	102
Future Volume (vph)	412	115	815	35	18	714	164	102
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	33.0	22.0	55.0	12.0	10.0	43.0	43.0	43.0
Total Split (%)	27.5%	18.3%	45.8%	10.0%	8.3%	35.8%	35.8%	35.8%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lead	Lag		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	29.4	26.8	61.2	7.0	5.0	33.6	33.6	33.6
Actuated g/C Ratio	0.24	0.22	0.51	0.06	0.04	0.28	0.28	0.28
v/c Ratio	0.54	0.31	0.46	0.37	0.10	0.79	0.32	0.19
Control Delay	42.6	34.9	14.2	64.8	1.0	46.4	34.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	34.9	14.2	64.8	1.0	46.4	34.8	2.4
LOS	D	C	B	E	A	D	C	A
Approach Delay	42.6		16.8				39.9	
Approach LOS	D		B				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 74 (62%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 31.6	Intersection LOS: C
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	412	50	115	815	0	35	0	18	714	164	102
Future Volume (veh/h)	0	412	50	115	815	0	35	0	18	714	164	102
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0	1800	0	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	425	52	119	840	0	36	0	19	736	169	105
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	503	61	824	2446	0	0	0	0	850	486	413
Arrive On Green	0.00	0.16	0.16	0.96	1.00	0.00	0.00	0.00	0.00	0.26	0.26	0.26
Sat Flow, veh/h	0	3336	394	1714	3705	0		0		3326	1900	1615
Grp Volume(v), veh/h	0	236	241	119	840	0		0.0		736	169	105
Grp Sat Flow(s),veh/h/ln	0	1805	1830	1714	1805	0				1663	1900	1615
Q Serve(g_s), s	0.0	15.2	15.4	0.4	0.0	0.0				25.4	8.7	6.2
Cycle Q Clear(g_c), s	0.0	15.2	15.4	0.4	0.0	0.0				25.4	8.7	6.2
Prop In Lane	0.00		0.22	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	280	284	824	2446	0				850	486	413
V/C Ratio(X)	0.00	0.84	0.85	0.14	0.34	0.00				0.87	0.35	0.25
Avail Cap(c_a), veh/h	0	421	427	824	2446	0				1095	625	532
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	49.3	49.3	1.2	0.0	0.0				42.7	36.5	35.5
Incr Delay (d2), s/veh	0.0	25.3	26.0	0.1	0.4	0.0				6.0	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.6	9.8	0.2	0.1	0.0				12.4	4.7	2.8
LnGrp Delay(d),s/veh	0.0	74.6	75.3	1.3	0.4	0.0				48.7	36.9	35.9
LnGrp LOS		E	E	A	A					D	D	D
Approach Vol, veh/h		477			959						1010	
Approach Delay, s/veh		74.9			0.5						45.4	
Approach LOS		E			A						D	

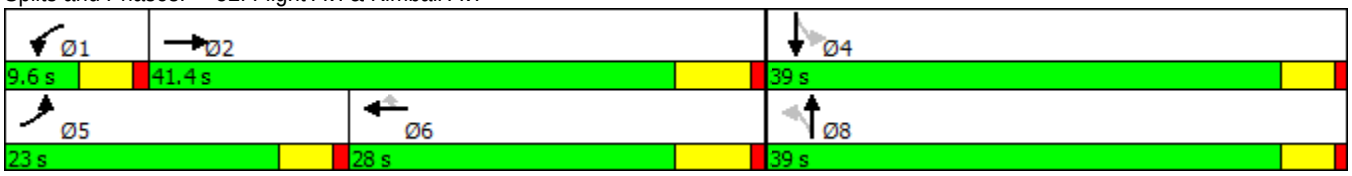
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	62.2	23.6		34.2		85.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		4.5		
Max Green Setting (Gmax), s	17.5	28.0		39.5		50.5		
Max Q Clear Time (g_c+I1), s	2.4	17.4		27.4		2.0		
Green Ext Time (p_c), s	0.2	1.2		3.3		4.9		

Intersection Summary	
HCM 2010 Ctrl Delay	33.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	281	856	22	704	14	84	16	127	25
Future Volume (vph)	281	856	22	704	14	84	16	127	25
Turn Type	Prot	NA	Prot	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	24.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	41.4	9.6	28.0	28.0	39.0	39.0	39.0	39.0
Total Split (%)	25.6%	46.0%	10.7%	31.1%	31.1%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	17.4	39.1	5.0	20.9	20.9		34.5		34.5
Actuated g/C Ratio	0.20	0.44	0.06	0.24	0.24		0.39		0.39
v/c Ratio	0.89	0.64	0.24	0.88	0.03		0.36		0.97
Control Delay	63.6	22.2	46.9	45.4	0.1		23.6		60.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	63.6	22.2	46.9	45.4	0.1		23.6		60.1
LOS	E	C	D	D	A		C		E
Approach Delay		31.7		44.6			23.6		60.1
Approach LOS		C		D			C		E

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 88.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 40.7	Intersection LOS: D
Intersection Capacity Utilization 80.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	856	93	22	704	14	84	16	22	127	25	384
Future Volume (veh/h)	281	856	93	22	704	14	84	16	22	127	25	384
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	299	911	99	23	749	15	89	17	23	135	27	409
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	334	1361	148	42	888	397	255	51	51	182	45	440
Arrive On Green	0.19	0.42	0.42	0.02	0.25	0.25	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1714	3274	356	1714	3610	1615	485	135	134	342	118	1161
Grp Volume(v), veh/h	299	502	508	23	749	15	129	0	0	571	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1825	1714	1805	1615	754	0	0	1621	0	0
Q Serve(g_s), s	14.5	19.2	19.2	1.1	16.8	0.6	0.0	0.0	0.0	17.8	0.0	0.0
Cycle Q Clear(g_c), s	14.5	19.2	19.2	1.1	16.8	0.6	10.8	0.0	0.0	28.6	0.0	0.0
Prop In Lane	1.00		0.19	1.00		1.00	0.69		0.18	0.24		0.72
Lane Grp Cap(c), veh/h	334	751	759	42	888	397	357	0	0	666	0	0
V/C Ratio(X)	0.90	0.67	0.67	0.54	0.84	0.04	0.36	0.00	0.00	0.86	0.00	0.00
Avail Cap(c_a), veh/h	371	751	759	101	925	414	387	0	0	706	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.4	20.1	20.1	41.0	30.5	24.4	19.3	0.0	0.0	25.0	0.0	0.0
Incr Delay (d2), s/veh	20.8	2.3	2.3	4.0	7.0	0.0	0.6	0.0	0.0	9.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	10.0	10.1	0.6	9.2	0.3	2.3	0.0	0.0	14.5	0.0	0.0
LnGrp Delay(d),s/veh	54.2	22.4	22.4	45.0	37.5	24.5	19.9	0.0	0.0	34.9	0.0	0.0
LnGrp LOS	D	C	C	D	D	C	B			C		
Approach Vol, veh/h		1309			787			129			571	
Approach Delay, s/veh		29.7			37.5			19.9			34.9	
Approach LOS		C			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	41.6		36.8	21.2	27.1		36.8
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	35.2		34.4	18.4	21.8		34.4
Max Q Clear Time (g_c+I1), s	3.1	21.2		30.6	16.5	18.8		12.8
Green Ext Time (p_c), s	0.0	8.6		1.7	0.1	2.1		4.9

Intersection Summary	
HCM 2010 Ctrl Delay	32.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	281	1106	22	1012	116	84	16	377	25
Future Volume (vph)	281	1106	22	1012	116	84	16	377	25
Turn Type	Prot	NA	Prot	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	24.2	31.6	31.6	31.6	31.6
Total Split (s)	28.0	64.0	10.5	46.5	46.5	45.5	45.5	45.5	45.5
Total Split (%)	23.3%	53.3%	8.8%	38.8%	38.8%	37.9%	37.9%	37.9%	37.9%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2		4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 115.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	1106	93	22	1012	116	84	16	22	377	25	384
Future Volume (veh/h)	281	1106	93	22	1012	116	84	16	22	377	25	384
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	299	1177	99	23	1077	123	89	17	23	401	27	409
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	324	1675	141	39	1197	536	135	28	24	495	34	522
Arrive On Green	0.19	0.50	0.50	0.02	0.33	0.33	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1714	3363	282	1714	3610	1615	240	79	69	1389	99	1499
Grp Volume(v), veh/h	299	631	645	23	1077	123	129	0	0	401	0	436
Grp Sat Flow(s),veh/h/ln	1714	1805	1841	1714	1805	1615	389	0	0	1389	0	1598
Q Serve(g_s), s	20.1	31.7	31.8	1.6	33.4	6.5	11.5	0.0	0.0	0.0	0.0	28.7
Cycle Q Clear(g_c), s	20.1	31.7	31.8	1.6	33.4	6.5	40.2	0.0	0.0	36.5	0.0	28.7
Prop In Lane	1.00		0.15	1.00		1.00	0.69		0.18	1.00		0.94
Lane Grp Cap(c), veh/h	324	899	917	39	1197	536	187	0	0	495	0	556
V/C Ratio(X)	0.92	0.70	0.70	0.60	0.90	0.23	0.69	0.00	0.00	0.81	0.00	0.78
Avail Cap(c_a), veh/h	342	899	917	86	1239	554	187	0	0	495	0	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.8	22.7	22.8	56.9	37.4	28.4	48.6	0.0	0.0	36.8	0.0	34.3
Incr Delay (d2), s/veh	28.3	2.5	2.5	5.4	8.9	0.2	10.2	0.0	0.0	9.8	0.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.1	16.4	16.8	0.8	18.1	2.9	4.7	0.0	0.0	13.8	0.0	13.7
LnGrp Delay(d),s/veh	75.1	25.2	25.2	62.3	46.3	28.6	58.8	0.0	0.0	46.6	0.0	41.5
LnGrp LOS	E	C	C	E	D	C	E			D		D
Approach Vol, veh/h		1575			1223			129			837	
Approach Delay, s/veh		34.7			44.8			58.8			44.0	
Approach LOS		C			D			E			D	

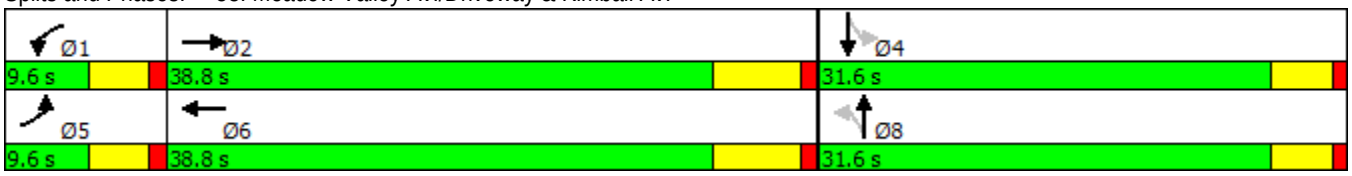
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	64.7		45.5	26.8	45.1		45.5
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.9	57.8		40.9	23.4	40.3		40.9
Max Q Clear Time (g_c+I1), s	3.6	33.8		38.5	22.1	35.4		42.2
Green Ext Time (p_c), s	0.0	16.8		1.2	0.1	3.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	40.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	927	23	640	29	0	11	0
Future Volume (vph)	30	927	23	640	29	0	11	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	31.6	31.6	31.6	31.6
Total Split (s)	9.6	38.8	9.6	38.8	31.6	31.6	31.6	31.6
Total Split (%)	12.0%	48.5%	12.0%	48.5%	39.5%	39.5%	39.5%	39.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.5	22.5	5.5	22.5		13.1		13.1
Actuated g/C Ratio	0.11	0.45	0.11	0.45		0.26		0.26
v/c Ratio	0.18	0.69	0.14	0.45		0.11		0.18
Control Delay	30.7	15.1	30.4	11.9		0.8		4.5
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	30.7	15.1	30.4	11.9		0.8		4.5
LOS	C	B	C	B		A		A
Approach Delay		15.6		12.5		0.8		4.5
Approach LOS		B		B		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 50.4	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 44.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 53: Meadow Valley Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	927	47	23	640	2	29	0	15	11	0	71
Future Volume (veh/h)	30	927	47	23	640	2	29	0	15	11	0	71
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	33	1053	53	26	727	2	33	0	17	12	0	77
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.88	0.88	0.88	0.88	0.92	0.88	0.92	0.88	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	1645	83	52	1716	5	295	24	104	99	24	276
Arrive On Green	0.04	0.47	0.47	0.03	0.46	0.46	0.20	0.00	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1714	3493	176	1714	3693	10	907	121	530	96	123	1407
Grp Volume(v), veh/h	33	544	562	26	355	374	50	0	0	89	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1864	1714	1805	1898	1558	0	0	1626	0	0
Q Serve(g_s), s	1.0	11.6	11.6	0.8	6.7	6.7	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	11.6	11.6	0.8	6.7	6.7	1.2	0.0	0.0	2.3	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.01	0.66		0.34	0.13		0.87
Lane Grp Cap(c), veh/h	63	850	878	52	839	882	423	0	0	399	0	0
V/C Ratio(X)	0.53	0.64	0.64	0.50	0.42	0.42	0.12	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	168	1155	1193	168	1155	1215	917	0	0	933	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.1	10.2	10.2	24.3	9.1	9.1	16.9	0.0	0.0	17.4	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.8	0.8	2.8	0.3	0.3	0.1	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.9	6.1	0.4	3.3	3.5	0.6	0.0	0.0	1.1	0.0	0.0
LnGrp Delay(d),s/veh	26.6	11.0	11.0	27.1	9.4	9.4	17.0	0.0	0.0	17.7	0.0	0.0
LnGrp LOS	C	B	B	C	A	A	B			B		
Approach Vol, veh/h		1139			755			50			89	
Approach Delay, s/veh		11.4			10.0			17.0			17.7	
Approach LOS		B			B			B			B	

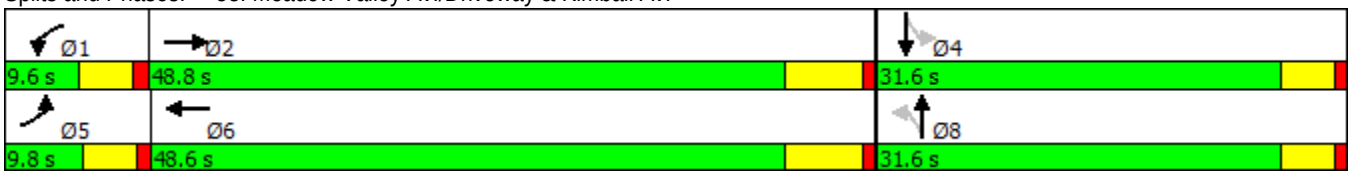
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	30.2		14.6	6.5	29.9		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	32.6		27.0	5.0	32.6		27.0
Max Q Clear Time (g_c+I1), s	2.8	13.6		4.3	3.0	8.7		3.2
Green Ext Time (p_c), s	0.0	10.4		0.8	0.0	11.8		0.8

Intersection Summary		
HCM 2010 Ctrl Delay		11.3
HCM 2010 LOS		B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	1427	23	1050	29	0	11	0
Future Volume (vph)	30	1427	23	1050	29	0	11	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	31.6	31.6	31.6	31.6
Total Split (s)	9.8	48.8	9.6	48.6	31.6	31.6	31.6	31.6
Total Split (%)	10.9%	54.2%	10.7%	54.0%	35.1%	35.1%	35.1%	35.1%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.3	41.3	5.1	41.2		12.9		12.9
Actuated g/C Ratio	0.08	0.60	0.07	0.60		0.19		0.19
v/c Ratio	0.25	0.78	0.20	0.55		0.14		0.23
Control Delay	40.0	16.1	39.2	11.3		1.9		7.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	40.0	16.1	39.2	11.3		1.9		7.1
LOS	D	B	D	B		A		A
Approach Delay		16.5		11.9		1.9		7.1
Approach LOS		B		B		A		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 53: Meadow Valley Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1427	47	23	1050	2	29	0	15	11	0	71
Future Volume (veh/h)	30	1427	47	23	1050	2	29	0	15	11	0	71
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	33	1622	53	26	1193	2	33	0	17	12	0	77
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.88	0.88	0.88	0.88	0.92	0.88	0.92	0.88	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	59	2114	69	49	2172	4	227	18	81	76	17	209
Arrive On Green	0.03	0.59	0.59	0.03	0.59	0.59	0.15	0.00	0.15	0.15	0.00	0.15
Sat Flow, veh/h	1714	3565	116	1714	3698	6	929	121	541	104	114	1405
Grp Volume(v), veh/h	33	819	856	26	582	613	50	0	0	89	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1876	1714	1805	1899	1592	0	0	1624	0	0
Q Serve(g_s), s	1.3	22.7	22.9	1.0	13.2	13.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	22.7	22.9	1.0	13.2	13.2	1.6	0.0	0.0	3.3	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.00	0.66		0.34	0.13		0.87
Lane Grp Cap(c), veh/h	59	1071	1113	49	1060	1116	326	0	0	303	0	0
V/C Ratio(X)	0.56	0.76	0.77	0.53	0.55	0.55	0.15	0.00	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	133	1145	1190	128	1140	1199	701	0	0	707	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.9	10.2	10.2	32.2	8.4	8.4	25.0	0.0	0.0	25.7	0.0	0.0
Incr Delay (d2), s/veh	3.1	2.9	2.9	3.3	0.5	0.5	0.2	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	12.0	12.6	0.5	6.6	6.9	0.8	0.0	0.0	1.5	0.0	0.0
LnGrp Delay(d),s/veh	35.0	13.1	13.2	35.4	8.9	8.9	25.2	0.0	0.0	26.2	0.0	0.0
LnGrp LOS	D	B	B	D	A	A	C			C		
Approach Vol, veh/h		1708			1221			50			89	
Approach Delay, s/veh		13.6			9.5			25.2			26.2	
Approach LOS		B			A			C			C	

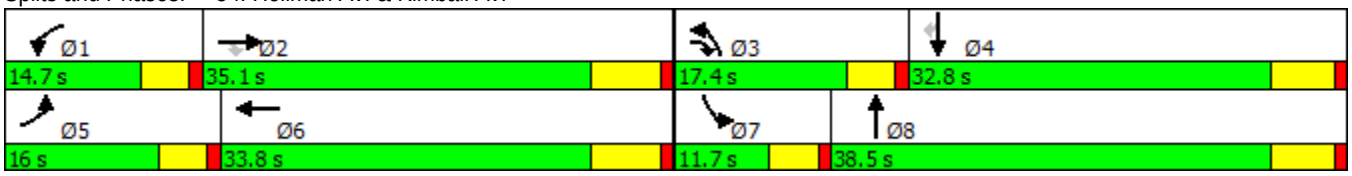
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.5	46.0		14.6	6.9	45.6		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	42.6		27.0	5.2	42.4		27.0
Max Q Clear Time (g_c+I1), s	3.0	24.9		5.3	3.3	15.2		3.6
Green Ext Time (p_c), s	0.0	14.9		0.8	0.0	21.3		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	12.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	186	299	469	110	341	201	175	43	367	124
Future Volume (vph)	186	299	469	110	341	201	175	43	367	124
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	3	1	6	3	8	7	4	
Permitted Phases			2							4
Detector Phase	5	2	3	1	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	9.6	33.2	9.6	32.8	9.6	32.8	32.8
Total Split (s)	16.0	35.1	17.4	14.7	33.8	17.4	38.5	11.7	32.8	32.8
Total Split (%)	16.0%	35.1%	17.4%	14.7%	33.8%	17.4%	38.5%	11.7%	32.8%	32.8%
Yellow Time (s)	3.6	5.2	3.6	3.6	5.2	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	4.6	6.2	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	11.6	24.9	39.6	9.0	22.4	13.0	27.1	6.3	15.9	15.9
Actuated g/C Ratio	0.14	0.30	0.47	0.11	0.27	0.15	0.32	0.07	0.19	0.19
v/c Ratio	0.85	0.57	0.60	0.64	0.81	0.82	0.29	0.36	0.58	0.30
Control Delay	71.1	31.0	12.6	56.1	43.4	63.3	13.5	48.9	35.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.1	31.0	12.6	56.1	43.4	63.3	13.5	48.9	35.0	3.2
LOS	E	C	B	E	D	E	B	D	C	A
Approach Delay		29.8			46.3		32.6		28.7	
Approach LOS		C			D		C		C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 84.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 33.4	Intersection LOS: C
Intersection Capacity Utilization 70.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	299	469	110	341	37	201	175	148	43	367	124
Future Volume (veh/h)	186	299	469	110	341	37	201	175	148	43	367	124
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	200	322	504	118	367	40	216	188	159	46	395	133
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	235	621	758	148	465	51	252	547	437	68	648	285
Arrive On Green	0.14	0.33	0.33	0.09	0.28	0.28	0.15	0.29	0.29	0.04	0.18	0.18
Sat Flow, veh/h	1714	1900	1592	1714	1684	184	1714	1910	1526	1714	3610	1590
Grp Volume(v), veh/h	200	322	504	118	0	407	216	177	170	46	395	133
Grp Sat Flow(s),veh/h/ln	1714	1900	1592	1714	0	1868	1714	1805	1631	1714	1805	1590
Q Serve(g_s), s	9.3	11.2	19.8	5.5	0.0	16.4	10.0	6.3	6.7	2.2	8.2	6.1
Cycle Q Clear(g_c), s	9.3	11.2	19.8	5.5	0.0	16.4	10.0	6.3	6.7	2.2	8.2	6.1
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	235	621	758	148	0	515	252	517	467	68	648	285
V/C Ratio(X)	0.85	0.52	0.67	0.80	0.00	0.79	0.86	0.34	0.36	0.68	0.61	0.47
Avail Cap(c_a), veh/h	240	675	803	213	0	634	270	726	656	150	1199	528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	22.2	16.5	36.5	0.0	27.3	33.9	22.9	23.1	38.5	30.7	29.9
Incr Delay (d2), s/veh	22.6	0.7	1.9	8.0	0.0	5.4	20.7	0.4	0.5	4.3	0.9	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	5.9	9.1	2.9	0.0	9.3	6.2	3.2	3.1	1.1	4.1	2.8
LnGrp Delay(d),s/veh	56.9	22.8	18.4	44.5	0.0	32.7	54.6	23.3	23.6	42.8	31.7	31.1
LnGrp LOS	E	C	B	D		C	D	C	C	D	C	C
Approach Vol, veh/h		1026			525			563			574	
Approach Delay, s/veh		27.3			35.4			35.4			32.4	
Approach LOS		C			D			D			C	

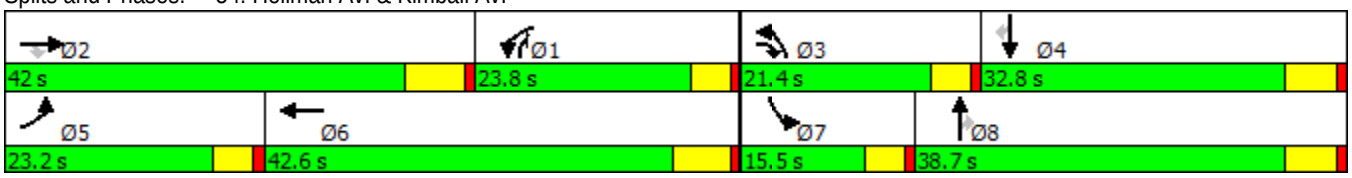
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.6	32.8	16.5	20.4	15.7	28.6	7.8	29.1
Change Period (Y+Rc), s	4.6	6.2	4.6	5.8	4.6	6.2	4.6	5.8
Max Green Setting (Gmax), s	10.1	28.9	12.8	27.0	11.4	27.6	7.1	32.7
Max Q Clear Time (g_c+I1), s	7.5	21.8	12.0	10.2	11.3	18.4	4.2	8.7
Green Ext Time (p_c), s	0.0	3.4	0.0	4.4	0.0	4.0	0.0	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	186	999	269	503	751	201	175	448	43	367	124
Future Volume (vph)	186	999	269	503	751	201	175	448	43	367	124
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2	3	1	6	3	8	1	7	4	
Permitted Phases			2					8			4
Detector Phase	5	2	3	1	6	3	8	1	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	9.6	33.2	9.6	32.8	9.6	9.6	32.8	32.8
Total Split (s)	23.2	42.0	21.4	23.8	42.6	21.4	38.7	23.8	15.5	32.8	32.8
Total Split (%)	19.3%	35.0%	17.8%	19.8%	35.5%	17.8%	32.3%	19.8%	12.9%	27.3%	27.3%
Yellow Time (s)	3.6	5.2	3.6	3.6	5.2	3.6	4.8	3.6	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	4.6	6.2	4.6	5.8	4.6	4.6	5.8	5.8
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min	Min
Act Effct Green (s)	16.0	35.9	53.7	19.2	39.1	16.2	29.0	50.4	7.5	18.2	18.2
Actuated g/C Ratio	0.14	0.32	0.48	0.17	0.35	0.15	0.26	0.45	0.07	0.16	0.16
v/c Ratio	0.81	0.92	0.35	0.94	0.67	0.86	0.20	0.59	0.40	0.66	0.30
Control Delay	71.0	50.1	7.9	71.6	34.9	78.5	33.5	13.5	60.7	49.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.0	50.1	7.9	71.6	34.9	78.5	33.5	13.5	60.7	49.1	2.0
LOS	E	D	A	E	C	E	C	B	E	D	A
Approach Delay		45.0			49.2		33.6			39.1	
Approach LOS		D			D		C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 110.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 43.2	Intersection LOS: D
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	999	269	503	751	37	201	175	448	43	367	124
Future Volume (veh/h)	186	999	269	503	751	37	201	175	448	43	367	124
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	200	1074	289	541	808	40	216	188	482	46	395	133
Adj No. of Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	228	1145	734	573	1298	64	243	983	718	58	594	261
Arrive On Green	0.13	0.32	0.32	0.17	0.37	0.37	0.14	0.27	0.27	0.03	0.16	0.16
Sat Flow, veh/h	1714	3610	1592	3326	3501	173	1714	3610	1615	1714	3610	1589
Grp Volume(v), veh/h	200	1074	289	541	417	431	216	188	482	46	395	133
Grp Sat Flow(s),veh/h/ln	1714	1805	1592	1663	1805	1869	1714	1805	1615	1714	1805	1589
Q Serve(g_s), s	12.8	32.2	5.4	17.9	21.1	21.1	13.8	4.5	3.6	3.0	11.4	8.5
Cycle Q Clear(g_c), s	12.8	32.2	5.4	17.9	21.1	21.1	13.8	4.5	3.6	3.0	11.4	8.5
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	1145	734	573	669	693	243	983	718	58	594	261
V/C Ratio(X)	0.88	0.94	0.39	0.94	0.62	0.62	0.89	0.19	0.67	0.79	0.67	0.51
Avail Cap(c_a), veh/h	286	1159	740	573	669	693	258	1065	755	168	874	385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	37.0	6.7	45.6	28.7	28.7	47.0	31.2	11.5	53.4	43.7	42.5
Incr Delay (d2), s/veh	18.8	14.1	0.3	24.4	1.8	1.7	26.9	0.1	2.2	8.4	1.3	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	18.3	2.8	10.2	10.7	11.1	8.4	2.2	8.2	1.5	5.8	3.8
LnGrp Delay(d),s/veh	66.2	51.1	7.1	70.0	30.5	30.4	73.9	31.2	13.7	61.9	45.0	44.0
LnGrp LOS	E	D	A	E	C	C	E	C	B	E	D	D
Approach Vol, veh/h		1563			1389			886			574	
Approach Delay, s/veh		44.9			45.9			32.1			46.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.4	41.6	20.4	24.1	19.4	47.5	8.4	36.1
Change Period (Y+Rc), s	6.2	* 6.2	4.6	5.8	4.6	6.2	4.6	5.8
Max Green Setting (Gmax), s	19.2	* 36	16.8	27.0	18.6	36.4	10.9	32.9
Max Q Clear Time (g_c+I1), s	19.9	34.2	15.8	13.4	14.8	23.1	5.0	6.5
Green Ext Time (p_c), s	0.0	1.1	0.0	4.9	0.1	4.8	0.0	6.2

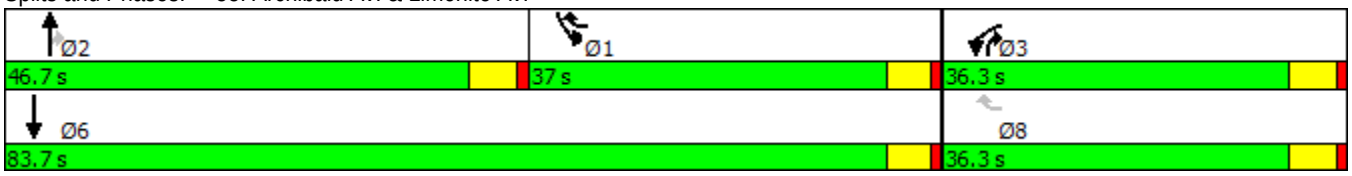
Intersection Summary	
HCM 2010 Ctrl Delay	42.8
HCM 2010 LOS	D

Notes

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	744	875	1439	730	1052	1978	
Future Volume (vph)	744	875	1439	730	1052	1978	
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA	
Protected Phases	3	1	2	3	1	6	8
Permitted Phases		8		2			
Detector Phase	3	1	2	3	1	6	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0	36.3
Total Split (s)	36.3	37.0	46.7	36.3	37.0	83.7	36.3
Total Split (%)	30.3%	30.8%	38.9%	30.3%	30.8%	69.8%	30%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0	
Lead/Lag		Lag	Lead		Lag		
Lead-Lag Optimize?		Yes	Yes		Yes		
Recall Mode	None	None	Min	None	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 119.7
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	744	0	875	0	1439	730	1052	1978	0
Future Volume (veh/h)	0	0	0	744	0	875	0	1439	730	1052	1978	0
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	0	1900	0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h				836	0	941	0	1617	820	1182	2222	0
Adj No. of Lanes				2	0	2	0	3	1	2	3	0
Peak Hour Factor				0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				894	0	1489	0	1790	969	944	3416	0
Arrive On Green				0.25	0.00	0.25	0.00	0.35	0.35	0.27	0.66	0.00
Sat Flow, veh/h				3510	0	2842	0	5358	1615	3510	5358	0
Grp Volume(v), veh/h				836	0	941	0	1617	820	1182	2222	0
Grp Sat Flow(s),veh/h/ln				1755	0	1421	0	1729	1615	1755	1729	0
Q Serve(g_s), s				27.7	0.0	0.0	0.0	35.3	7.9	32.0	30.4	0.0
Cycle Q Clear(g_c), s				27.7	0.0	0.0	0.0	35.3	7.9	32.0	30.4	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h				894	0	1489	0	1790	969	944	3416	0
V/C Ratio(X)				0.93	0.00	0.63	0.00	0.90	0.85	1.25	0.65	0.00
Avail Cap(c_a), veh/h				915	0	1505	0	1805	973	944	3431	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				43.4	0.0	20.2	0.0	37.1	11.7	43.5	12.1	0.0
Incr Delay (d2), s/veh				15.8	0.0	0.6	0.0	6.9	7.1	122.1	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.4	0.0	11.0	0.0	17.9	5.0	31.5	14.5	0.0
LnGrp Delay(d),s/veh				59.1	0.0	20.8	0.0	43.9	18.8	165.6	12.5	0.0
LnGrp LOS				E		C		D	B	F	B	
Approach Vol, veh/h					1777			2437			3404	
Approach Delay, s/veh					38.8			35.5			65.6	
Approach LOS					D			D			E	

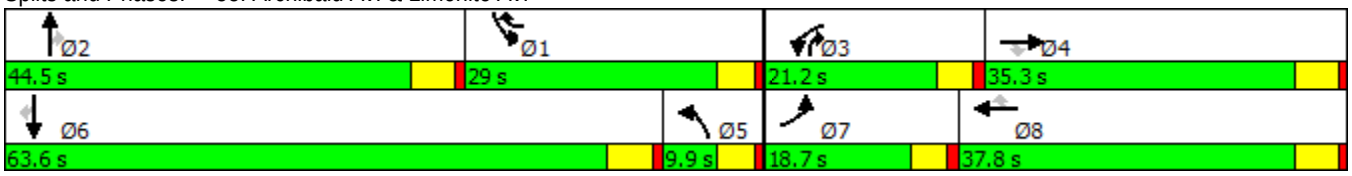
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	37.0	46.4				83.4		35.6
Change Period (Y+Rc), s	5.0	5.3				5.0		5.3
Max Green Setting (Gmax), s	32.0	41.4				78.7		31.0
Max Q Clear Time (g_c+I1), s	34.0	37.3				32.4		29.7
Green Ext Time (p_c), s	0.0	3.8				29.1		0.6

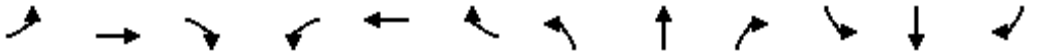
Intersection Summary	
HCM 2010 Ctrl Delay	49.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	699	108	444	601	1176	82	1439	380	703	1978	237
Future Volume (vph)	285	699	108	444	601	1176	82	1439	380	703	1978	237
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0	6.0
Minimum Split (s)	9.6	35.3	35.3	9.6	35.3	9.6	9.6	43.3	9.6	9.6	43.3	43.3
Total Split (s)	18.7	35.3	35.3	21.2	37.8	29.0	9.9	44.5	21.2	29.0	63.6	63.6
Total Split (%)	14.4%	27.2%	27.2%	16.3%	29.1%	22.3%	7.6%	34.2%	16.3%	22.3%	48.9%	48.9%
Yellow Time (s)	3.6	4.3	4.3	3.6	4.3	3.6	3.6	4.3	3.6	3.6	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.3	5.3	4.6	5.3	4.6	4.6	5.3	4.6	4.6	5.3	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 128.7
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	699	108	444	601	1176	82	1439	380	703	1978	237
Future Volume (veh/h)	285	699	108	444	601	1176	82	1439	380	703	1978	237
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1976	1976	1976	1976	1976	1976	1900	1976	1900	1976	1976	1900
Adj Flow Rate, veh/h	310	760	63	483	653	735	89	1564	250	764	2150	149
Adj No. of Lanes	2	2	1	2	2	2	2	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	364	843	377	470	953	1489	168	1638	698	713	2401	719
Arrive On Green	0.10	0.22	0.22	0.13	0.25	0.25	0.05	0.30	0.30	0.19	0.45	0.45
Sat Flow, veh/h	3651	3754	1680	3651	3754	3359	3510	5394	1615	3764	5394	1615
Grp Volume(v), veh/h	310	760	63	483	653	735	89	1564	250	764	2150	149
Grp Sat Flow(s),veh/h/ln	1825	1877	1680	1825	1877	1680	1755	1798	1615	1882	1798	1615
Q Serve(g_s), s	10.8	25.4	3.3	16.6	20.2	4.9	3.2	36.6	6.3	24.4	47.4	5.0
Cycle Q Clear(g_c), s	10.8	25.4	3.3	16.6	20.2	4.9	3.2	36.6	6.3	24.4	47.4	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	364	843	377	470	953	1489	168	1638	698	713	2401	719
V/C Ratio(X)	0.85	0.90	0.17	1.03	0.69	0.49	0.53	0.95	0.36	1.07	0.90	0.21
Avail Cap(c_a), veh/h	399	874	391	470	953	1489	168	1641	699	713	2440	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.1	48.6	28.4	56.1	43.4	11.3	59.9	44.0	9.2	52.2	33.0	10.2
Incr Delay (d2), s/veh	13.9	11.7	0.1	48.6	1.7	0.1	1.6	13.1	0.4	54.8	4.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	14.6	1.7	11.5	10.7	5.7	1.6	20.2	3.1	18.0	24.6	2.9
LnGrp Delay(d),s/veh	71.0	60.3	28.4	104.8	45.1	11.4	61.6	57.1	9.6	107.0	37.8	10.3
LnGrp LOS	E	E	C	F	D	B	E	E	A	F	D	B
Approach Vol, veh/h		1133			1871			1903			3063	
Approach Delay, s/veh		61.5			47.3			51.1			53.7	
Approach LOS		E			D			D			D	

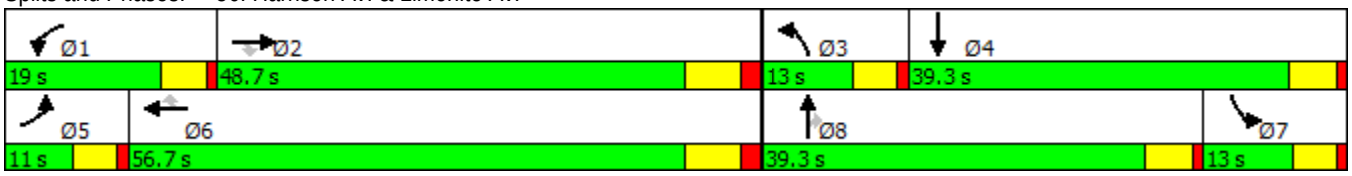
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.0	44.4	21.2	34.3	10.8	62.7	17.4	38.0
Change Period (Y+Rc), s	4.6	5.3	4.6	5.3	4.6	5.3	4.6	5.3
Max Green Setting (Gmax), s	24.4	39.2	16.6	30.0	5.3	58.3	14.1	32.5
Max Q Clear Time (g_c+I1), s	26.4	38.6	18.6	27.4	5.2	49.4	12.8	22.2
Green Ext Time (p_c), s	0.0	0.5	0.0	1.6	0.0	8.0	0.1	5.7

Intersection Summary	
HCM 2010 Ctrl Delay	52.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	78	1894	210	251	1942	93	135	58	157	109	109
Future Volume (vph)	78	1894	210	251	1942	93	135	58	157	109	109
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	11.0	48.7	48.7	19.0	56.7	56.7	13.0	39.3	39.3	13.0	39.3
Total Split (%)	9.2%	40.6%	40.6%	15.8%	47.3%	47.3%	10.8%	32.8%	32.8%	10.8%	32.8%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 106.7
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1894	210	251	1942	93	135	58	157	109	109	144
Future Volume (veh/h)	78	1894	210	251	1942	93	135	58	157	109	109	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	2104	232	279	2158	103	150	64	145	121	121	153
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	103	2055	626	241	2449	762	138	178	149	294	139	175
Arrive On Green	0.06	0.40	0.40	0.13	0.47	0.47	0.08	0.09	0.09	0.16	0.18	0.18
Sat Flow, veh/h	1810	5187	1581	1810	5187	1615	1810	1900	1588	1810	758	958
Grp Volume(v), veh/h	87	2104	232	279	2158	103	150	64	145	121	0	274
Grp Sat Flow(s),veh/h/ln	1810	1729	1581	1810	1729	1615	1810	1900	1588	1810	0	1716
Q Serve(g_s), s	5.0	41.7	10.9	14.0	39.6	1.8	8.0	3.3	7.1	6.3	0.0	16.3
Cycle Q Clear(g_c), s	5.0	41.7	10.9	14.0	39.6	1.8	8.0	3.3	7.1	6.3	0.0	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	103	2055	626	241	2449	762	138	178	149	294	0	314
V/C Ratio(X)	0.84	1.02	0.37	1.16	0.88	0.14	1.09	0.36	0.97	0.41	0.00	0.87
Avail Cap(c_a), veh/h	103	2055	626	241	2449	762	138	614	513	294	0	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.2	31.8	22.5	45.6	25.1	3.5	48.6	44.7	26.4	39.6	0.0	41.8
Incr Delay (d2), s/veh	42.0	26.2	0.4	107.9	4.1	0.1	103.1	1.2	28.4	0.3	0.0	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	24.8	4.8	14.2	19.7	1.6	7.9	1.8	5.0	3.2	0.0	8.4
LnGrp Delay(d),s/veh	91.1	58.0	22.9	153.5	29.2	3.6	151.8	46.0	54.8	39.9	0.0	49.3
LnGrp LOS	F	F	C	F	C	A	F	D	D	D		D
Approach Vol, veh/h		2423			2540			359			395	
Approach Delay, s/veh		55.8			41.8			93.8			46.4	
Approach LOS		E			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	48.7	13.0	24.6	11.0	56.7	22.4	15.2
Change Period (Y+Rc), s	5.0	7.0	5.0	5.3	5.0	7.0	5.3	* 5.3
Max Green Setting (Gmax), s	14.0	41.7	8.0	34.0	6.0	49.7	8.0	* 34
Max Q Clear Time (g_c+I1), s	16.0	43.7	10.0	18.3	7.0	41.6	8.3	9.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.0	8.0	0.0	0.7

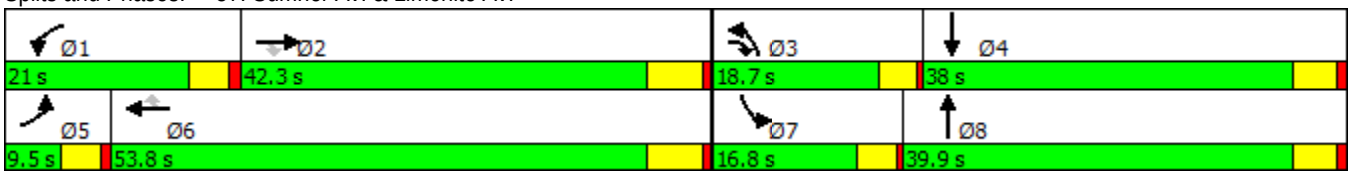
Intersection Summary	
HCM 2010 Ctrl Delay	51.3
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	114	1579	541	489	1868	66	422	79	93	166
Future Volume (vph)	114	1579	541	489	1868	66	422	79	93	166
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	3	1	6		3	8	7	4
Permitted Phases			2			6				
Detector Phase	5	2	3	1	6	6	3	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	9.5	42.3	18.7	21.0	53.8	53.8	18.7	39.9	16.8	38.0
Total Split (%)	7.9%	35.3%	15.6%	17.5%	44.8%	44.8%	15.6%	33.3%	14.0%	31.7%
Yellow Time (s)	3.5	5.0	3.5	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 101
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	1579	541	489	1868	66	422	79	321	93	166	88
Future Volume (veh/h)	114	1579	541	489	1868	66	422	79	321	93	166	88
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	118	1628	552	504	1926	47	435	81	257	96	171	64
Adj No. of Lanes	2	3	1	2	3	1	2	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	1909	823	567	2484	773	499	371	330	122	338	122
Arrive On Green	0.05	0.37	0.37	0.16	0.48	0.48	0.14	0.21	0.21	0.07	0.13	0.13
Sat Flow, veh/h	3510	5187	1612	3510	5187	1614	3510	1805	1608	1810	2588	931
Grp Volume(v), veh/h	118	1628	552	504	1926	47	435	81	257	96	117	118
Grp Sat Flow(s),veh/h/ln	1755	1729	1612	1755	1729	1614	1755	1805	1608	1810	1805	1714
Q Serve(g_s), s	3.3	28.5	25.2	13.9	30.4	1.5	12.0	3.7	14.9	5.2	6.0	6.3
Cycle Q Clear(g_c), s	3.3	28.5	25.2	13.9	30.4	1.5	12.0	3.7	14.9	5.2	6.0	6.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.54
Lane Grp Cap(c), veh/h	178	1909	823	567	2484	773	499	371	330	122	236	224
V/C Ratio(X)	0.66	0.85	0.67	0.89	0.78	0.06	0.87	0.22	0.78	0.79	0.50	0.53
Avail Cap(c_a), veh/h	178	1909	823	587	2512	782	523	638	569	235	603	573
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	28.7	18.0	40.5	21.3	13.8	41.5	32.6	37.1	45.3	39.9	40.0
Incr Delay (d2), s/veh	7.3	4.0	2.1	14.6	1.6	0.0	13.7	0.2	3.0	4.1	1.2	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	14.3	11.6	7.9	14.8	0.7	6.7	1.9	6.9	2.7	3.0	3.1
LnGrp Delay(d),s/veh	53.3	32.7	20.1	55.1	22.9	13.8	55.1	32.8	40.1	49.5	41.1	41.5
LnGrp LOS	D	C	C	E	C	B	E	C	D	D	D	D
Approach Vol, veh/h		2298			2477			773			331	
Approach Delay, s/veh		30.7			29.3			47.8			43.6	
Approach LOS		C			C			D			D	

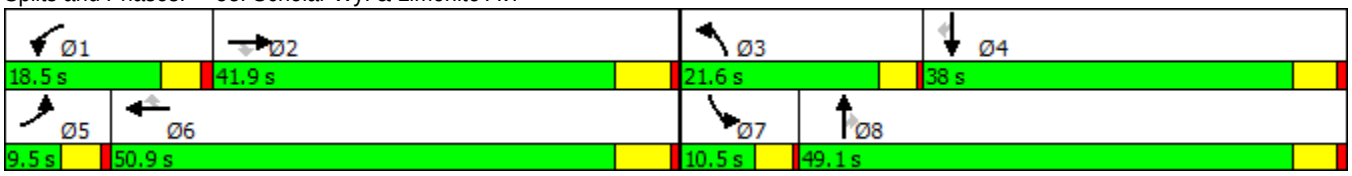
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.4	42.3	18.0	17.9	9.5	53.3	10.7	25.3
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	16.5	36.3	14.7	33.0	5.0	47.8	12.8	34.9
Max Q Clear Time (g_c+I1), s	15.9	30.5	14.0	8.3	5.3	32.4	7.2	16.9
Green Ext Time (p_c), s	0.1	5.7	0.1	2.6	0.0	14.9	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.1
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1528	197	214	2053	47	271	34	186	34	95	66
Future Volume (vph)	65	1528	197	214	2053	47	271	34	186	34	95	66
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	9.5	41.9	41.9	18.5	50.9	50.9	21.6	49.1	49.1	10.5	38.0	38.0
Total Split (%)	7.9%	34.9%	34.9%	15.4%	42.4%	42.4%	18.0%	40.9%	40.9%	8.8%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 99.2
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1528	197	214	2053	47	271	34	186	34	95	66
Future Volume (veh/h)	65	1528	197	214	2053	47	271	34	186	34	95	66
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	1559	199	218	2095	48	277	35	142	35	97	64
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	85	2050	629	252	2529	769	311	429	364	47	286	126
Arrive On Green	0.05	0.40	0.40	0.14	0.49	0.49	0.17	0.23	0.23	0.03	0.08	0.08
Sat Flow, veh/h	1810	5187	1591	1810	5187	1577	1810	1900	1613	1810	3610	1585
Grp Volume(v), veh/h	66	1559	199	218	2095	48	277	35	142	35	97	64
Grp Sat Flow(s),veh/h/ln	1810	1729	1591	1810	1729	1577	1810	1900	1613	1810	1805	1585
Q Serve(g_s), s	3.3	23.7	7.9	10.7	31.7	1.5	13.6	1.3	6.8	1.8	2.3	3.5
Cycle Q Clear(g_c), s	3.3	23.7	7.9	10.7	31.7	1.5	13.6	1.3	6.8	1.8	2.3	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	2050	629	252	2529	769	311	429	364	47	286	126
V/C Ratio(X)	0.77	0.76	0.32	0.86	0.83	0.06	0.89	0.08	0.39	0.75	0.34	0.51
Avail Cap(c_a), veh/h	99	2050	629	278	2554	776	349	919	780	129	1307	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	23.8	19.1	38.4	20.1	12.3	36.9	27.9	30.0	44.1	39.7	40.3
Incr Delay (d2), s/veh	22.7	1.7	0.3	20.4	2.4	0.0	20.5	0.1	0.5	8.6	0.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	11.6	3.5	6.8	15.5	0.6	8.5	0.7	3.1	1.0	1.2	1.6
LnGrp Delay(d),s/veh	65.7	25.6	19.3	58.8	22.5	12.4	57.4	27.9	30.5	52.7	40.2	42.6
LnGrp LOS	E	C	B	E	C	B	E	C	C	D	D	D
Approach Vol, veh/h		1824			2361			454			196	
Approach Delay, s/veh		26.3			25.6			46.7			43.2	
Approach LOS		C			C			D			D	

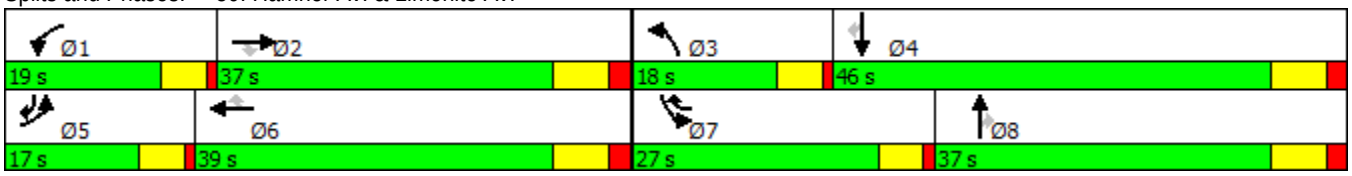
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	42.0	19.7	12.2	8.8	50.5	6.4	25.6
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	14.0	35.9	17.6	33.0	5.0	44.9	6.5	44.1
Max Q Clear Time (g_c+I1), s	12.7	25.7	15.6	5.5	5.3	33.7	3.8	8.8
Green Ext Time (p_c), s	0.0	9.9	0.1	1.0	0.0	10.8	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	1073	185	362	1369	648	237	1010	363	633	983	413
Future Volume (vph)	332	1073	185	362	1369	648	237	1010	363	633	983	413
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	7	3	8	8	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	5.0	5.0	6.0	6.0	5.0	6.0	5.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	10.0	10.0	37.0	37.0	10.0	37.0	10.0
Total Split (s)	17.0	37.0	37.0	19.0	39.0	27.0	18.0	37.0	37.0	27.0	46.0	17.0
Total Split (%)	14.2%	30.8%	30.8%	15.8%	32.5%	22.5%	15.0%	30.8%	30.8%	22.5%	38.3%	14.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0	5.0	7.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	332	1073	185	362	1369	648	237	1010	363	633	983	413
Future Volume (veh/h)	332	1073	185	362	1369	648	237	1010	363	633	983	413
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	339	1095	170	369	1397	592	242	1031	293	646	1003	380
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	356	1314	399	415	1401	735	300	1246	378	652	1767	713
Arrive On Green	0.10	0.25	0.25	0.12	0.27	0.27	0.09	0.24	0.24	0.19	0.34	0.34
Sat Flow, veh/h	3510	5187	1574	3510	5187	1610	3510	5187	1571	3510	5187	1612
Grp Volume(v), veh/h	339	1095	170	369	1397	592	242	1031	293	646	1003	380
Grp Sat Flow(s),veh/h/ln	1755	1729	1574	1755	1729	1610	1755	1729	1571	1755	1729	1612
Q Serve(g_s), s	11.4	23.7	10.7	12.3	31.9	32.0	8.0	22.3	20.6	21.8	18.7	20.4
Cycle Q Clear(g_c), s	11.4	23.7	10.7	12.3	31.9	32.0	8.0	22.3	20.6	21.8	18.7	20.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	356	1314	399	415	1401	735	300	1246	378	652	1767	713
V/C Ratio(X)	0.95	0.83	0.43	0.89	1.00	0.81	0.81	0.83	0.78	0.99	0.57	0.53
Avail Cap(c_a), veh/h	356	1314	399	415	1401	735	385	1314	398	652	1767	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	41.9	37.0	51.5	43.2	27.7	53.2	42.7	42.0	48.1	31.9	24.1
Incr Delay (d2), s/veh	35.3	5.3	1.5	19.9	23.3	7.4	7.4	5.0	10.7	32.8	0.7	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	11.9	4.8	7.1	18.2	18.0	4.2	11.3	10.1	13.5	9.0	9.4
LnGrp Delay(d),s/veh	88.2	47.1	38.6	71.3	66.5	35.2	60.6	47.7	52.7	80.9	32.6	25.6
LnGrp LOS	F	D	D	E	E	D	E	D	D	F	C	C
Approach Vol, veh/h		1604			2358			1566			2029	
Approach Delay, s/veh		54.9			59.4			50.6			46.7	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	37.0	15.1	47.4	17.0	39.0	27.0	35.5
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	14.0	30.0	13.0	39.0	12.0	32.0	22.0	30.0
Max Q Clear Time (g_c+I1), s	14.3	25.7	10.0	22.4	13.4	34.0	23.8	24.3
Green Ext Time (p_c), s	0.0	4.3	0.1	15.8	0.0	0.0	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	53.2
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBT	WBR	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1643	687	2207	913	517	0	503
Future Volume (vph)	1643	687	2207	913	517	0	503
Turn Type	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	2		6		4	4	
Permitted Phases		2		6			4
Detector Phase	2	2	6	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	36.5	36.5	23.5	23.5	23.5
Total Split (s)	54.0	54.0	54.0	54.0	26.0	26.0	26.0
Total Split (%)	67.5%	67.5%	67.5%	67.5%	32.5%	32.5%	32.5%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 12 (15%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1643	687	0	2207	913	0	0	0	517	0	503
Future Volume (veh/h)	0	1643	687	0	2207	913	0	0	0	517	0	503
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900				1900	1900	1900
Adj Flow Rate, veh/h	0	1694	708	0	2275	941				533	0	432
Adj No. of Lanes	0	3	1	0	3	1				2	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	3521	1096	0	3521	1072				665	0	593
Arrive On Green	0.00	0.68	0.68	0.00	1.00	1.00				0.18	0.00	0.18
Sat Flow, veh/h	0	5358	1615	0	5358	1579				3619	0	3230
Grp Volume(v), veh/h	0	1694	708	0	2275	941				533	0	432
Grp Sat Flow(s),veh/h/ln	0	1729	1615	0	1729	1579				1810	0	1615
Q Serve(g_s), s	0.0	12.5	20.1	0.0	0.0	0.0				11.3	0.0	10.1
Cycle Q Clear(g_c), s	0.0	12.5	20.1	0.0	0.0	0.0				11.3	0.0	10.1
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3521	1096	0	3521	1072				665	0	593
V/C Ratio(X)	0.00	0.48	0.65	0.00	0.65	0.88				0.80	0.00	0.73
Avail Cap(c_a), veh/h	0	3521	1096	0	3521	1072				927	0	828
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.39	0.39	0.00	0.35	0.35				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	6.1	7.3	0.0	0.0	0.0				31.3	0.0	30.8
Incr Delay (d2), s/veh	0.0	0.2	1.2	0.0	0.3	3.9				2.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.9	9.0	0.0	0.1	1.2				5.8	0.0	4.6
LnGrp Delay(d),s/veh	0.0	6.3	8.5	0.0	0.3	3.9				33.6	0.0	31.7
LnGrp LOS		A	A		A	A				C		C
Approach Vol, veh/h		2402			3216						965	
Approach Delay, s/veh		7.0			1.4						32.8	
Approach LOS		A			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		59.8		20.2		59.8		
Change Period (Y+Rc), s		5.5		5.5		5.5		
Max Green Setting (Gmax), s		48.5		20.5		48.5		
Max Q Clear Time (g_c+I1), s		22.1		13.3		2.0		
Green Ext Time (p_c), s		24.8		1.4		41.8		

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

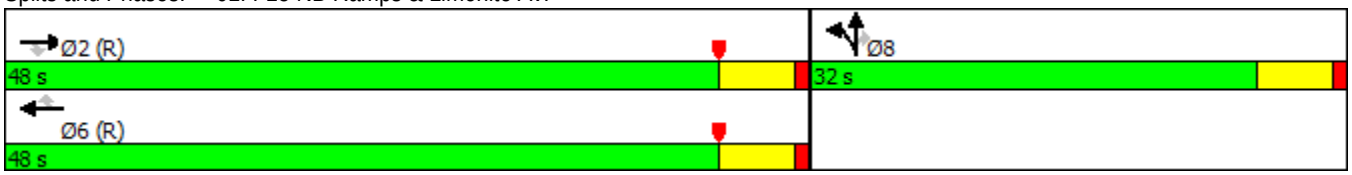
Notes

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	1920	240	2523	480	597	0	910
Future Volume (vph)	1920	240	2523	480	597	0	910
Turn Type	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	2		6		8	8	
Permitted Phases		2		6			8
Detector Phase	2	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	48.0	48.0	48.0	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1920	240	0	2523	480	597	0	910	0	0	0
Future Volume (veh/h)	0	1920	240	0	2523	480	597	0	910	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	0	1939	242	0	2548	456	603	0	687			
Adj No. of Lanes	0	3	1	0	3	1	2	0	2			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	0	3086	959	0	3086	941	968	0	863			
Arrive On Green	0.00	1.00	1.00	0.00	0.60	0.60	0.27	0.00	0.27			
Sat Flow, veh/h	0	5358	1612	0	5358	1581	3619	0	3226			
Grp Volume(v), veh/h	0	1939	242	0	2548	456	603	0	687			
Grp Sat Flow(s),veh/h/ln	0	1729	1612	0	1729	1581	1810	0	1613			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	31.3	13.1	11.7	0.0	15.9			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	31.3	13.1	11.7	0.0	15.9			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	3086	959	0	3086	941	968	0	863			
V/C Ratio(X)	0.00	0.63	0.25	0.00	0.83	0.48	0.62	0.00	0.80			
Avail Cap(c_a), veh/h	0	3086	959	0	3086	941	1199	0	1069			
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.83	0.83	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	12.9	9.2	25.8	0.0	27.3			
Incr Delay (d2), s/veh	0.0	0.8	0.5	0.0	2.7	1.8	0.7	0.0	3.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.1	0.0	15.4	6.2	6.0	0.0	7.5			
LnGrp Delay(d),s/veh	0.0	0.8	0.5	0.0	15.6	11.0	26.4	0.0	30.7			
LnGrp LOS		A	A		B	B	C		C			
Approach Vol, veh/h		2181			3004			1290				
Approach Delay, s/veh		0.8			14.9			28.7				
Approach LOS		A			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		53.1				53.1		26.9
Change Period (Y+Rc), s		5.5				5.5		5.5
Max Green Setting (Gmax), s		42.5				42.5		26.5
Max Q Clear Time (g_c+I1), s		2.0				33.3		17.9
Green Ext Time (p_c), s		37.0				9.0		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Notes

APPENDIX 9.12:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	729	1392	774	440	510	261
Future Volume (vph)	729	1392	774	440	510	261
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	39.0	81.0	42.0	42.0	39.0	39.0
Total Split (%)	32.5%	67.5%	35.0%	35.0%	32.5%	32.5%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	32.4	74.5	37.1	37.1	33.0	33.0
Actuated g/C Ratio	0.27	0.62	0.31	0.31	0.28	0.28
v/c Ratio	0.91	0.65	0.73	0.77	0.83	0.76
Control Delay	69.2	12.6	42.0	34.4	58.5	43.2
Queue Delay	0.0	0.0	2.1	1.0	0.0	0.0
Total Delay	69.2	12.6	44.1	35.4	58.5	43.2
LOS	E	B	D	D	E	D
Approach Delay		32.0	41.0			48.4
Approach LOS		C	D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 38.3	Intersection LOS: D
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	729	1392	0	0	774	440	510	261	228	0	0	0
Future Volume (veh/h)	729	1392	0	0	774	440	510	261	228	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1900	0	0	1900	1900	1800	1900	1900			
Adj Flow Rate, veh/h	767	1465	0	0	815	462	350	537	237			
Adj No. of Lanes	2	2	0	0	2	1	1	2	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	828	2241	0	0	1139	501	471	689	303			
Arrive On Green	0.26	0.62	0.00	0.00	0.32	0.32	0.28	0.28	0.28			
Sat Flow, veh/h	3141	3705	0	0	3705	1587	1714	2504	1102			
Grp Volume(v), veh/h	767	1465	0	0	815	462	350	407	367			
Grp Sat Flow(s),veh/h/ln	1570	1805	0	0	1805	1587	1714	1900	1706			
Q Serve(g_s), s	28.5	31.1	0.0	0.0	24.0	33.7	22.3	23.7	23.8			
Cycle Q Clear(g_c), s	28.5	31.1	0.0	0.0	24.0	33.7	22.3	23.7	23.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.65			
Lane Grp Cap(c), veh/h	828	2241	0	0	1139	501	471	523	469			
V/C Ratio(X)	0.93	0.65	0.00	0.00	0.72	0.92	0.74	0.78	0.78			
Avail Cap(c_a), veh/h	890	2241	0	0	1139	501	471	523	469			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.84	0.84	0.00	0.00	0.58	0.58	1.00	1.00	1.00			
Uniform Delay (d), s/veh	43.0	14.5	0.0	0.0	36.3	39.7	39.6	40.1	40.2			
Incr Delay (d2), s/veh	12.9	1.3	0.0	0.0	2.3	16.7	10.1	10.9	12.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	13.8	15.7	0.0	0.0	12.2	17.1	11.9	14.0	12.8			
LnGrp Delay(d),s/veh	56.0	15.8	0.0	0.0	38.6	56.4	49.7	51.1	52.4			
LnGrp LOS	E	B			D	E	D	D	D			
Approach Vol, veh/h		2232			1277			1124				
Approach Delay, s/veh		29.6			45.0			51.1				
Approach LOS		C			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		81.0			36.6	44.4		39.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		74.5			34.0	35.5		33.0
Max Q Clear Time (g_c+I1), s		33.1			30.5	35.7		25.8
Green Ext Time (p_c), s		28.5			1.1	0.0		3.2

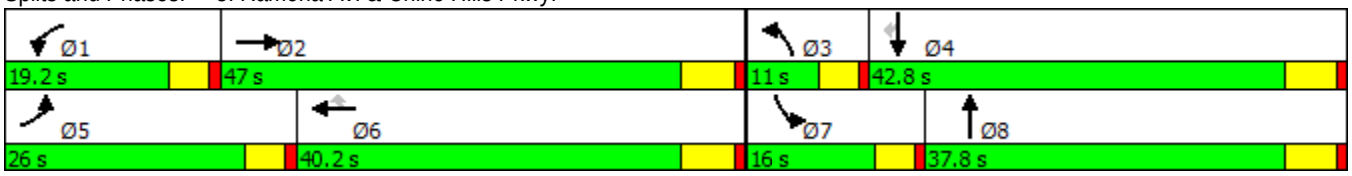
Intersection Summary	
HCM 2010 Ctrl Delay	39.1
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	500	1111	142	860	127	28	459	119	369	327
Future Volume (vph)	500	1111	142	860	127	28	459	119	369	327
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	26.0	47.0	19.2	40.2	40.2	11.0	37.8	16.0	42.8	42.8
Total Split (%)	21.7%	39.2%	16.0%	33.5%	33.5%	9.2%	31.5%	13.3%	35.7%	35.7%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	20.6	41.0	13.0	33.5	33.5	5.9	32.1	10.7	40.9	40.9
Actuated g/C Ratio	0.18	0.35	0.11	0.28	0.28	0.05	0.27	0.09	0.35	0.35
v/c Ratio	0.91	0.65	0.79	0.88	0.23	0.34	0.72	0.81	0.31	0.44
Control Delay	68.5	34.6	79.1	51.7	1.9	65.9	40.7	87.8	30.3	5.2
Queue Delay	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.5	35.7	79.1	51.7	1.9	65.9	40.7	87.8	30.3	5.2
LOS	E	D	E	D	A	E	D	F	C	A
Approach Delay		45.9		49.5			41.7		28.6	
Approach LOS		D		D			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.7	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 42.8	Intersection LOS: D
Intersection Capacity Utilization 89.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	1111	9	142	860	127	28	459	207	119	369	327
Future Volume (veh/h)	500	1111	9	142	860	127	28	459	207	119	369	327
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	526	1169	8	149	905	117	29	483	150	125	388	248
Adj No. of Lanes	2	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	579	1902	13	175	1033	455	45	742	229	150	1211	533
Arrive On Green	0.17	0.36	0.36	0.10	0.29	0.29	0.03	0.27	0.27	0.09	0.34	0.34
Sat Flow, veh/h	3326	5315	36	1714	3610	1591	1714	2708	835	1714	3610	1588
Grp Volume(v), veh/h	526	761	416	149	905	117	29	321	312	125	388	248
Grp Sat Flow(s),veh/h/ln	1663	1729	1893	1714	1805	1591	1714	1805	1738	1714	1805	1588
Q Serve(g_s), s	18.1	21.1	21.1	10.0	27.9	6.6	2.0	18.3	18.5	8.4	9.3	14.4
Cycle Q Clear(g_c), s	18.1	21.1	21.1	10.0	27.9	6.6	2.0	18.3	18.5	8.4	9.3	14.4
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	579	1238	678	175	1033	455	45	495	476	150	1211	533
V/C Ratio(X)	0.91	0.61	0.61	0.85	0.88	0.26	0.65	0.65	0.66	0.83	0.32	0.47
Avail Cap(c_a), veh/h	610	1238	678	214	1064	469	94	495	476	167	1211	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.3	30.8	30.8	51.5	39.7	32.1	56.3	37.4	37.5	52.4	28.9	30.5
Incr Delay (d2), s/veh	16.6	1.1	2.0	19.8	8.5	0.4	5.7	6.4	6.9	24.2	0.7	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	10.2	11.4	5.7	15.0	3.0	1.0	10.0	9.8	5.0	4.8	6.7
LnGrp Delay(d),s/veh	63.9	31.9	32.8	71.3	48.2	32.5	62.0	43.8	44.3	76.6	29.6	33.4
LnGrp LOS	E	C	C	E	D	C	E	D	D	E	C	C
Approach Vol, veh/h		1703			1171			662			761	
Approach Delay, s/veh		42.0			49.6			44.9			38.6	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.5	47.6	7.6	45.0	24.9	39.2	14.8	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	14.6	41.2	6.4	37.0	21.4	34.4	11.4	32.0
Max Q Clear Time (g_c+I1), s	12.0	23.1	4.0	16.4	20.1	29.9	10.4	20.5
Green Ext Time (p_c), s	0.0	14.9	0.0	7.0	0.2	3.5	0.0	5.2

Intersection Summary	
HCM 2010 Ctrl Delay	43.9
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	1142	166	44	910	142
Future Volume (vph)	1142	166	44	910	142
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	2		1	6	8
Permitted Phases		2			
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	24.8	24.8	9.6	15.8	26.1
Total Split (s)	29.3	29.3	9.6	38.9	26.1
Total Split (%)	45.1%	45.1%	14.8%	59.8%	40.2%
Yellow Time (s)	4.8	4.8	3.6	4.8	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	5.8	5.1
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	24.1	24.1	5.1	27.3	12.7
Actuated g/C Ratio	0.47	0.47	0.10	0.53	0.25
v/c Ratio	0.74	0.21	0.28	0.52	0.46
Control Delay	17.5	3.4	29.4	9.3	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	3.4	29.4	9.3	18.7
LOS	B	A	C	A	B
Approach Delay	15.7			10.2	18.7
Approach LOS	B			B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 51.2	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 58.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Monte Vista Av. & Chino Hills Pkwy.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1142	166	44	910	142	41
Future Volume (veh/h)	1142	166	44	910	142	41
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1255	182	48	1000	156	45
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1633	731	83	2133	253	73
Arrive On Green	0.45	0.45	0.05	0.59	0.20	0.20
Sat Flow, veh/h	3705	1615	1714	3705	1290	372
Grp Volume(v), veh/h	1255	182	48	1000	202	0
Grp Sat Flow(s),veh/h/ln	1805	1615	1714	1805	1670	0
Q Serve(g_s), s	14.9	3.6	1.4	8.0	5.7	0.0
Cycle Q Clear(g_c), s	14.9	3.6	1.4	8.0	5.7	0.0
Prop In Lane		1.00	1.00		0.77	0.22
Lane Grp Cap(c), veh/h	1633	731	83	2133	327	0
V/C Ratio(X)	0.77	0.25	0.58	0.47	0.62	0.00
Avail Cap(c_a), veh/h	1661	743	168	2340	687	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.7	8.6	23.8	5.9	18.8	0.0
Incr Delay (d2), s/veh	2.4	0.3	2.4	0.2	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	1.6	0.7	4.0	2.8	0.0
LnGrp Delay(d),s/veh	14.1	8.9	26.2	6.1	20.7	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	1437			1048	202	
Approach Delay, s/veh	13.4			7.1	20.7	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.1	28.9				36.0		15.1
Change Period (Y+Rc), s	4.6	5.8				5.8		5.1
Max Green Setting (Gmax), s	5.0	23.5				33.1		21.0
Max Q Clear Time (g_c+I1), s	3.4	16.9				10.0		7.7
Green Ext Time (p_c), s	0.0	6.2				19.8		0.5

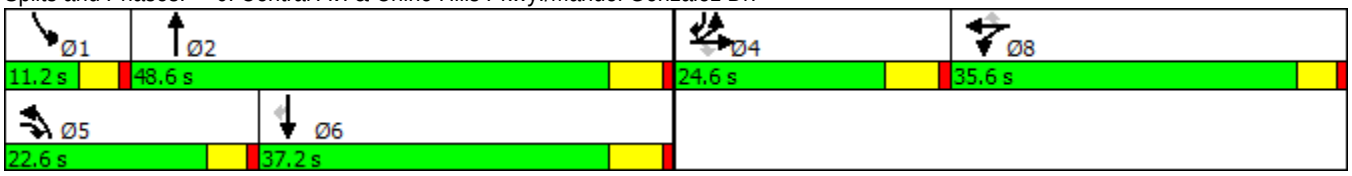
Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	439	60	382	2	4	8	481	1081	74	900	288
Future Volume (vph)	439	60	382	2	4	8	481	1081	74	900	288
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Prot	NA	pm+ov
Protected Phases	4	4	5	8	8		5	2	1	6	4
Permitted Phases			4			8					6
Detector Phase	4	4	5	8	8	8	5	2	1	6	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	9.6	30.8	15.8
Total Split (s)	24.6	24.6	22.6	35.6	35.6	35.6	22.6	48.6	11.2	37.2	24.6
Total Split (%)	20.5%	20.5%	18.8%	29.7%	29.7%	29.7%	18.8%	40.5%	9.3%	31.0%	20.5%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max	None	Max	None
Act Effct Green (s)	19.2	19.2	41.8	13.5	13.5	13.5	18.3	43.6	6.7	32.0	51.2
Actuated g/C Ratio	0.20	0.20	0.44	0.14	0.14	0.14	0.19	0.46	0.07	0.34	0.54
v/c Ratio	0.81	0.78	0.44	0.01	0.01	0.02	0.81	0.74	0.66	0.80	0.32
Control Delay	58.5	54.5	2.9	35.5	35.5	0.1	49.4	26.6	72.0	36.2	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	54.5	2.9	35.5	35.5	0.1	49.4	26.6	72.0	36.2	5.3
LOS	E	D	A	D	D	A	D	C	E	D	A
Approach Delay		33.3			14.3			33.4		31.3	
Approach LOS		C			B			C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94.4	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 32.6	Intersection LOS: C
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	439	60	382	2	4	8	481	1081	51	74	900	288
Future Volume (veh/h)	439	60	382	2	4	8	481	1081	51	74	900	288
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	523	0	319	2	4	4	523	1175	43	80	978	258
Adj No. of Lanes	2	0	1	1	1	1	2	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	653	0	598	42	47	40	598	1734	63	101	1328	894
Arrive On Green	0.19	0.00	0.19	0.02	0.02	0.02	0.18	0.49	0.49	0.06	0.37	0.37
Sat Flow, veh/h	3429	0	1615	1714	1900	1615	3326	3549	130	1714	3610	1595
Grp Volume(v), veh/h	523	0	319	2	4	4	523	597	621	80	978	258
Grp Sat Flow(s),veh/h/ln	1714	0	1615	1714	1900	1615	1663	1805	1874	1714	1805	1595
Q Serve(g_s), s	12.8	0.0	13.6	0.1	0.2	0.2	13.4	22.2	22.2	4.0	20.6	7.5
Cycle Q Clear(g_c), s	12.8	0.0	13.6	0.1	0.2	0.2	13.4	22.2	22.2	4.0	20.6	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	653	0	598	42	47	40	598	882	915	101	1328	894
V/C Ratio(X)	0.80	0.00	0.53	0.05	0.09	0.10	0.87	0.68	0.68	0.79	0.74	0.29
Avail Cap(c_a), veh/h	736	0	637	607	672	571	683	882	915	129	1328	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	0.0	21.7	41.7	41.8	41.8	35.0	17.1	17.1	40.7	24.0	10.2
Incr Delay (d2), s/veh	5.7	0.0	0.7	0.5	0.8	1.1	10.1	4.2	4.0	17.0	3.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	6.2	0.1	0.1	0.1	7.0	12.0	12.4	2.4	10.9	4.9
LnGrp Delay(d),s/veh	39.6	0.0	22.4	42.2	42.5	42.9	45.1	21.3	21.2	57.7	27.7	11.0
LnGrp LOS	D		C	D	D	D	D	C	C	E	C	B
Approach Vol, veh/h		842			10			1741			1316	
Approach Delay, s/veh		33.1			42.6			28.4			26.2	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	48.6		22.5	20.3	38.0		6.8
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	6.6	42.8		18.8	18.0	31.4		31.0
Max Q Clear Time (g_c+I1), s	6.0	24.2		15.6	15.4	22.6		2.2
Green Ext Time (p_c), s	0.0	16.1		1.1	0.3	8.1		0.0

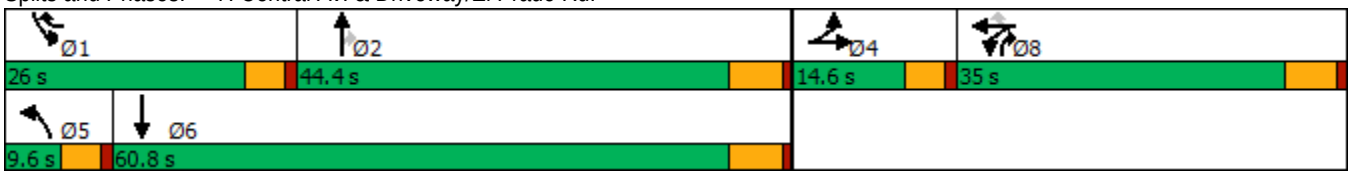
Intersection Summary	
HCM 2010 Ctrl Delay	28.7
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	1	401	4	230	2	666	480	348	794
Future Volume (vph)	1	1	401	4	230	2	666	480	348	794
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	35.0	35.0	26.0	9.6	44.4	35.0	26.0	60.8
Total Split (%)	12.2%	12.2%	29.2%	29.2%	21.7%	8.0%	37.0%	29.2%	21.7%	50.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.2	10.2	20.1	20.1	41.3	5.1	39.8	59.9	15.2	58.2
Actuated g/C Ratio	0.11	0.11	0.21	0.21	0.44	0.05	0.42	0.64	0.16	0.62
v/c Ratio	0.01	0.01	0.64	0.62	0.30	0.02	0.48	0.45	0.72	0.28
Control Delay	46.0	39.5	43.7	42.1	3.1	50.5	23.7	2.5	46.8	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	39.5	43.7	42.1	3.1	50.5	23.7	2.5	46.8	10.6
LOS	D	D	D	D	A	D	C	A	D	B
Approach Delay		41.7		28.5			14.9			21.5
Approach LOS		D		C			B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 94	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 20.5	Intersection LOS: C
Intersection Capacity Utilization 61.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	401	4	230	2	666	480	348	794	11
Future Volume (veh/h)	1	1	1	401	4	230	2	666	480	348	794	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	1	1	1	449	0	113	2	740	364	387	882	10
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	14	7	7	570	0	495	5	1658	1001	467	3157	36
Arrive On Green	0.01	0.01	0.01	0.17	0.00	0.17	0.00	0.46	0.46	0.14	0.60	0.60
Sat Flow, veh/h	1714	873	873	3429	0	1615	1714	3610	1595	3326	5288	60
Grp Volume(v), veh/h	1	0	2	449	0	113	2	740	364	387	577	315
Grp Sat Flow(s),veh/h/ln	1714	0	1746	1714	0	1615	1714	1805	1595	1663	1729	1889
Q Serve(g_s), s	0.1	0.0	0.1	11.6	0.0	4.8	0.1	12.8	10.2	10.4	7.4	7.4
Cycle Q Clear(g_c), s	0.1	0.0	0.1	11.6	0.0	4.8	0.1	12.8	10.2	10.4	7.4	7.4
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	14	0	14	570	0	495	5	1658	1001	467	2065	1128
V/C Ratio(X)	0.07	0.00	0.14	0.79	0.00	0.23	0.43	0.45	0.36	0.83	0.28	0.28
Avail Cap(c_a), veh/h	186	0	190	1087	0	739	93	1658	1001	773	2065	1128
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	45.4	36.8	0.0	23.8	45.9	16.9	8.4	38.5	9.0	9.0
Incr Delay (d2), s/veh	0.8	0.0	1.7	2.5	0.0	0.2	21.7	0.9	1.0	1.5	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	5.7	0.0	2.2	0.1	6.6	6.8	4.9	3.6	4.0
LnGrp Delay(d),s/veh	46.2	0.0	47.1	39.3	0.0	24.0	67.6	17.8	9.4	40.0	9.3	9.6
LnGrp LOS	D		D	D		C	E	B	A	D	A	A
Approach Vol, veh/h		3			562			1106			1279	
Approach Delay, s/veh		46.8			36.2			15.1			18.7	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	17.5	48.1		5.3	4.8	60.8		21.1
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	21.4	38.6		10.0	5.0	55.0		29.2
Max Q Clear Time (g_c+I1), s	12.4	14.8		2.1	2.1	9.4		13.6
Green Ext Time (p_c), s	0.5	9.1		0.0	0.0	9.3		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C

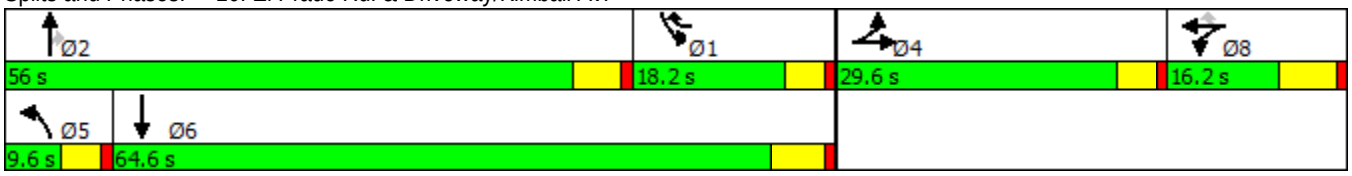
Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	1	30	545	6	35	56	692	59
Future Volume (vph)	13	1	30	545	6	35	56	692	59
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	29.6	29.6	16.2	18.2	9.6	56.0	56.0	18.2	64.6
Total Split (%)	24.7%	24.7%	13.5%	15.2%	8.0%	46.7%	46.7%	15.2%	53.8%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.6	12.6	10.4	29.4	5.2	10.4	10.4	14.1	18.6
Actuated g/C Ratio	0.22	0.22	0.18	0.50	0.09	0.18	0.18	0.24	0.32
v/c Ratio	0.04	0.01	0.38	0.51	0.04	0.11	0.15	0.88	0.19
Control Delay	20.1	16.0	29.1	2.9	31.3	26.2	0.8	40.2	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	16.0	29.1	2.9	31.3	26.2	0.8	40.2	13.1
LOS	C	B	C	A	C	C	A	D	B
Approach Delay		19.3	7.6			11.9			36.5
Approach LOS		B	A			B			D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 58.4
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 22.6 — Intersection LOS: C
Intersection Capacity Utilization 62.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	2	91	30	545	6	35	56	692	59	49
Future Volume (veh/h)	13	1	2	91	30	545	6	35	56	692	59	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	13	1	1	93	31	301	6	36	57	706	60	50
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	64	32	32	239	80	662	149	330	281	786	320	267
Arrive On Green	0.04	0.04	0.04	0.17	0.17	0.17	0.09	0.17	0.17	0.24	0.33	0.33
Sat Flow, veh/h	1714	873	873	1373	458	1615	1714	1900	1615	3326	959	799
Grp Volume(v), veh/h	13	0	2	124	0	301	6	36	57	706	0	110
Grp Sat Flow(s),veh/h/ln	1714	0	1746	1831	0	1615	1714	1900	1615	1663	0	1758
Q Serve(g_s), s	0.4	0.0	0.1	3.5	0.0	0.0	0.2	0.9	1.7	11.8	0.0	2.6
Cycle Q Clear(g_c), s	0.4	0.0	0.1	3.5	0.0	0.0	0.2	0.9	1.7	11.8	0.0	2.6
Prop In Lane	1.00		0.50	0.75		1.00	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	64	0	65	318	0	662	149	330	281	786	0	587
V/C Ratio(X)	0.20	0.00	0.03	0.39	0.00	0.45	0.04	0.11	0.20	0.90	0.00	0.19
Avail Cap(c_a), veh/h	745	0	759	318	0	663	149	1678	1426	786	0	1797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	26.7	21.1	0.0	12.3	24.1	20.0	20.3	21.3	0.0	13.6
Incr Delay (d2), s/veh	1.6	0.0	0.2	0.8	0.0	0.5	0.0	0.1	0.4	12.8	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.8	0.0	3.5	0.1	0.5	0.8	6.8	0.0	1.2
LnGrp Delay(d),s/veh	28.4	0.0	26.9	21.8	0.0	12.8	24.1	20.2	20.7	34.1	0.0	13.8
LnGrp LOS	C		C	C		B	C	C	C	C		B
Approach Vol, veh/h		15			425			99			816	
Approach Delay, s/veh		28.2			15.4			20.7			31.3	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.4	15.2		6.7	9.6	25.0		16.2
Change Period (Y+Rc), s	5.8	* 5.2		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	13.6	* 51		25.0	5.0	58.8		10.0
Max Q Clear Time (g_c+I1), s	13.8	3.7		2.4	2.2	4.6		5.5
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	1.9		0.7

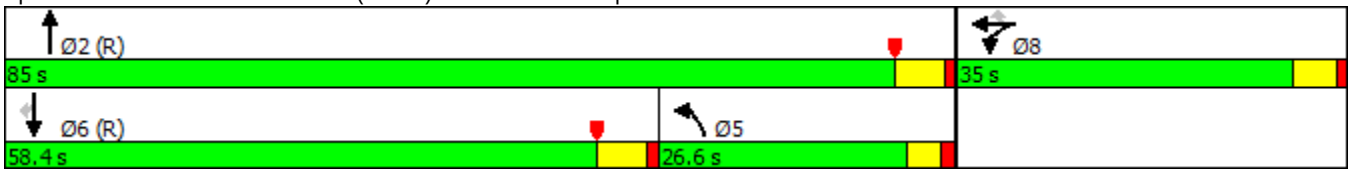
Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	702	2	401	545	1472	1445	796
Future Volume (vph)	702	2	401	545	1472	1445	796
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	35.0	35.0	35.0	26.6	85.0	58.4	58.4
Total Split (%)	29.2%	29.2%	29.2%	22.2%	70.8%	48.7%	48.7%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lag		Lead	Lead
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	30.0	30.0	30.0	22.1	79.5	52.9	52.9
Actuated g/C Ratio	0.25	0.25	0.25	0.18	0.66	0.44	0.44
v/c Ratio	1.02	0.99	0.84	0.96	0.66	0.98	0.83
Control Delay	95.2	86.6	51.7	56.3	4.4	51.0	15.9
Queue Delay	0.0	0.0	0.0	0.0	1.1	41.0	0.0
Total Delay	95.2	86.6	51.7	56.3	5.5	91.9	15.9
LOS	F	F	D	E	A	F	B
Approach Delay		78.8			19.2	64.9	
Approach LOS		E			B	E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 107 (89%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 50.6	Intersection LOS: D
Intersection Capacity Utilization 102.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	702	2	401	545	1472	0	0	1445	796
Future Volume (veh/h)	0	0	0	702	2	401	545	1472	0	0	1445	796
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1800	1900	1900	1800	1900	0	0	1900	1900
Adj Flow Rate, veh/h				842	0	185	586	1583	0	0	1554	856
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				857	0	404	850	2679	0	0	1591	697
Arrive On Green				0.25	0.00	0.25	0.51	1.00	0.00	0.00	0.44	0.44
Sat Flow, veh/h				3429	0	1615	3326	3705	0	0	3705	1582
Grp Volume(v), veh/h				842	0	185	586	1583	0	0	1554	856
Grp Sat Flow(s),veh/h/ln				1714	0	1615	1663	1805	0	0	1805	1582
Q Serve(g_s), s				29.3	0.0	11.6	16.0	0.0	0.0	0.0	50.7	52.9
Cycle Q Clear(g_c), s				29.3	0.0	11.6	16.0	0.0	0.0	0.0	50.7	52.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				857	0	404	850	2679	0	0	1591	697
V/C Ratio(X)				0.98	0.00	0.46	0.69	0.59	0.00	0.00	0.98	1.23
Avail Cap(c_a), veh/h				857	0	404	850	2679	0	0	1591	697
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.37	0.37	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				44.7	0.0	38.1	25.8	0.0	0.0	0.0	32.9	33.5
Incr Delay (d2), s/veh				26.3	0.0	0.3	0.7	0.4	0.0	0.0	17.6	114.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.9	0.0	5.2	7.2	0.1	0.0	0.0	29.1	45.3
LnGrp Delay(d),s/veh				71.0	0.0	38.4	26.5	0.4	0.0	0.0	50.6	148.3
LnGrp LOS				E		D	C	A			D	F
Approach Vol, veh/h					1027			2169			2410	
Approach Delay, s/veh					65.1			7.4			85.3	
Approach LOS					E			A			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		94.7			36.3	58.4		35.0
Change Period (Y+Rc), s		5.5			5.5	* 5.5		5.0
Max Green Setting (Gmax), s		79.5			22.1	* 53		30.0
Max Q Clear Time (g_c+I1), s		2.0			18.0	54.9		31.3
Green Ext Time (p_c), s		34.7			3.3	0.0		0.0

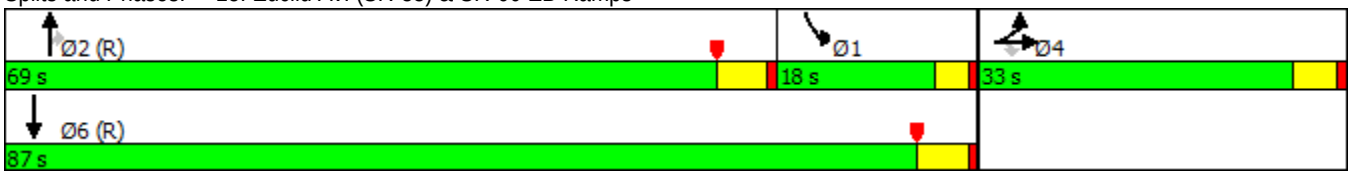
Intersection Summary	
HCM 2010 Ctrl Delay	51.5
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	423	0	466	1594	784	313	1835
Future Volume (vph)	423	0	466	1594	784	313	1835
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	33.0	33.0	33.0	69.0	69.0	18.0	87.0
Total Split (%)	27.5%	27.5%	27.5%	57.5%	57.5%	15.0%	72.5%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	26.5	26.5	26.5	65.3	65.3	13.7	83.0
Actuated g/C Ratio	0.22	0.22	0.22	0.54	0.54	0.11	0.69
v/c Ratio	0.92	0.80	0.77	0.86	0.72	0.88	0.78
Control Delay	76.5	49.0	46.6	16.1	9.3	67.0	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	47.5
Total Delay	76.5	49.0	46.6	16.1	9.3	67.0	64.0
LOS	E	D	D	B	A	E	E
Approach Delay		57.8		13.8			64.4
Approach LOS		E		B			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 41.1	Intersection LOS: D
Intersection Capacity Utilization 102.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	423	0	466	0	0	0	0	1594	784	313	1835	0
Future Volume (veh/h)	423	0	466	0	0	0	0	1594	784	313	1835	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900				0	1900	1900	1800	1900	0
Adj Flow Rate, veh/h	578	0	275				0	1696	834	333	1952	0
Adj No. of Lanes	2	0	1				0	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	656	0	309				0	1645	734	730	2603	0
Arrive On Green	0.19	0.00	0.19				0.00	0.91	0.91	0.44	1.00	0.00
Sat Flow, veh/h	3429	0	1615				0	3705	1611	3326	3705	0
Grp Volume(v), veh/h	578	0	275				0	1696	834	333	1952	0
Grp Sat Flow(s),veh/h/ln	1714	0	1615				0	1805	1611	1663	1805	0
Q Serve(g_s), s	19.7	0.0	19.9				0.0	54.7	54.7	8.4	0.0	0.0
Cycle Q Clear(g_c), s	19.7	0.0	19.9				0.0	54.7	54.7	8.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	656	0	309				0	1645	734	730	2603	0
V/C Ratio(X)	0.88	0.00	0.89				0.00	1.03	1.14	0.46	0.75	0.00
Avail Cap(c_a), veh/h	800	0	377				0	1910	852	730	2603	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.09	0.09	0.12	0.12	0.00
Uniform Delay (d), s/veh	47.2	0.0	47.3				0.0	5.3	5.3	28.6	0.0	0.0
Incr Delay (d2), s/veh	8.6	0.0	17.5				0.0	16.6	63.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	0.0	10.4				0.0	26.2	32.8	3.8	0.1	0.0
LnGrp Delay(d),s/veh	55.7	0.0	64.8				0.0	22.0	68.4	28.7	0.3	0.0
LnGrp LOS	E		E					F	F	C	A	
Approach Vol, veh/h		853						2530			2285	
Approach Delay, s/veh		58.6						37.3			4.4	
Approach LOS		E						D			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	27.6	64.4		28.0		92.0		
Change Period (Y+Rc), s	5.5	* 5.5		5.0		5.5		
Max Green Setting (Gmax), s	14.0	* 64		28.0		81.5		
Max Q Clear Time (g_c+I1), s	10.4	56.7		21.9		2.0		
Green Ext Time (p_c), s	2.5	6.5		1.1		49.0		

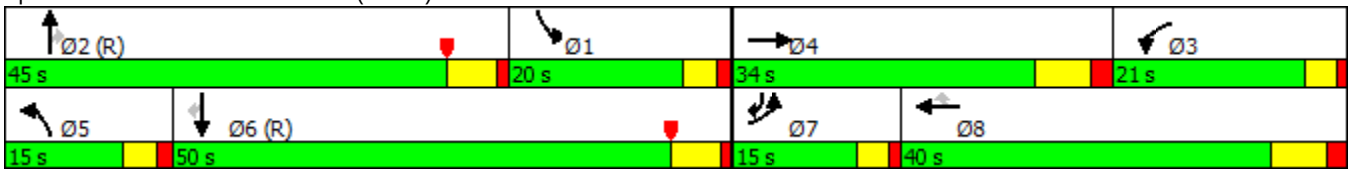
Intersection Summary	
HCM 2010 Ctrl Delay	27.2
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	189	501	279	507	67	153	1606	338	238	1940	196
Future Volume (vph)	189	501	279	507	67	153	1606	338	238	1940	196
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	15.0	34.0	21.0	40.0	40.0	15.0	45.0	45.0	20.0	50.0	15.0
Total Split (%)	12.5%	28.3%	17.5%	33.3%	33.3%	12.5%	37.5%	37.5%	16.7%	41.7%	12.5%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	11.0	26.7	17.3	33.0	33.0	10.5	39.5	39.5	15.5	44.5	61.0
Actuated g/C Ratio	0.09	0.22	0.14	0.28	0.28	0.09	0.33	0.33	0.13	0.37	0.51
v/c Ratio	1.28	0.91	1.20	0.54	0.13	1.08	0.99	0.49	1.14	1.06	0.23
Control Delay	208.1	59.8	165.5	39.4	0.5	126.1	60.4	20.4	130.5	70.0	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	208.1	59.8	165.5	39.4	0.5	126.1	60.4	20.4	130.5	70.0	14.7
LOS	F	E	F	D	A	F	E	C	F	E	B
Approach Delay		91.4		77.6			58.8			71.5	
Approach LOS		F		E			E			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 50 (42%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 70.9	Intersection LOS: E
Intersection Capacity Utilization 100.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	501	196	279	507	67	153	1606	338	238	1940	196
Future Volume (veh/h)	189	501	196	279	507	67	153	1606	338	238	1940	196
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	199	527	183	294	534	66	161	1691	275	251	2042	140
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	157	577	199	243	1065	476	150	1707	532	1744	6573	2195
Arrive On Green	0.09	0.22	0.22	0.14	0.29	0.29	0.03	0.11	0.11	0.34	0.42	0.42
Sat Flow, veh/h	1714	2623	907	1714	3610	1613	1714	5187	1615	1714	5187	1615
Grp Volume(v), veh/h	199	362	348	294	534	66	161	1691	275	251	2042	140
Grp Sat Flow(s),veh/h/ln	1714	1805	1724	1714	1805	1613	1714	1729	1615	1714	1729	1615
Q Serve(g_s), s	11.0	23.5	23.7	17.0	14.7	2.6	10.5	39.1	19.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.0	23.5	23.7	17.0	14.7	2.6	10.5	39.1	19.3	0.0	0.0	0.0
Prop In Lane	1.00		0.53	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	397	379	243	1065	476	150	1707	532	1744	6573	2195
V/C Ratio(X)	1.27	0.91	0.92	1.21	0.50	0.14	1.07	0.99	0.52	0.14	0.31	0.06
Avail Cap(c_a), veh/h	157	406	388	243	1065	476	150	1707	532	1744	6573	2195
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.57	0.57	0.57	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.5	45.7	45.7	51.5	35.0	15.6	58.3	53.3	44.5	0.0	0.0	0.0
Incr Delay (d2), s/veh	160.5	24.6	26.5	126.6	0.5	0.2	76.1	14.3	2.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	14.4	14.1	16.6	7.4	1.2	8.2	21.0	9.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	215.0	70.2	72.2	178.1	35.5	15.8	134.3	67.6	46.5	0.0	0.0	0.0
LnGrp LOS	F	E	E	F	D	B	F	E	D	A	A	A
Approach Vol, veh/h		909			894			2127			2433	
Approach Delay, s/veh		102.7			81.0			69.9			0.0	
Approach LOS		F			F			E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	128.4	45.0	24.0	33.4	15.0	158.4	15.0	42.4
Change Period (Y+Rc), s	5.5	* 5.5	7.0	* 7	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	15.5	* 40	17.0	* 27	10.5	44.5	11.0	33.0
Max Q Clear Time (g_c+I1), s	2.0	41.1	19.0	25.7	12.5	2.0	13.0	16.7
Green Ext Time (p_c), s	10.9	0.0	0.0	0.7	0.0	25.3	0.0	4.5

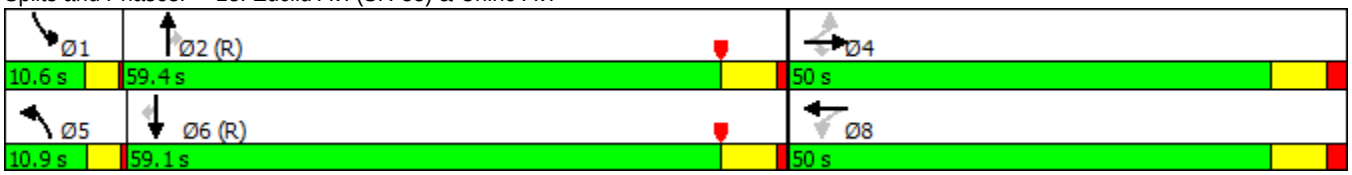
Intersection Summary	
HCM 2010 Ctrl Delay	49.4
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	212	233	93	152	211	89	1800	209	58	2265	128
Future Volume (vph)	212	233	93	152	211	89	1800	209	58	2265	128
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	50.0	50.0	50.0	50.0	50.0	10.9	59.4	59.4	10.6	59.1	59.1
Total Split (%)	41.7%	41.7%	41.7%	41.7%	41.7%	9.1%	49.5%	49.5%	8.8%	49.3%	49.3%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	38.5	38.5	38.5	38.5	38.5	8.4	59.9	59.9	6.8	56.6	56.6
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.07	0.50	0.50	0.06	0.47	0.47
v/c Ratio	0.99	0.40	0.17	0.54	0.56	0.79	0.73	0.26	0.64	0.98	0.17
Control Delay	98.4	32.9	5.8	39.6	34.3	83.8	30.0	13.6	71.8	12.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.4	32.9	5.8	39.6	34.3	83.8	30.0	13.6	71.8	12.9	0.5
LOS	F	C	A	D	C	F	C	B	E	B	A
Approach Delay		54.0			36.0		30.6			13.6	
Approach LOS		D			D		C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 103 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 25.8	Intersection LOS: C
Intersection Capacity Utilization 99.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	233	93	152	211	107	89	1800	209	58	2265	128
Future Volume (veh/h)	212	233	93	152	211	107	89	1800	209	58	2265	128
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	223	245	74	160	222	109	94	1895	184	61	2384	106
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	287	681	571	344	432	212	106	2383	742	77	2295	714
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.04	0.31	0.31	0.09	0.89	0.89
Sat Flow, veh/h	1066	1900	1595	1077	1204	591	1714	5187	1615	1714	5187	1613
Grp Volume(v), veh/h	223	245	74	160	0	331	94	1895	184	61	2384	106
Grp Sat Flow(s),veh/h/ln	1066	1900	1595	1077	0	1796	1714	1729	1615	1714	1729	1613
Q Serve(g_s), s	25.0	11.4	3.7	15.4	0.0	17.4	6.5	40.2	10.2	4.2	53.1	1.0
Cycle Q Clear(g_c), s	42.4	11.4	3.7	26.8	0.0	17.4	6.5	40.2	10.2	4.2	53.1	1.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	681	571	344	0	643	106	2383	742	77	2295	714
V/C Ratio(X)	0.78	0.36	0.13	0.47	0.00	0.51	0.89	0.80	0.25	0.79	1.04	0.15
Avail Cap(c_a), veh/h	287	681	571	344	0	643	106	2383	742	101	2295	714
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	0.09	0.09	0.09
Uniform Delay (d), s/veh	47.0	28.4	25.9	38.2	0.0	30.3	57.1	36.4	26.0	54.1	6.9	3.9
Incr Delay (d2), s/veh	12.5	0.3	0.1	1.0	0.0	0.7	44.9	2.3	0.6	2.1	19.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	6.0	1.7	4.7	0.0	8.8	4.4	19.7	4.7	2.0	26.2	0.4
LnGrp Delay(d),s/veh	59.5	28.7	26.0	39.2	0.0	31.0	102.0	38.6	26.6	56.2	26.0	3.9
LnGrp LOS	E	C	C	D		C	F	D	C	E	F	A
Approach Vol, veh/h		542			491			2173			2551	
Approach Delay, s/veh		41.0			33.7			40.3			25.8	
Approach LOS		D			C			D			C	

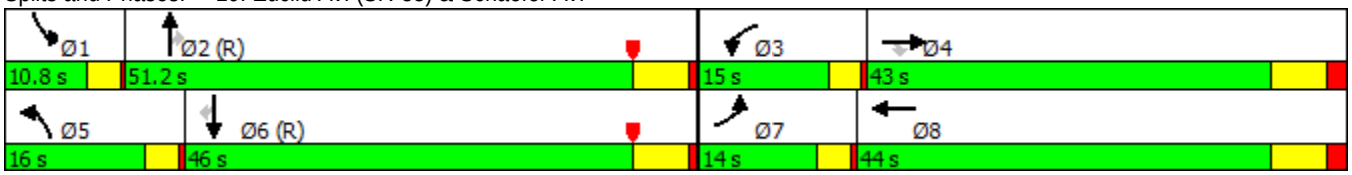
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.9	61.1		50.0	10.9	59.1		50.0
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	7.1	53.4		43.0	7.4	53.1		43.0
Max Q Clear Time (g_c+I1), s	6.2	42.2		44.4	8.5	55.1		28.8
Green Ext Time (p_c), s	0.0	11.1		0.0	0.0	0.0		4.5

Intersection Summary	
HCM 2010 Ctrl Delay	33.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	181	79	159	77	155	150	1442	27	40	2400	227
Future Volume (vph)	181	79	159	77	155	150	1442	27	40	2400	227
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	43.0	43.0	15.0	44.0	16.0	51.2	51.2	10.8	46.0	46.0
Total Split (%)	11.7%	35.8%	35.8%	12.5%	36.7%	13.3%	42.7%	42.7%	9.0%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	23.7	23.7	10.6	21.6	14.9	63.0	63.0	7.1	53.5	53.5
Actuated g/C Ratio	0.08	0.20	0.20	0.09	0.18	0.12	0.52	0.52	0.06	0.45	0.45
v/c Ratio	0.74	0.22	0.37	0.54	0.71	0.73	0.56	0.03	0.43	1.10	0.31
Control Delay	70.9	40.8	7.6	66.2	52.5	53.2	15.3	1.4	71.3	75.6	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	40.8	7.6	66.2	52.5	53.2	15.3	1.4	71.3	75.6	7.3
LOS	E	D	A	E	D	D	B	A	E	E	A
Approach Delay		41.2			56.0		18.6			69.8	
Approach LOS		D			E		B			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 38 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 50.0	Intersection LOS: D
Intersection Capacity Utilization 91.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	79	159	77	155	72	150	1442	27	40	2400	227
Future Volume (veh/h)	181	79	159	77	155	72	150	1442	27	40	2400	227
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1872	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	193	84	117	82	165	75	160	1534	24	43	2553	193
Adj No. of Lanes	2	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	243	301	256	134	197	89	186	2932	913	54	2557	777
Arrive On Green	0.08	0.16	0.16	0.08	0.16	0.16	0.03	0.19	0.19	0.03	0.49	0.49
Sat Flow, veh/h	3141	1900	1615	1714	1238	563	1783	5187	1615	1714	5187	1577
Grp Volume(v), veh/h	193	84	117	82	0	240	160	1534	24	43	2553	193
Grp Sat Flow(s),veh/h/ln	1570	1900	1615	1714	0	1801	1783	1729	1615	1714	1729	1577
Q Serve(g_s), s	7.2	4.7	7.9	5.6	0.0	15.5	10.7	32.0	1.5	3.0	59.0	8.5
Cycle Q Clear(g_c), s	7.2	4.7	7.9	5.6	0.0	15.5	10.7	32.0	1.5	3.0	59.0	8.5
Prop In Lane	1.00		1.00	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	243	301	256	134	0	286	186	2932	913	54	2557	777
V/C Ratio(X)	0.79	0.28	0.46	0.61	0.00	0.84	0.86	0.52	0.03	0.79	1.00	0.25
Avail Cap(c_a), veh/h	275	570	484	164	0	555	186	2932	913	104	2557	777
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.48	0.48	0.48	0.27	0.27	0.27
Uniform Delay (d), s/veh	54.4	44.5	45.8	53.6	0.0	49.0	57.1	34.2	21.8	57.7	30.4	17.6
Incr Delay (d2), s/veh	11.5	0.4	0.9	1.7	0.0	4.9	17.1	0.3	0.0	2.7	9.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	2.5	3.6	2.7	0.0	8.1	6.2	15.5	0.7	1.5	30.0	3.7
LnGrp Delay(d),s/veh	66.0	44.8	46.8	55.3	0.0	53.9	74.1	34.5	21.8	60.4	39.4	17.8
LnGrp LOS	E	D	D	E		D	E	C	C	E	D	B
Approach Vol, veh/h		394			322			1718			2789	
Approach Delay, s/veh		55.8			54.2			38.1			38.2	
Approach LOS		E			D			D			D	

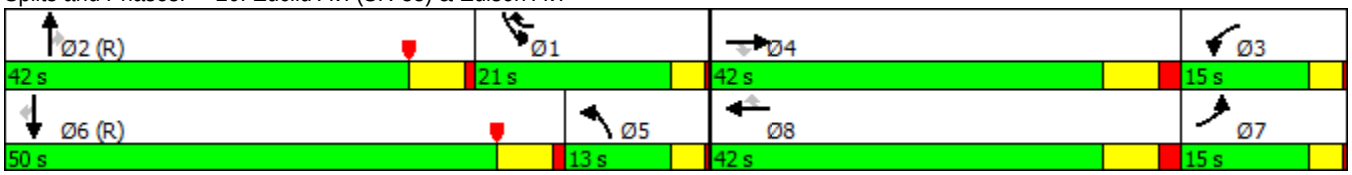
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	73.8	12.8	26.0	16.0	65.1	12.8	26.1
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	7.3	45.2	11.5	36.0	12.5	40.0	10.5	37.0
Max Q Clear Time (g_c+I1), s	5.0	34.0	7.6	9.9	12.7	61.0	9.2	17.5
Green Ext Time (p_c), s	0.0	11.0	0.0	1.6	0.0	0.0	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	40.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	579	300	273	655	367	309	1191	81	363	2098	322
Future Volume (vph)	401	579	300	273	655	367	309	1191	81	363	2098	322
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	8.5	42.0	8.5	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	15.0	42.0	42.0	15.0	42.0	21.0	13.0	42.0	42.0	21.0	50.0	50.0
Total Split (%)	12.5%	35.0%	35.0%	12.5%	35.0%	17.5%	10.8%	35.0%	35.0%	17.5%	41.7%	41.7%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	18.2	27.2	27.2	19.3	28.3	51.9	9.5	33.4	33.4	20.1	44.0	44.0
Actuated g/C Ratio	0.15	0.23	0.23	0.16	0.24	0.43	0.08	0.28	0.28	0.17	0.37	0.37
v/c Ratio	0.85	0.72	0.63	0.56	0.78	0.54	1.29	0.77	0.15	0.71	1.03	0.46
Control Delay	66.5	47.3	23.0	52.5	49.0	22.1	204.3	41.9	3.4	44.8	41.8	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	47.3	23.0	52.5	49.0	22.1	204.3	41.9	3.4	44.8	41.8	4.3
LOS	E	D	C	D	D	C	F	D	A	D	D	A
Approach Delay		47.6			42.1			71.7			37.9	
Approach LOS		D			D			E			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.29	
Intersection Signal Delay: 48.2	Intersection LOS: D
Intersection Capacity Utilization 99.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	579	300	273	655	367	309	1191	81	363	2098	322
Future Volume (veh/h)	401	579	300	273	655	367	309	1191	81	363	2098	322
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1768	1900	1900	1700	1900	1900	1700	1976	1900	1700	1976	1900
Adj Flow Rate, veh/h	427	616	159	290	697	230	329	1267	71	386	2232	237
Adj No. of Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	323	773	328	382	858	783	470	1496	408	840	2174	592
Arrive On Green	0.10	0.20	0.20	0.12	0.23	0.23	0.29	0.50	0.50	0.26	0.37	0.37
Sat Flow, veh/h	3368	3800	1615	3238	3800	1613	3238	5928	1615	3238	5928	1614
Grp Volume(v), veh/h	427	616	159	290	697	230	329	1267	71	386	2232	237
Grp Sat Flow(s),veh/h/ln	1684	1900	1615	1619	1900	1613	1619	1976	1615	1619	1976	1614
Q Serve(g_s), s	11.5	18.5	10.4	10.4	20.9	0.0	10.9	22.2	2.9	12.0	44.0	13.1
Cycle Q Clear(g_c), s	11.5	18.5	10.4	10.4	20.9	0.0	10.9	22.2	2.9	12.0	44.0	13.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	773	328	382	858	783	470	1496	408	840	2174	592
V/C Ratio(X)	1.32	0.80	0.48	0.76	0.81	0.29	0.70	0.85	0.17	0.46	1.03	0.40
Avail Cap(c_a), veh/h	323	1108	471	382	1108	889	470	1778	484	840	2174	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.88	0.88	0.09	0.09	0.09
Uniform Delay (d), s/veh	54.3	45.4	42.2	51.3	44.1	18.5	40.3	27.7	22.9	37.4	38.0	28.2
Incr Delay (d2), s/veh	165.5	2.7	1.1	7.7	3.7	0.2	3.4	5.4	0.8	0.0	14.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	10.0	4.8	5.1	11.4	4.5	5.1	12.7	1.3	5.4	26.9	5.8
LnGrp Delay(d),s/veh	219.7	48.1	43.3	58.9	47.7	18.8	43.7	33.1	23.7	37.4	52.5	28.4
LnGrp LOS	F	D	D	E	D	B	D	C	C	D	F	C
Approach Vol, veh/h		1202			1217			1667			2855	
Approach Delay, s/veh		108.5			44.9			34.8			48.4	
Approach LOS		F			D			C			D	

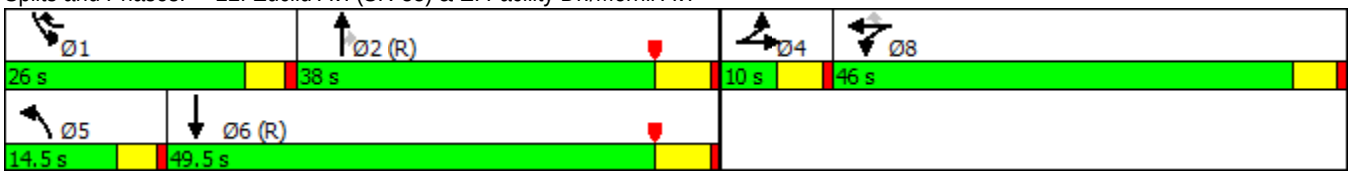
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.6	36.3	17.7	31.4	20.9	50.0	15.0	34.1
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	17.5	36.0	11.5	35.0	9.5	44.0	11.5	35.0
Max Q Clear Time (g_c+I1), s	14.0	24.2	12.4	20.5	12.9	46.0	13.5	22.9
Green Ext Time (p_c), s	0.6	6.1	0.0	3.7	0.0	0.0	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	54.9
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	8	62	465	25	1153	159	473	2350
Future Volume (vph)	8	62	465	25	1153	159	473	2350
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	26.0	14.5	38.0	38.0	26.0	49.5
Total Split (%)	8.3%	38.3%	21.7%	12.1%	31.7%	31.7%	21.7%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	26.4	48.6	10.0	50.4	50.4	21.7	67.9
Actuated g/C Ratio	0.04	0.22	0.40	0.08	0.42	0.42	0.18	0.57
v/c Ratio	0.29	0.76	0.68	0.18	0.53	0.22	0.84	0.86
Control Delay	56.2	55.3	23.4	72.3	22.5	3.6	66.9	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	55.3	23.4	72.3	22.5	3.6	66.9	13.5
LOS	E	E	C	E	C	A	E	B
Approach Delay	56.2	35.8			21.2			22.2
Approach LOS	E	D			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 80 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 24.2	Intersection LOS: C
Intersection Capacity Utilization 91.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	8	5	231	62	465	25	1153	159	473	2350	56
Future Volume (veh/h)	10	8	5	231	62	465	25	1153	159	473	2350	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1976	1900	1768	1900	1900
Adj Flow Rate, veh/h	10	8	4	241	65	276	26	1201	140	493	2448	55
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	18	14	7	278	75	576	83	2417	723	544	2956	66
Arrive On Green	0.02	0.02	0.02	0.19	0.19	0.19	0.05	0.45	0.45	0.17	0.57	0.57
Sat Flow, veh/h	819	655	328	1440	388	1591	1714	5394	1615	3267	5221	117
Grp Volume(v), veh/h	22	0	0	306	0	276	26	1201	140	493	1618	885
Grp Sat Flow(s),veh/h/ln	1801	0	0	1828	0	1591	1714	1798	1615	1633	1729	1879
Q Serve(g_s), s	1.5	0.0	0.0	19.5	0.0	16.1	1.8	19.0	6.3	17.8	45.8	46.3
Cycle Q Clear(g_c), s	1.5	0.0	0.0	19.5	0.0	16.1	1.8	19.0	6.3	17.8	45.8	46.3
Prop In Lane	0.45		0.18	0.79		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	39	0	0	353	0	576	83	2417	723	544	1958	1064
V/C Ratio(X)	0.56	0.00	0.00	0.87	0.00	0.48	0.31	0.50	0.19	0.91	0.83	0.83
Avail Cap(c_a), veh/h	75	0	0	625	0	813	143	2417	723	585	1958	1064
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.90	0.90	0.90	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.1	0.0	0.0	46.9	0.0	29.8	55.2	23.5	20.0	49.1	21.2	21.3
Incr Delay (d2), s/veh	4.7	0.0	0.0	2.6	0.0	0.2	0.7	0.7	0.5	16.3	4.2	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	10.1	0.0	7.1	0.9	9.6	2.9	9.2	22.9	26.1
LnGrp Delay(d),s/veh	62.8	0.0	0.0	49.5	0.0	30.0	55.9	24.2	20.6	65.4	25.4	28.9
LnGrp LOS	E			D		C	E	C	C	E	C	C
Approach Vol, veh/h		22			582			1367			2996	
Approach Delay, s/veh		62.8			40.3			24.4			33.0	
Approach LOS		E			D			C			C	

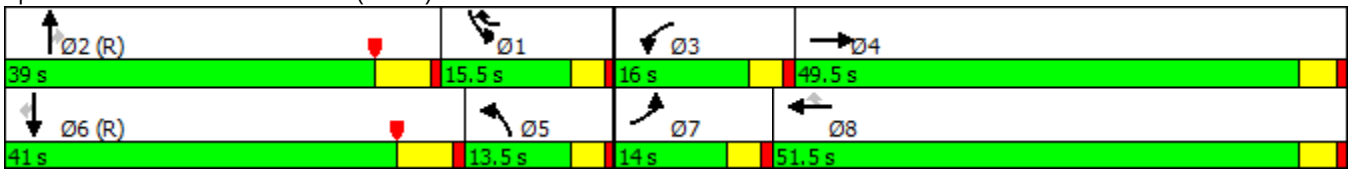
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	24.5	59.8		7.6	10.3	74.0		28.2
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	21.5	32.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	19.8	21.0		3.5	3.8	48.3		21.5
Green Ext Time (p_c), s	0.2	10.6		0.0	0.0	0.0		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	31.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	131	397	272	366	282	124	749	218	560	1479	212
Future Volume (vph)	131	397	272	366	282	124	749	218	560	1479	212
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	3	8	1	5	2		1	6	
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	9.0	45.5	9.0	9.0	36.0	36.0	9.0	33.0	33.0
Total Split (s)	14.0	49.5	16.0	51.5	15.5	13.5	39.0	39.0	15.5	41.0	41.0
Total Split (%)	11.7%	41.3%	13.3%	42.9%	12.9%	11.3%	32.5%	32.5%	12.9%	34.2%	34.2%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	10.0	26.9	11.7	28.6	52.1	9.5	39.9	39.9	23.0	53.4	53.4
Actuated g/C Ratio	0.08	0.22	0.10	0.24	0.43	0.08	0.33	0.33	0.19	0.44	0.44
v/c Ratio	0.51	0.68	0.83	0.43	0.39	0.94	0.44	0.32	0.95	0.65	0.26
Control Delay	72.6	36.6	74.5	39.0	11.9	118.4	33.2	5.7	52.8	18.2	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.6	36.6	74.5	39.0	11.9	118.4	33.2	5.7	52.8	18.2	2.3
LOS	E	D	E	D	B	F	C	A	D	B	A
Approach Delay		43.6		41.2			37.4			25.3	
Approach LOS		D		D			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 12 (10%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 33.5	Intersection LOS: C
Intersection Capacity Utilization 75.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	397	150	272	366	282	124	749	218	560	1479	212
Future Volume (veh/h)	131	397	150	272	366	282	124	749	218	560	1479	212
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1872	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	134	405	151	278	373	266	127	764	214	571	1509	178
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	259	515	190	332	769	920	444	1005	313	1121	1513	465
Arrive On Green	0.16	0.40	0.40	0.10	0.21	0.21	0.26	0.19	0.19	0.36	0.29	0.29
Sat Flow, veh/h	3141	2584	953	3459	3610	1615	1714	5187	1615	3141	5187	1594
Grp Volume(v), veh/h	134	281	275	278	373	266	127	764	214	571	1509	178
Grp Sat Flow(s),veh/h/ln	1570	1805	1732	1729	1805	1615	1714	1729	1615	1570	1729	1594
Q Serve(g_s), s	4.7	16.4	16.7	9.5	10.9	2.7	7.1	16.7	11.5	17.1	34.9	8.2
Cycle Q Clear(g_c), s	4.7	16.4	16.7	9.5	10.9	2.7	7.1	16.7	11.5	17.1	34.9	8.2
Prop In Lane	1.00		0.55	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	360	345	332	769	920	444	1005	313	1121	1513	465
V/C Ratio(X)	0.52	0.78	0.80	0.84	0.49	0.29	0.29	0.76	0.68	0.51	1.00	0.38
Avail Cap(c_a), veh/h	262	677	649	346	1414	1209	444	1426	444	1121	1513	465
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	1.00	0.90	0.90	0.90	0.40	0.40	0.40
Uniform Delay (d), s/veh	47.9	33.8	33.9	53.3	41.5	5.2	35.6	45.7	27.2	30.3	42.5	19.9
Incr Delay (d2), s/veh	0.5	2.5	2.9	14.9	0.2	0.1	0.1	4.9	10.4	0.1	14.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	8.4	8.2	5.2	5.5	2.5	3.4	8.4	6.0	7.5	18.6	3.7
LnGrp Delay(d),s/veh	48.5	36.3	36.8	68.2	41.6	5.3	35.7	50.6	37.6	30.4	56.5	20.8
LnGrp LOS	D	D	D	E	D	A	D	D	D	C	E	C
Approach Vol, veh/h		690			917			1105			2258	
Approach Delay, s/veh		38.9			39.1			46.4			47.1	
Approach LOS		D			D			D			D	

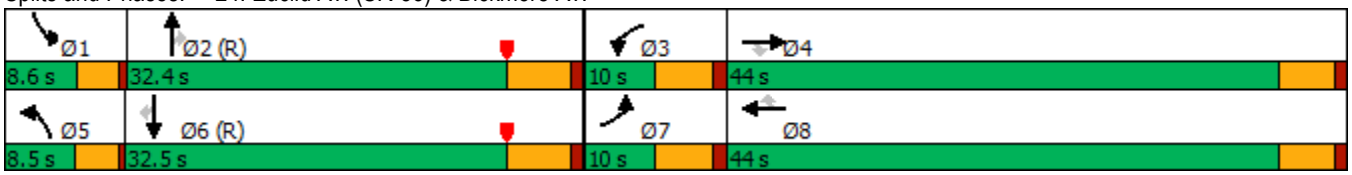
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	46.8	29.2	15.5	28.4	35.1	41.0	13.9	30.1
Change Period (Y+Rc), s	4.0	6.0	4.0	4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	11.5	33.0	12.0	45.0	9.5	35.0	10.0	47.0
Max Q Clear Time (g_c+I1), s	19.1	18.7	11.5	18.7	9.1	36.9	6.7	12.9
Green Ext Time (p_c), s	0.0	4.5	0.0	5.2	0.0	0.0	0.1	5.4

Intersection Summary	
HCM 2010 Ctrl Delay	44.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	11	21	70	28	63	48	997	181	111	1629	115
Future Volume (vph)	29	11	21	70	28	63	48	997	181	111	1629	115
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	44.0	44.0	10.0	44.0	44.0	8.5	26.5	26.5	8.5	30.5	30.5
Total Split (s)	10.0	44.0	44.0	10.0	44.0	44.0	8.5	32.4	32.4	8.6	32.5	32.5
Total Split (%)	10.5%	46.3%	46.3%	10.5%	46.3%	46.3%	8.9%	34.1%	34.1%	9.1%	34.2%	34.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	5.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	5.0	12.3	12.3	5.0	12.3	12.3	6.5	57.8	57.8	6.9	61.0	61.0
Actuated g/C Ratio	0.05	0.13	0.13	0.05	0.13	0.13	0.07	0.61	0.61	0.07	0.64	0.64
v/c Ratio	0.34	0.05	0.07	0.43	0.12	0.21	0.44	0.34	0.18	0.49	0.52	0.11
Control Delay	54.2	29.1	0.4	51.4	32.0	1.8	55.4	13.6	3.8	50.3	16.3	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.2	29.1	0.4	51.4	32.0	1.8	55.4	13.6	3.8	50.3	16.3	4.5
LOS	D	C	A	D	C	A	E	B	A	D	B	A
Approach Delay		31.4			28.6			13.8			17.6	
Approach LOS		C			C			B			B	

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 8.6 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 17.0	Intersection LOS: B
Intersection Capacity Utilization 56.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	11	21	70	28	63	48	997	181	111	1629	115
Future Volume (veh/h)	29	11	21	70	28	63	48	997	181	111	1629	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	31	12	20	74	30	54	51	1061	192	118	1733	113
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	2	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	88	111	94	174	113	96	67	3298	1027	178	3373	1050
Arrive On Green	0.05	0.06	0.06	0.05	0.06	0.06	0.04	0.64	0.64	0.05	0.65	0.65
Sat Flow, veh/h	1714	1900	1607	3326	1900	1615	1714	5187	1615	3326	5187	1615
Grp Volume(v), veh/h	31	12	20	74	30	54	51	1061	192	118	1733	113
Grp Sat Flow(s),veh/h/ln	1714	1900	1607	1663	1900	1615	1714	1729	1615	1663	1729	1615
Q Serve(g_s), s	1.7	0.6	1.1	2.0	1.4	3.1	2.8	8.9	4.7	3.3	16.7	2.5
Cycle Q Clear(g_c), s	1.7	0.6	1.1	2.0	1.4	3.1	2.8	8.9	4.7	3.3	16.7	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	88	111	94	174	113	96	67	3298	1027	178	3373	1050
V/C Ratio(X)	0.35	0.11	0.21	0.43	0.26	0.56	0.76	0.32	0.19	0.66	0.51	0.11
Avail Cap(c_a), veh/h	90	780	660	175	780	663	90	3298	1027	179	3373	1050
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.85	0.85	0.67	0.67	0.67
Uniform Delay (d), s/veh	43.5	42.4	42.6	43.6	42.7	43.5	45.2	7.9	7.2	44.1	8.7	6.2
Incr Delay (d2), s/veh	0.9	0.2	0.4	0.6	0.5	1.9	13.3	0.2	0.3	4.9	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.3	0.5	1.0	0.8	1.4	1.6	4.3	2.2	1.6	8.0	1.1
LnGrp Delay(d),s/veh	44.4	42.5	43.0	44.2	43.1	45.4	58.5	8.1	7.5	49.1	9.1	6.4
LnGrp LOS	D	D	D	D	D	D	E	A	A	D	A	A
Approach Vol, veh/h		63			158			1304			1964	
Approach Delay, s/veh		43.6			44.4			10.0			11.4	
Approach LOS		D			D			B			B	

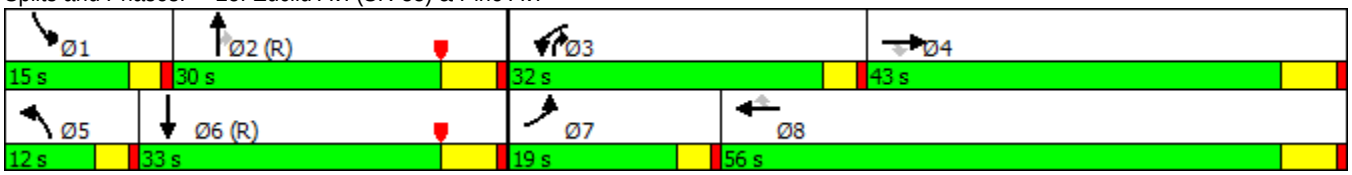
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	65.9	10.0	10.6	7.2	67.3	9.9	10.7
Change Period (Y+Rc), s	3.5	5.5	5.0	5.0	3.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	5.1	26.9	5.0	39.0	5.0	27.0	5.0	39.0
Max Q Clear Time (g_c+I1), s	5.3	10.9	4.0	3.1	4.8	18.7	3.7	5.1
Green Ext Time (p_c), s	0.0	4.2	0.0	0.0	0.0	4.9	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	80	329	199	705	418	227	186	884	518	255	1372
Future Volume (vph)	80	329	199	705	418	227	186	884	518	255	1372
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	19.0	43.0	43.0	32.0	56.0	56.0	12.0	30.0	32.0	15.0	33.0
Total Split (%)	15.8%	35.8%	35.8%	26.7%	46.7%	46.7%	10.0%	25.0%	26.7%	12.5%	27.5%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	10.1	20.9	20.9	27.6	40.4	40.4	11.1	37.8	67.4	13.6	40.4
Actuated g/C Ratio	0.08	0.17	0.17	0.23	0.34	0.34	0.09	0.32	0.56	0.11	0.34
v/c Ratio	0.57	0.53	0.48	0.96	0.35	0.33	0.65	0.55	0.51	0.73	0.86
Control Delay	67.2	46.9	13.4	69.5	30.6	4.4	53.8	35.3	9.3	63.9	43.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	46.9	13.4	69.5	30.6	4.4	53.8	35.3	9.3	63.9	43.8
LOS	E	D	B	E	C	A	D	D	A	E	D
Approach Delay		38.6			46.5			29.0			46.7
Approach LOS		D			D			C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 9 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 40.4	Intersection LOS: D
Intersection Capacity Utilization 82.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	329	199	705	418	227	186	884	518	255	1372	94
Future Volume (veh/h)	80	329	199	705	418	227	186	884	518	255	1372	94
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1768	1900	1900	1700	1900	1976	1700	1900	1900
Adj Flow Rate, veh/h	81	332	0	712	422	214	188	893	345	258	1386	90
Adj No. of Lanes	1	2	1	2	2	1	2	3	1	2	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	102	607	271	756	1228	542	209	1775	956	288	1826	119
Arrive On Green	0.06	0.17	0.00	0.23	0.34	0.34	0.07	0.34	0.34	0.09	0.37	0.37
Sat Flow, veh/h	1714	3610	1615	3267	3610	1595	3141	5187	1657	3141	4973	323
Grp Volume(v), veh/h	81	332	0	712	422	214	188	893	345	258	964	512
Grp Sat Flow(s),veh/h/ln	1714	1805	1615	1633	1805	1595	1570	1729	1657	1570	1729	1838
Q Serve(g_s), s	5.6	10.1	0.0	25.7	10.5	12.3	7.1	16.4	13.5	9.8	29.3	29.3
Cycle Q Clear(g_c), s	5.6	10.1	0.0	25.7	10.5	12.3	7.1	16.4	13.5	9.8	29.3	29.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	102	607	271	756	1228	542	209	1775	956	288	1270	675
V/C Ratio(X)	0.80	0.55	0.00	0.94	0.34	0.39	0.90	0.50	0.36	0.90	0.76	0.76
Avail Cap(c_a), veh/h	214	1113	498	762	1504	664	209	1775	956	288	1270	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	0.09	0.09	0.09	0.85	0.85	0.85
Uniform Delay (d), s/veh	55.7	45.7	0.0	45.3	29.6	30.2	55.6	31.4	13.8	53.9	33.3	33.3
Incr Delay (d2), s/veh	5.2	1.1	0.0	19.4	0.2	0.7	5.0	0.1	0.1	24.3	3.7	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	5.1	0.0	13.6	5.3	5.5	3.3	7.9	6.2	5.2	14.6	16.1
LnGrp Delay(d),s/veh	61.0	46.8	0.0	64.7	29.8	30.8	60.6	31.5	13.9	78.2	37.0	40.0
LnGrp LOS	E	D		E	C	C	E	C	B	E	D	D
Approach Vol, veh/h		413			1348			1426			1734	
Approach Delay, s/veh		49.6			48.4			31.0			44.0	
Approach LOS		D			D			C			D	

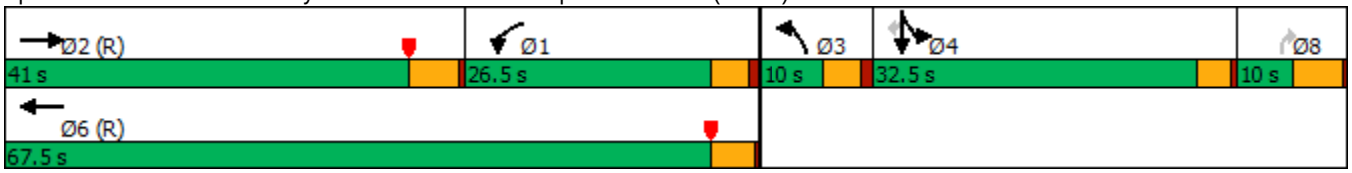
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	47.1	31.8	26.2	12.0	50.1	11.1	46.8
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	24.0	28.0	37.0	8.0	27.0	15.0	50.0
Max Q Clear Time (g_c+I1), s	11.8	18.4	27.7	12.1	9.1	31.3	7.6	14.3
Green Ext Time (p_c), s	0.0	4.3	0.1	8.0	0.0	0.0	0.0	9.0

Intersection Summary	
HCM 2010 Ctrl Delay	41.9
HCM 2010 LOS	D

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	1049	454	678	71	241	276	24	64
Future Volume (vph)	1049	454	678	71	241	276	24	64
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	41.0	26.5	67.5	10.0	10.0	32.5	32.5	32.5
Total Split (%)	34.2%	22.1%	56.3%	8.3%	8.3%	27.1%	27.1%	27.1%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lead	Lag		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	45.6	22.0	72.6	5.5	6.5	18.0	18.0	18.0
Actuated g/C Ratio	0.38	0.18	0.60	0.05	0.05	0.15	0.15	0.15
v/c Ratio	0.86	1.59	0.34	1.00	0.78	0.61	0.09	0.19
Control Delay	42.7	305.8	8.3	159.5	23.5	52.3	41.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	305.8	8.3	159.5	23.5	52.3	41.5	1.2
LOS	D	F	A	F	C	D	D	A
Approach Delay	42.7		127.7				42.6	
Approach LOS	D		F				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 34 (28%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.59	
Intersection Signal Delay: 77.4	Intersection LOS: E
Intersection Capacity Utilization 79.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1049	19	454	678	0	71	0	241	276	24	64
Future Volume (veh/h)	0	1049	19	454	678	0	71	0	241	276	24	64
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0	1800	0	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	1153	21	499	745	0	78	0	265	303	26	70
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1088	20	816	2952	0	0	0	0	384	220	187
Arrive On Green	0.00	0.30	0.30	0.95	1.00	0.00	0.00	0.00	0.00	0.12	0.12	0.12
Sat Flow, veh/h	0	3722	66	1714	3705	0		0		3326	1900	1615
Grp Volume(v), veh/h	0	574	600	499	745	0		0.0		303	26	70
Grp Sat Flow(s),veh/h/ln	0	1805	1888	1714	1805	0				1663	1900	1615
Q Serve(g_s), s	0.0	36.0	36.0	4.0	0.0	0.0				10.6	1.5	4.8
Cycle Q Clear(g_c), s	0.0	36.0	36.0	4.0	0.0	0.0				10.6	1.5	4.8
Prop In Lane	0.00		0.03	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	542	567	816	2952	0				384	220	187
V/C Ratio(X)	0.00	1.06	1.06	0.61	0.25	0.00				0.79	0.12	0.38
Avail Cap(c_a), veh/h	0	542	567	816	2952	0				804	459	390
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	42.0	42.0	1.6	0.0	0.0				51.6	47.6	49.1
Incr Delay (d2), s/veh	0.0	55.4	54.6	1.3	0.2	0.0				3.6	0.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	26.2	27.3	1.7	0.1	0.0				5.1	0.8	2.2
LnGrp Delay(d),s/veh	0.0	97.4	96.6	2.9	0.2	0.0				55.3	47.8	50.3
LnGrp LOS		F	F	A	A					E	D	D
Approach Vol, veh/h		1174			1244						399	
Approach Delay, s/veh		97.0			1.3						53.9	
Approach LOS		F			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	61.6	41.0		17.4		102.6		
Change Period (Y+Rc), s	4.5	5.0		3.5		4.5		
Max Green Setting (Gmax), s	22.0	36.0		29.0		63.0		
Max Q Clear Time (g_c+I1), s	6.0	38.0		12.6		2.0		
Green Ext Time (p_c), s	1.4	0.0		1.2		4.2		

Intersection Summary	
HCM 2010 Ctrl Delay	48.6
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1055	216	16	927	41	3
Future Volume (vph)	1055	216	16	927	41	3
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	24.2	24.2	9.6	24.2	32.1	32.1
Total Split (s)	55.9	55.9	12.0	67.9	32.1	32.1
Total Split (%)	55.9%	55.9%	12.0%	67.9%	32.1%	32.1%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	27.9	27.9	6.0	29.2	13.2	13.2
Actuated g/C Ratio	0.51	0.51	0.11	0.53	0.24	0.24
v/c Ratio	0.63	0.25	0.09	0.53	0.11	0.01
Control Delay	12.3	2.4	32.8	9.1	21.7	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	2.4	32.8	9.1	21.7	16.3
LOS	B	A	C	A	C	B
Approach Delay	10.6			9.4	21.4	
Approach LOS	B			A	C	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 55.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 46.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1055	216	16	927	41	3
Future Volume (veh/h)	1055	216	16	927	41	3
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1147	235	17	1008	45	3
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2047	916	35	2386	273	257
Arrive On Green	0.57	0.57	0.02	0.66	0.16	0.16
Sat Flow, veh/h	3705	1615	1714	3705	1714	1615
Grp Volume(v), veh/h	1147	235	17	1008	45	3
Grp Sat Flow(s),veh/h/ln	1805	1615	1714	1805	1714	1615
Q Serve(g_s), s	12.7	4.6	0.6	8.3	1.4	0.1
Cycle Q Clear(g_c), s	12.7	4.6	0.6	8.3	1.4	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2047	916	35	2386	273	257
V/C Ratio(X)	0.56	0.26	0.49	0.42	0.16	0.01
Avail Cap(c_a), veh/h	2857	1278	202	3547	737	694
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.6	6.9	30.4	5.0	22.8	22.2
Incr Delay (d2), s/veh	0.2	0.1	3.8	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	2.1	0.3	4.1	0.7	0.0
LnGrp Delay(d),s/veh	8.9	7.0	34.3	5.1	23.1	22.3
LnGrp LOS	A	A	C	A	C	C
Approach Vol, veh/h	1382			1025	48	
Approach Delay, s/veh	8.6			5.6	23.0	
Approach LOS	A			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.9	41.8				47.7		15.1
Change Period (Y+Rc), s	4.6	6.2				6.2		5.1
Max Green Setting (Gmax), s	7.4	49.7				61.7		27.0
Max Q Clear Time (g_c+I1), s	2.6	14.7				10.3		3.4
Green Ext Time (p_c), s	0.0	21.0				25.6		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	321	512	12	624	56	52	25	132	16
Future Volume (vph)	321	512	12	624	56	52	25	132	16
Turn Type	Prot	NA	Prot	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	24.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	38.8	9.6	25.4	25.4	31.6	31.6	31.6	31.6
Total Split (%)	28.8%	48.5%	12.0%	31.8%	31.8%	39.5%	39.5%	39.5%	39.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	16.8	37.0	5.1	17.2	17.2		21.7		21.7
Actuated g/C Ratio	0.23	0.52	0.07	0.24	0.24		0.30		0.30
v/c Ratio	0.84	0.32	0.11	0.76	0.12		0.27		0.80
Control Delay	48.4	11.9	37.3	32.7	0.5		21.6		38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	48.4	11.9	37.3	32.7	0.5		21.6		38.5
LOS	D	B	D	C	A		C		D
Approach Delay		25.3		30.1			21.6		38.5
Approach LOS		C		C			C		D

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 71.5
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 29.0 — Intersection LOS: C
Intersection Capacity Utilization 71.6% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	321	512	41	12	624	56	52	25	23	132	16	194
Future Volume (veh/h)	321	512	41	12	624	56	52	25	23	132	16	194
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	338	539	43	13	657	59	55	26	24	139	17	204
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	385	1574	125	28	928	405	253	119	85	230	40	250
Arrive On Green	0.22	0.47	0.47	0.02	0.26	0.26	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1714	3381	269	1714	3610	1577	606	433	308	548	147	908
Grp Volume(v), veh/h	338	287	295	13	657	59	105	0	0	360	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1845	1714	1805	1577	1346	0	0	1602	0	0
Q Serve(g_s), s	12.1	6.4	6.4	0.5	10.5	1.8	0.0	0.0	0.0	9.8	0.0	0.0
Cycle Q Clear(g_c), s	12.1	6.4	6.4	0.5	10.5	1.8	3.3	0.0	0.0	13.2	0.0	0.0
Prop In Lane	1.00		0.15	1.00		1.00	0.52		0.23	0.39		0.57
Lane Grp Cap(c), veh/h	385	840	859	28	928	405	457	0	0	520	0	0
V/C Ratio(X)	0.88	0.34	0.34	0.47	0.71	0.15	0.23	0.00	0.00	0.69	0.00	0.00
Avail Cap(c_a), veh/h	498	928	949	135	1093	478	674	0	0	754	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	23.7	10.8	10.8	30.9	21.4	18.2	17.7	0.0	0.0	21.3	0.0	0.0
Incr Delay (d2), s/veh	11.3	0.2	0.2	4.5	1.7	0.2	0.3	0.0	0.0	1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	3.2	3.3	0.3	5.4	0.8	1.5	0.0	0.0	6.0	0.0	0.0
LnGrp Delay(d),s/veh	35.1	11.0	11.0	35.5	23.1	18.3	18.0	0.0	0.0	22.9	0.0	0.0
LnGrp LOS	D	B	B	D	C	B	B			C		
Approach Vol, veh/h		920			729			105			360	
Approach Delay, s/veh		19.9			23.0			18.0			22.9	
Approach LOS		B			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	35.7		22.1	18.8	22.5		22.1
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	32.6		27.0	18.4	19.2		27.0
Max Q Clear Time (g_c+I1), s	2.5	8.4		15.2	14.1	12.5		5.3
Green Ext Time (p_c), s	0.0	7.9		2.2	0.2	3.8		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	21.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	319	745	12	888	279	52	25	207	16
Future Volume (vph)	319	745	12	888	279	52	25	207	16
Turn Type	Prot	NA	Prot	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	24.2	31.6	31.6	31.6	31.6
Total Split (s)	33.3	78.6	9.6	54.9	54.9	31.8	31.8	31.8	31.8
Total Split (%)	27.8%	65.5%	8.0%	45.8%	45.8%	26.5%	26.5%	26.5%	26.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2		4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	23.2	60.8	5.3	34.3	34.3		22.2	22.2	22.2
Actuated g/C Ratio	0.24	0.63	0.06	0.36	0.36		0.23	0.23	0.23
v/c Ratio	0.81	0.36	0.14	0.72	0.40		0.37	0.76	0.56
Control Delay	53.4	9.4	55.8	31.0	5.6		39.3	55.7	41.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	53.4	9.4	55.8	31.0	5.6		39.3	55.7	41.7
LOS	D	A	E	C	A		D	E	D
Approach Delay		22.1		25.2			39.3		48.8
Approach LOS		C		C			D		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 80.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	319	745	41	12	888	279	52	25	23	207	16	183
Future Volume (veh/h)	319	745	41	12	888	279	52	25	23	207	16	183
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	336	784	43	13	935	294	55	26	24	218	17	193
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	370	2037	112	26	1391	609	151	71	48	339	31	351
Arrive On Green	0.22	0.59	0.59	0.02	0.39	0.39	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1714	3476	191	1714	3610	1579	393	303	206	1375	132	1503
Grp Volume(v), veh/h	336	407	420	13	935	294	105	0	0	218	0	210
Grp Sat Flow(s),veh/h/ln	1714	1805	1861	1714	1805	1579	902	0	0	1375	0	1635
Q Serve(g_s), s	17.8	11.3	11.3	0.7	20.1	13.1	3.9	0.0	0.0	3.8	0.0	10.5
Cycle Q Clear(g_c), s	17.8	11.3	11.3	0.7	20.1	13.1	14.5	0.0	0.0	18.3	0.0	10.5
Prop In Lane	1.00		0.10	1.00		1.00	0.52		0.23	1.00		0.92
Lane Grp Cap(c), veh/h	370	1058	1091	26	1391	609	270	0	0	339	0	382
V/C Ratio(X)	0.91	0.38	0.38	0.49	0.67	0.48	0.39	0.00	0.00	0.64	0.00	0.55
Avail Cap(c_a), veh/h	527	1399	1443	92	1883	823	353	0	0	418	0	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.7	10.3	10.3	45.6	23.8	21.7	33.9	0.0	0.0	34.9	0.0	31.5
Incr Delay (d2), s/veh	12.3	0.2	0.2	5.3	0.6	0.6	0.9	0.0	0.0	2.3	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	5.6	5.8	0.4	10.1	5.8	2.6	0.0	0.0	5.6	0.0	4.9
LnGrp Delay(d),s/veh	48.0	10.6	10.6	50.9	24.4	22.3	34.8	0.0	0.0	37.3	0.0	32.7
LnGrp LOS	D	B	B	D	C	C	C			D		C
Approach Vol, veh/h		1163			1242			105			428	
Approach Delay, s/veh		21.4			24.2			34.8			35.0	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	60.9		26.4	24.8	42.2		26.4
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	72.4		27.2	28.7	48.7		27.2
Max Q Clear Time (g_c+I1), s	2.7	13.3		20.3	19.8	22.1		16.5
Green Ext Time (p_c), s	0.0	18.6		1.5	0.3	13.9		1.9

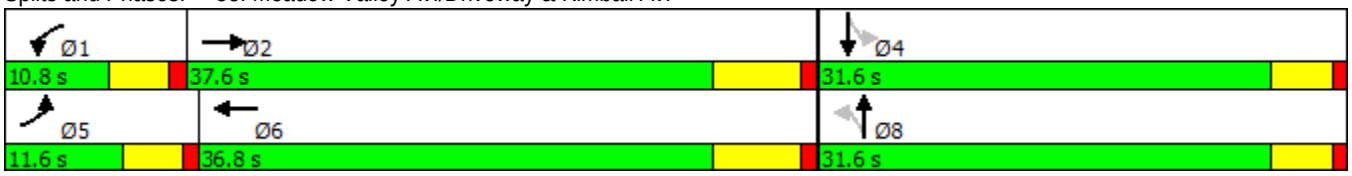
Intersection Summary	
HCM 2010 Ctrl Delay	25.0
HCM 2010 LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	109	538	33	596	79	0	2	0
Future Volume (vph)	109	538	33	596	79	0	2	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	31.6	31.6	31.6	31.6
Total Split (s)	11.6	37.6	10.8	36.8	31.6	31.6	31.6	31.6
Total Split (%)	14.5%	47.0%	13.5%	46.0%	39.5%	39.5%	39.5%	39.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.1	23.3	5.7	15.3		12.8		12.8
Actuated g/C Ratio	0.14	0.46	0.11	0.30		0.25		0.25
v/c Ratio	0.50	0.37	0.19	0.62		0.27		0.04
Control Delay	34.0	12.3	27.3	18.6		6.7		0.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	34.0	12.3	27.3	18.6		6.7		0.2
LOS	C	B	C	B		A		A
Approach Delay		15.8		19.0		6.7		0.2
Approach LOS		B		B		A		A

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 51.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 16.3 — Intersection LOS: B
Intersection Capacity Utilization 48.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 53: Meadow Valley Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	538	20	33	596	8	79	0	28	2	0	16
Future Volume (veh/h)	109	538	20	33	596	8	79	0	28	2	0	16
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	118	591	22	36	655	9	87	0	31	2	0	17
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	149	1396	52	69	1266	17	372	21	91	99	28	325
Arrive On Green	0.09	0.39	0.39	0.04	0.35	0.35	0.22	0.00	0.22	0.22	0.00	0.22
Sat Flow, veh/h	1714	3546	132	1714	3646	50	1045	95	406	47	124	1458
Grp Volume(v), veh/h	118	301	312	36	324	340	118	0	0	19	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1873	1714	1805	1891	1547	0	0	1629	0	0
Q Serve(g_s), s	3.0	5.4	5.4	0.9	6.4	6.4	2.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.0	5.4	5.4	0.9	6.4	6.4	2.8	0.0	0.0	0.4	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.03	0.74		0.26	0.11		0.89
Lane Grp Cap(c), veh/h	149	711	737	69	627	657	484	0	0	452	0	0
V/C Ratio(X)	0.79	0.42	0.42	0.52	0.52	0.52	0.24	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	267	1263	1311	237	1231	1290	1062	0	0	1058	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.1	9.9	9.9	21.1	11.7	11.7	14.6	0.0	0.0	13.7	0.0	0.0
Incr Delay (d2), s/veh	3.6	0.4	0.4	2.3	0.7	0.6	0.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.8	2.9	0.5	3.3	3.4	1.2	0.0	0.0	0.2	0.0	0.0
LnGrp Delay(d),s/veh	23.7	10.3	10.3	23.4	12.3	12.3	14.8	0.0	0.0	13.7	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	B			B		
Approach Vol, veh/h		731			700			118			19	
Approach Delay, s/veh		12.5			12.9			14.8			13.7	
Approach LOS		B			B			B			B	

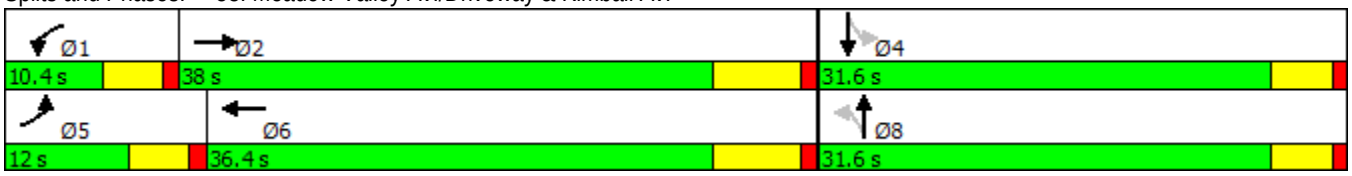
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.4	23.9		14.6	8.5	21.8		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	6.2	31.4		27.0	7.0	30.6		27.0
Max Q Clear Time (g_c+I1), s	2.9	7.4		2.4	5.0	8.4		4.8
Green Ext Time (p_c), s	0.0	7.3		0.8	0.0	7.2		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	12.8
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	109	846	33	1084	79	0	2	0
Future Volume (vph)	109	846	33	1084	79	0	2	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	31.6	31.6	31.6	31.6
Total Split (s)	12.0	38.0	10.4	36.4	31.6	31.6	31.6	31.6
Total Split (%)	15.0%	47.5%	13.0%	45.5%	39.5%	39.5%	39.5%	39.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.2	35.0	5.5	26.7		12.9		12.9
Actuated g/C Ratio	0.12	0.56	0.09	0.43		0.21		0.21
v/c Ratio	0.60	0.47	0.24	0.78		0.31		0.05
Control Delay	44.4	11.5	34.4	20.9		8.5		0.2
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	44.4	11.5	34.4	20.9		8.5		0.2
LOS	D	B	C	C		A		A
Approach Delay		15.2		21.3		8.5		0.2
Approach LOS		B		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 62.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 53: Meadow Valley Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	846	20	33	1084	8	79	0	28	2	0	16
Future Volume (veh/h)	109	846	20	33	1084	8	79	0	28	2	0	16
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	118	930	22	36	1191	9	87	0	31	2	0	17
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	149	1846	44	65	1702	13	296	17	72	79	22	258
Arrive On Green	0.09	0.51	0.51	0.04	0.46	0.46	0.18	0.00	0.18	0.18	0.00	0.18
Sat Flow, veh/h	1714	3603	85	1714	3672	28	1045	95	406	49	122	1457
Grp Volume(v), veh/h	118	466	486	36	585	615	118	0	0	19	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1883	1714	1805	1895	1547	0	0	1629	0	0
Q Serve(g_s), s	3.8	9.6	9.6	1.2	14.6	14.6	3.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.8	9.6	9.6	1.2	14.6	14.6	3.8	0.0	0.0	0.5	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.01	0.74		0.26	0.11		0.89
Lane Grp Cap(c), veh/h	149	925	965	65	837	878	384	0	0	359	0	0
V/C Ratio(X)	0.79	0.50	0.50	0.55	0.70	0.70	0.31	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	225	1016	1060	176	965	1013	844	0	0	840	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.3	9.1	9.1	26.7	12.0	12.0	20.6	0.0	0.0	19.4	0.0	0.0
Incr Delay (d2), s/veh	5.5	0.4	0.4	2.7	1.9	1.8	0.4	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.8	5.0	0.6	7.6	8.0	1.7	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	30.8	9.5	9.5	29.4	13.9	13.8	21.1	0.0	0.0	19.4	0.0	0.0
LnGrp LOS	C	A	A	C	B	B	C			B		
Approach Vol, veh/h		1070			1236			118			19	
Approach Delay, s/veh		11.8			14.3			21.1			19.4	
Approach LOS		B			B			C			B	

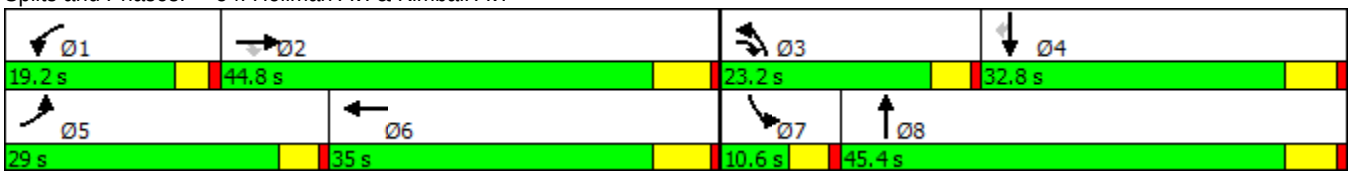
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	35.1		14.6	9.5	32.4		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.8	31.8		27.0	7.4	30.2		27.0
Max Q Clear Time (g_c+I1), s	3.2	11.6		2.5	5.8	16.6		5.8
Green Ext Time (p_c), s	0.0	12.7		0.8	0.0	9.6		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	13.6
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	256	175	137	99	261	190	521	21	135	186
Future Volume (vph)	256	175	137	99	261	190	521	21	135	186
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	3	1	6	3	8	7	4	
Permitted Phases			2							4
Detector Phase	5	2	3	1	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	9.5	33.2	9.6	32.8	9.6	32.8	32.8
Total Split (s)	29.0	44.8	23.2	19.2	35.0	23.2	45.4	10.6	32.8	32.8
Total Split (%)	24.2%	37.3%	19.3%	16.0%	29.2%	19.3%	37.8%	8.8%	27.3%	27.3%
Yellow Time (s)	3.6	5.2	3.6	3.0	5.2	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	4.0	6.2	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	19.4	34.3	56.2	10.4	21.8	15.4	31.3	5.7	14.5	14.5
Actuated g/C Ratio	0.21	0.37	0.60	0.11	0.23	0.16	0.34	0.06	0.16	0.16
v/c Ratio	0.77	0.27	0.14	0.56	0.76	0.73	0.60	0.22	0.26	0.48
Control Delay	53.3	25.6	2.5	55.6	47.0	56.3	29.2	55.3	38.3	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	25.6	2.5	55.6	47.0	56.3	29.2	55.3	38.3	9.6
LOS	D	C	A	E	D	E	C	E	D	A
Approach Delay		32.5			49.0		35.2		23.7	
Approach LOS		C			D		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 93.4	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 35.3	Intersection LOS: D
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	175	137	99	261	50	190	521	148	21	135	186
Future Volume (veh/h)	256	175	137	99	261	50	190	521	148	21	135	186
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	275	188	147	106	281	54	204	560	159	23	145	200
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	313	642	773	134	351	67	241	871	247	42	714	319
Arrive On Green	0.18	0.34	0.34	0.08	0.23	0.23	0.14	0.31	0.31	0.02	0.20	0.20
Sat Flow, veh/h	1714	1900	1615	1714	1550	298	1714	2780	787	1714	3610	1615
Grp Volume(v), veh/h	275	188	147	106	0	335	204	363	356	23	145	200
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1714	0	1847	1714	1805	1761	1714	1805	1615
Q Serve(g_s), s	13.1	6.1	4.4	5.1	0.0	14.4	9.7	14.5	14.6	1.1	2.8	9.5
Cycle Q Clear(g_c), s	13.1	6.1	4.4	5.1	0.0	14.4	9.7	14.5	14.6	1.1	2.8	9.5
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	313	642	773	134	0	418	241	566	552	42	714	319
V/C Ratio(X)	0.88	0.29	0.19	0.79	0.00	0.80	0.85	0.64	0.64	0.54	0.20	0.63
Avail Cap(c_a), veh/h	498	874	970	311	0	634	380	852	831	123	1162	520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	20.4	12.5	38.0	0.0	30.7	35.2	24.8	24.8	40.4	28.1	30.8
Incr Delay (d2), s/veh	6.5	0.3	0.1	3.9	0.0	4.3	5.7	1.2	1.3	4.0	0.1	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	3.2	2.0	2.6	0.0	7.9	5.0	7.4	7.3	0.6	1.4	4.4
LnGrp Delay(d),s/veh	39.8	20.6	12.7	41.9	0.0	35.0	40.8	26.0	26.1	44.4	28.3	32.8
LnGrp LOS	D	C	B	D		C	D	C	C	D	C	C
Approach Vol, veh/h		610			441			923			368	
Approach Delay, s/veh		27.4			36.6			29.3			31.8	
Approach LOS		C			D			C			C	

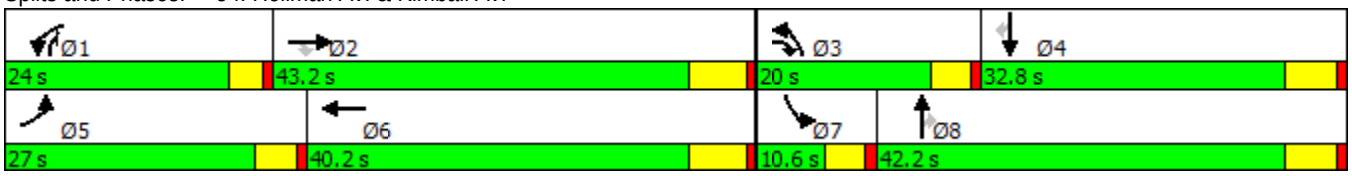
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	34.6	16.4	22.4	19.9	25.2	6.7	32.1
Change Period (Y+Rc), s	4.0	6.2	4.6	5.8	4.6	6.2	4.6	5.8
Max Green Setting (Gmax), s	15.2	38.6	18.6	27.0	24.4	28.8	6.0	39.6
Max Q Clear Time (g_c+I1), s	7.1	8.1	11.7	11.5	15.1	16.4	3.1	16.6
Green Ext Time (p_c), s	0.1	3.4	0.1	5.1	0.3	2.6	0.0	5.9

Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	256	487	133	331	770	168	521	298	21	135	186
Future Volume (vph)	256	487	133	331	770	168	521	298	21	135	186
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2	3	1	6	3	8	1	7	4	
Permitted Phases			2					8			4
Detector Phase	5	2	3	1	6	3	8	1	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	9.5	33.2	9.6	32.8	9.5	9.6	32.8	32.8
Total Split (s)	27.0	43.2	20.0	24.0	40.2	20.0	42.2	24.0	10.6	32.8	32.8
Total Split (%)	22.5%	36.0%	16.7%	20.0%	33.5%	16.7%	35.2%	20.0%	8.8%	27.3%	27.3%
Yellow Time (s)	3.6	5.2	3.6	3.0	5.2	3.6	4.8	3.0	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	4.0	6.2	4.6	5.8	4.0	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min	Min
Act Effct Green (s)	20.0	35.5	55.9	15.1	30.0	14.1	29.1	50.1	5.6	14.0	14.0
Actuated g/C Ratio	0.20	0.36	0.56	0.15	0.30	0.14	0.29	0.50	0.06	0.14	0.14
v/c Ratio	0.80	0.41	0.15	0.71	0.82	0.75	0.53	0.35	0.24	0.29	0.50
Control Delay	58.6	26.7	2.9	50.2	40.4	64.1	33.6	7.9	57.1	41.1	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	26.7	2.9	50.2	40.4	64.1	33.6	7.9	57.1	41.1	10.2
LOS	E	C	A	D	D	E	C	A	E	D	B
Approach Delay		32.4			43.2		31.0			25.3	
Approach LOS		C			D		C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 99.8	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 35.0	Intersection LOS: C
Intersection Capacity Utilization 74.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	487	133	331	770	50	168	521	298	21	135	186
Future Volume (veh/h)	256	487	133	331	770	50	168	521	298	21	135	186
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	275	524	143	356	828	54	181	560	320	23	145	200
Adj No. of Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	306	1282	773	428	1029	67	211	1034	670	40	674	301
Arrive On Green	0.18	0.36	0.36	0.13	0.30	0.30	0.12	0.29	0.29	0.02	0.19	0.19
Sat Flow, veh/h	1714	3610	1615	3326	3441	224	1714	3610	1615	1714	3610	1615
Grp Volume(v), veh/h	275	524	143	356	434	448	181	560	320	23	145	200
Grp Sat Flow(s),veh/h/ln	1714	1805	1615	1663	1805	1860	1714	1805	1615	1714	1805	1615
Q Serve(g_s), s	15.7	10.9	5.1	10.4	22.2	22.2	10.3	13.1	14.4	1.3	3.4	11.5
Cycle Q Clear(g_c), s	15.7	10.9	5.1	10.4	22.2	22.2	10.3	13.1	14.4	1.3	3.4	11.5
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	306	1282	773	428	540	556	211	1034	670	40	674	301
V/C Ratio(X)	0.90	0.41	0.19	0.83	0.80	0.80	0.86	0.54	0.48	0.57	0.22	0.66
Avail Cap(c_a), veh/h	384	1337	797	666	614	633	264	1315	796	103	976	437
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	24.3	14.9	42.5	32.3	32.3	42.9	30.1	21.3	48.3	34.4	37.7
Incr Delay (d2), s/veh	17.8	0.2	0.1	2.9	6.9	6.7	16.9	0.4	0.5	4.6	0.2	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	5.5	2.3	5.0	12.0	12.4	5.9	6.6	6.5	0.7	1.7	5.3
LnGrp Delay(d),s/veh	57.9	24.5	15.0	45.4	39.2	39.0	59.8	30.5	21.8	52.8	34.6	40.2
LnGrp LOS	E	C	B	D	D	D	E	C	C	D	C	D
Approach Vol, veh/h		942			1238			1061			368	
Approach Delay, s/veh		32.8			40.9			32.9			38.8	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.8	41.7	16.9	24.4	22.4	36.1	7.0	34.4
Change Period (Y+Rc), s	4.0	6.2	4.6	5.8	4.6	6.2	4.6	5.8
Max Green Setting (Gmax), s	20.0	37.0	15.4	27.0	22.4	34.0	6.0	36.4
Max Q Clear Time (g_c+I1), s	12.4	12.9	12.3	13.5	17.7	24.2	3.3	16.4
Green Ext Time (p_c), s	0.4	9.5	0.1	5.2	0.2	5.7	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	36.2
HCM 2010 LOS	D

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	514	1326	1376	812	656	1319	
Future Volume (vph)	514	1326	1376	812	656	1319	
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA	
Protected Phases	3	1	2	3	1	6	8
Permitted Phases		8		2			
Detector Phase	3	1	2	3	1	6	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0	36.3
Total Split (s)	39.0	34.0	47.0	39.0	34.0	81.0	39.0
Total Split (%)	32.5%	28.3%	39.2%	32.5%	28.3%	67.5%	33%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0	
Lead/Lag		Lead	Lag		Lead		
Lead-Lag Optimize?		Yes	Yes		Yes		
Recall Mode	None	None	Min	None	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 104.6
Natural Cycle: 105
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	514	0	1326	0	1376	812	656	1319	0
Future Volume (veh/h)	0	0	0	514	0	1326	0	1376	812	656	1319	0
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	0	1900	0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h				535	0	1316	0	1433	846	683	1374	0
Adj No. of Lanes				2	0	2	0	3	1	2	3	0
Peak Hour Factor				0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1018	0	1441	0	1861	1035	762	3210	0
Arrive On Green				0.29	0.00	0.29	0.00	0.36	0.36	0.22	0.62	0.00
Sat Flow, veh/h				3510	0	2842	0	5358	1581	3510	5358	0
Grp Volume(v), veh/h				535	0	1316	0	1433	846	683	1374	0
Grp Sat Flow(s),veh/h/ln				1755	0	1421	0	1729	1581	1755	1729	0
Q Serve(g_s), s				14.8	0.0	33.7	0.0	28.5	41.7	22.0	16.0	0.0
Cycle Q Clear(g_c), s				14.8	0.0	33.7	0.0	28.5	41.7	22.0	16.0	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h				1018	0	1441	0	1861	1035	762	3210	0
V/C Ratio(X)				0.53	0.00	0.91	0.00	0.77	0.82	0.90	0.43	0.00
Avail Cap(c_a), veh/h				1018	0	1441	0	1861	1035	876	3391	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				34.6	0.0	26.3	0.0	33.0	15.4	44.2	11.5	0.0
Incr Delay (d2), s/veh				0.2	0.0	9.0	0.0	2.1	5.3	10.8	0.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				7.2	0.0	21.0	0.0	13.9	21.7	11.8	7.6	0.0
LnGrp Delay(d),s/veh				34.8	0.0	35.3	0.0	35.1	20.7	55.1	11.5	0.0
LnGrp LOS				C		D		D	C	E	B	
Approach Vol, veh/h					1851			2279			2057	
Approach Delay, s/veh					35.1			29.8			26.0	
Approach LOS					D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	30.2	47.0				77.2		39.0
Change Period (Y+Rc), s	5.0	5.3				* 5.3		5.3
Max Green Setting (Gmax), s	29.0	41.7				* 76		33.7
Max Q Clear Time (g_c+I1), s	24.0	43.7				18.0		35.7
Green Ext Time (p_c), s	1.3	0.0				45.4		0.0

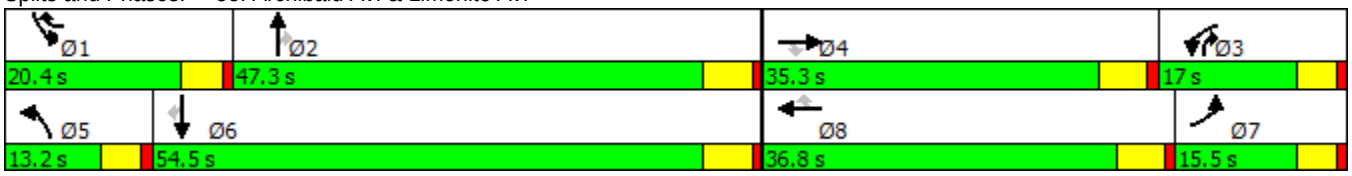
Intersection Summary	
HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	620	92	329	711	824	120	1376	404	448	1319	223
Future Volume (vph)	230	620	92	329	711	824	120	1376	404	448	1319	223
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0	6.0
Minimum Split (s)	9.6	35.3	35.3	9.6	36.3	9.6	9.6	46.3	9.6	9.6	43.3	43.3
Total Split (s)	15.5	35.3	35.3	17.0	36.8	20.4	13.2	47.3	17.0	20.4	54.5	54.5
Total Split (%)	12.9%	29.4%	29.4%	14.2%	30.7%	17.0%	11.0%	39.4%	14.2%	17.0%	45.4%	45.4%
Yellow Time (s)	3.6	4.3	4.3	3.6	4.3	3.6	3.6	4.3	3.6	3.6	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.3	5.3	4.6	5.3	4.6	4.6	5.3	4.6	4.6	5.3	5.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 110.3
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	620	92	329	711	824	120	1376	404	448	1319	223
Future Volume (veh/h)	230	620	92	329	711	824	120	1376	404	448	1319	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1976	1976	1976	1976	1976	1976	1900	1976	1900	1976	1976	1900
Adj Flow Rate, veh/h	240	646	96	343	741	793	125	1433	421	467	1374	232
Adj No. of Lanes	2	2	1	2	2	2	2	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	303	759	339	430	888	1265	183	1956	768	527	2430	728
Arrive On Green	0.08	0.20	0.20	0.12	0.24	0.24	0.05	0.36	0.36	0.14	0.45	0.45
Sat Flow, veh/h	3651	3754	1680	3651	3754	3359	3510	5394	1595	3764	5394	1615
Grp Volume(v), veh/h	240	646	96	343	741	793	125	1433	421	467	1374	232
Grp Sat Flow(s),veh/h/ln	1825	1877	1680	1825	1877	1680	1755	1798	1595	1882	1798	1615
Q Serve(g_s), s	7.2	18.5	4.4	10.2	20.9	14.1	3.9	25.7	7.2	13.6	20.9	7.1
Cycle Q Clear(g_c), s	7.2	18.5	4.4	10.2	20.9	14.1	3.9	25.7	7.2	13.6	20.9	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	303	759	339	430	888	1265	183	1956	768	527	2430	728
V/C Ratio(X)	0.79	0.85	0.28	0.80	0.83	0.63	0.68	0.73	0.55	0.89	0.57	0.32
Avail Cap(c_a), veh/h	357	1011	452	430	1061	1420	271	2033	791	534	2430	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.1	42.9	25.5	47.9	40.5	13.4	51.9	30.8	7.2	47.1	22.6	9.3
Incr Delay (d2), s/veh	8.2	4.3	0.2	9.4	4.3	0.4	1.7	1.4	0.9	15.7	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	10.1	2.3	5.7	11.3	6.5	1.9	13.0	4.4	8.2	10.4	3.9
LnGrp Delay(d),s/veh	58.3	47.2	25.7	57.3	44.7	13.8	53.6	32.2	8.1	62.8	22.9	9.6
LnGrp LOS	E	D	C	E	D	B	D	C	A	E	C	A
Approach Vol, veh/h		982			1877			1979			2073	
Approach Delay, s/veh		47.8			34.0			28.4			30.4	
Approach LOS		D			C			C			C	

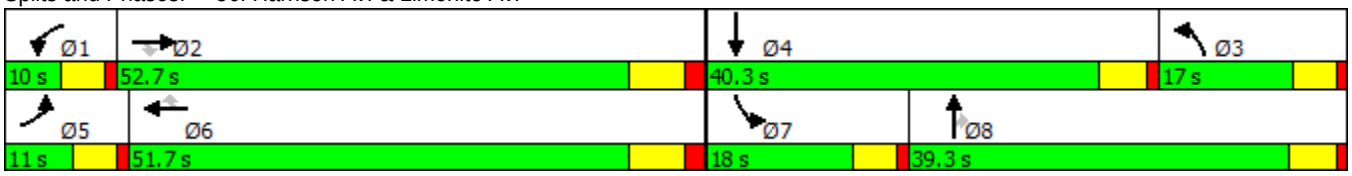
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	45.7	17.7	27.8	10.4	55.5	13.9	31.7
Change Period (Y+Rc), s	4.6	5.3	4.6	5.3	4.6	5.3	4.6	5.3
Max Green Setting (Gmax), s	15.8	42.0	12.4	30.0	8.6	49.2	10.9	31.5
Max Q Clear Time (g_c+I1), s	15.6	27.7	12.2	20.5	5.9	22.9	9.2	22.9
Green Ext Time (p_c), s	0.0	12.7	0.0	2.0	0.0	24.1	0.1	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	33.3
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	71	1640	57	38	1585	82	119	57	144	164	30
Future Volume (vph)	71	1640	57	38	1585	82	119	57	144	164	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	11.0	52.7	52.7	10.0	51.7	51.7	17.0	39.3	39.3	18.0	40.3
Total Split (%)	9.2%	43.9%	43.9%	8.3%	43.1%	43.1%	14.2%	32.8%	32.8%	15.0%	33.6%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 95
Natural Cycle: 110
Control Type: Actuated-Uncoordinated

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	1640	57	38	1585	82	119	57	144	164	30	136
Future Volume (veh/h)	71	1640	57	38	1585	82	119	57	144	164	30	136
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	77	1783	60	41	1723	89	129	62	123	178	33	127
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	99	2566	799	64	2464	751	168	209	177	212	44	171
Arrive On Green	0.05	0.49	0.49	0.04	0.48	0.48	0.09	0.11	0.11	0.12	0.13	0.13
Sat Flow, veh/h	1810	5187	1615	1810	5187	1581	1810	1900	1611	1810	339	1304
Grp Volume(v), veh/h	77	1783	60	41	1723	89	129	62	123	178	0	160
Grp Sat Flow(s),veh/h/ln	1810	1729	1615	1810	1729	1581	1810	1900	1611	1810	0	1642
Q Serve(g_s), s	3.9	24.3	1.0	2.1	23.9	2.9	6.4	2.8	6.8	8.8	0.0	8.6
Cycle Q Clear(g_c), s	3.9	24.3	1.0	2.1	23.9	2.9	6.4	2.8	6.8	8.8	0.0	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	99	2566	799	64	2464	751	168	209	177	212	0	215
V/C Ratio(X)	0.78	0.69	0.08	0.64	0.70	0.12	0.77	0.30	0.70	0.84	0.00	0.74
Avail Cap(c_a), veh/h	118	2584	805	99	2527	771	237	704	597	256	0	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.8	17.8	3.7	43.7	18.9	13.4	40.7	37.6	39.4	39.6	0.0	38.4
Incr Delay (d2), s/veh	18.9	0.8	0.0	3.9	0.8	0.1	5.5	0.8	4.9	15.9	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	11.8	0.8	1.1	11.5	1.3	3.4	1.5	3.2	5.3	0.0	4.2
LnGrp Delay(d),s/veh	61.7	18.7	3.7	47.6	19.8	13.5	46.2	38.4	44.2	55.5	0.0	43.4
LnGrp LOS	E	B	A	D	B	B	D	D	D	E		D
Approach Vol, veh/h		1920			1853			314			338	
Approach Delay, s/veh		19.9			20.1			43.9			49.8	
Approach LOS		B			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	52.4	13.8	17.3	10.0	50.6	15.8	15.4
Change Period (Y+Rc), s	5.0	7.0	5.3	* 5.3	5.0	7.0	5.0	5.3
Max Green Setting (Gmax), s	5.0	45.7	12.0	* 35	6.0	44.7	13.0	34.0
Max Q Clear Time (g_c+I1), s	4.1	26.3	8.4	10.6	5.9	25.9	10.8	8.8
Green Ext Time (p_c), s	0.0	18.2	0.3	0.8	0.0	17.6	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.0
HCM 2010 LOS	C

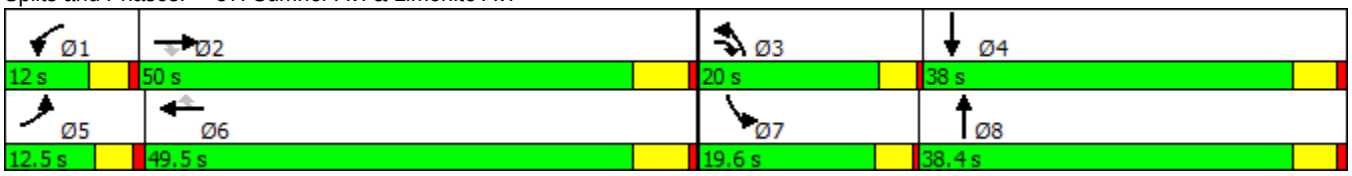
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	100	1642	295	165	1322	22	388	212	126	140
Future Volume (vph)	100	1642	295	165	1322	22	388	212	126	140
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	3	1	6		3	8	7	4
Permitted Phases			2			6				
Detector Phase	5	2	3	1	6	6	3	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	12.5	50.0	20.0	12.0	49.5	49.5	20.0	38.4	19.6	38.0
Total Split (%)	10.4%	41.7%	16.7%	10.0%	41.3%	41.3%	16.7%	32.0%	16.3%	31.7%
Yellow Time (s)	3.5	5.0	3.5	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.9
Natural Cycle: 110
Control Type: Actuated-Uncoordinated

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	1642	295	165	1322	22	388	212	276	126	140	96
Future Volume (veh/h)	100	1642	295	165	1322	22	388	212	276	126	140	96
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	108	1766	309	177	1422	18	417	228	223	135	151	76
Adj No. of Lanes	2	3	1	2	3	1	2	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	170	2314	945	246	2425	755	488	337	297	167	329	157
Arrive On Green	0.05	0.45	0.45	0.07	0.47	0.47	0.14	0.19	0.19	0.09	0.14	0.14
Sat Flow, veh/h	3510	5187	1615	3510	5187	1615	3510	1805	1589	1810	2360	1126
Grp Volume(v), veh/h	108	1766	309	177	1422	18	417	228	223	135	114	113
Grp Sat Flow(s),veh/h/ln	1755	1729	1615	1755	1729	1615	1755	1805	1589	1810	1805	1681
Q Serve(g_s), s	2.9	27.2	9.3	4.7	19.1	0.6	11.0	11.2	12.6	7.0	5.5	5.9
Cycle Q Clear(g_c), s	2.9	27.2	9.3	4.7	19.1	0.6	11.0	11.2	12.6	7.0	5.5	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	170	2314	945	246	2425	755	488	337	297	167	252	235
V/C Ratio(X)	0.63	0.76	0.33	0.72	0.59	0.02	0.85	0.68	0.75	0.81	0.45	0.48
Avail Cap(c_a), veh/h	296	2401	972	277	2425	755	591	634	559	297	627	584
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	22.1	10.1	43.3	18.6	13.6	40.0	36.0	36.6	42.3	37.5	37.7
Incr Delay (d2), s/veh	1.4	1.4	0.2	6.1	0.4	0.0	8.7	1.8	2.9	3.5	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	13.2	4.2	2.5	9.2	0.3	5.9	5.7	5.7	3.7	2.8	2.8
LnGrp Delay(d),s/veh	45.8	23.5	10.3	49.3	18.9	13.6	48.7	37.8	39.4	45.9	38.5	38.9
LnGrp LOS	D	C	B	D	B	B	D	D	D	D	D	D
Approach Vol, veh/h		2183			1617			868			362	
Approach Delay, s/veh		22.8			22.2			43.4			41.4	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	48.4	17.2	18.3	9.1	50.4	12.8	22.7
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	7.5	44.0	16.0	33.0	8.0	43.5	15.6	33.4
Max Q Clear Time (g_c+I1), s	6.7	29.2	13.0	7.9	4.9	21.1	9.0	14.6
Green Ext Time (p_c), s	0.0	13.2	0.2	3.1	0.0	20.4	0.0	2.9

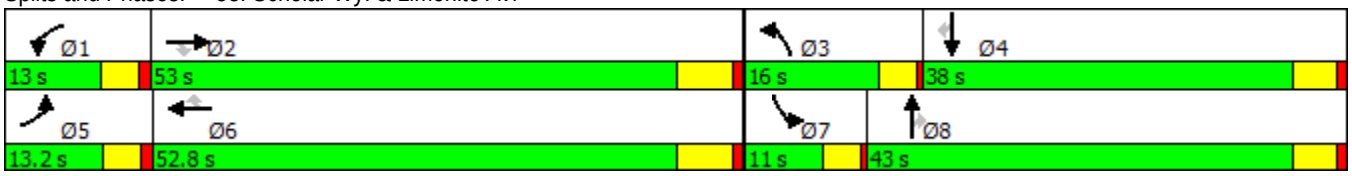
Intersection Summary	
HCM 2010 Ctrl Delay	27.5
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1735	88	90	1335	21	125	147	218	39	194	58
Future Volume (vph)	45	1735	88	90	1335	21	125	147	218	39	194	58
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	13.2	53.0	53.0	13.0	52.8	52.8	16.0	43.0	43.0	11.0	38.0	38.0
Total Split (%)	11.0%	44.2%	44.2%	10.8%	44.0%	44.0%	13.3%	35.8%	35.8%	9.2%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.1
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1735	88	90	1335	21	125	147	218	39	194	58
Future Volume (veh/h)	45	1735	88	90	1335	21	125	147	218	39	194	58
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	1886	87	98	1451	23	136	160	197	42	211	61
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	2588	806	125	2766	861	168	352	299	53	439	185
Arrive On Green	0.03	0.50	0.50	0.07	0.53	0.53	0.09	0.19	0.19	0.03	0.12	0.12
Sat Flow, veh/h	1810	5187	1615	1810	5187	1615	1810	1900	1612	1810	3610	1524
Grp Volume(v), veh/h	49	1886	87	98	1451	23	136	160	197	42	211	61
Grp Sat Flow(s),veh/h/ln	1810	1729	1615	1810	1729	1615	1810	1900	1612	1810	1805	1524
Q Serve(g_s), s	2.4	25.7	2.6	4.8	16.3	0.6	6.6	6.7	10.2	2.1	4.9	3.3
Cycle Q Clear(g_c), s	2.4	25.7	2.6	4.8	16.3	0.6	6.6	6.7	10.2	2.1	4.9	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	63	2588	806	125	2766	861	168	352	299	53	439	185
V/C Ratio(X)	0.78	0.73	0.11	0.78	0.52	0.03	0.81	0.45	0.66	0.79	0.48	0.33
Avail Cap(c_a), veh/h	175	2717	846	171	2766	861	242	805	683	141	1328	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	17.7	11.9	41.1	13.6	9.9	39.9	32.5	33.9	43.3	36.8	36.1
Incr Delay (d2), s/veh	7.6	1.0	0.1	10.0	0.2	0.0	8.0	0.7	1.9	9.2	0.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	12.5	1.1	2.7	7.7	0.3	3.7	3.6	4.7	1.2	2.5	1.4
LnGrp Delay(d),s/veh	50.5	18.7	12.0	51.1	13.8	9.9	47.9	33.2	35.8	52.4	37.4	36.8
LnGrp LOS	D	B	B	D	B	A	D	C	D	D	D	D
Approach Vol, veh/h		2022			1572			493			314	
Approach Delay, s/veh		19.2			16.0			38.3			39.3	
Approach LOS		B			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	50.8	12.4	15.9	7.6	53.8	6.6	21.6
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	8.5	47.0	12.0	33.0	8.7	46.8	7.0	38.0
Max Q Clear Time (g_c+I1), s	6.8	27.7	8.6	6.9	4.4	18.3	4.1	12.2
Green Ext Time (p_c), s	0.0	17.1	0.0	2.3	0.0	25.5	0.0	2.3

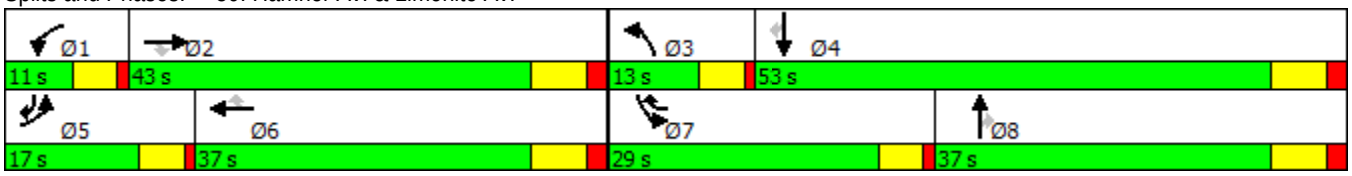
Intersection Summary	
HCM 2010 Ctrl Delay	21.6
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	317	1381	101	162	912	506	126	657	317	660	437	262
Future Volume (vph)	317	1381	101	162	912	506	126	657	317	660	437	262
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	7	3	8	8	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	5.0	5.0	6.0	6.0	5.0	6.0	5.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	10.0	10.0	37.0	37.0	10.0	37.0	10.0
Total Split (s)	17.0	43.0	43.0	11.0	37.0	29.0	13.0	37.0	37.0	29.0	53.0	17.0
Total Split (%)	14.2%	35.8%	35.8%	9.2%	30.8%	24.2%	10.8%	30.8%	30.8%	24.2%	44.2%	14.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0	5.0	7.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 116.8
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	1381	101	162	912	506	126	657	317	660	437	262
Future Volume (veh/h)	317	1381	101	162	912	506	126	657	317	660	437	262
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	327	1424	98	167	940	484	130	677	209	680	451	217
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	360	1596	496	180	1330	744	186	1197	365	720	1986	783
Arrive On Green	0.10	0.31	0.31	0.05	0.26	0.26	0.05	0.23	0.23	0.21	0.38	0.38
Sat Flow, veh/h	3510	5187	1612	3510	5187	1609	3510	5187	1584	3510	5187	1611
Grp Volume(v), veh/h	327	1424	98	167	940	484	130	677	209	680	451	217
Grp Sat Flow(s),veh/h/ln	1755	1729	1612	1755	1729	1609	1755	1729	1584	1755	1729	1611
Q Serve(g_s), s	10.8	30.6	5.2	5.5	19.3	27.1	4.3	13.5	13.7	22.3	6.9	9.4
Cycle Q Clear(g_c), s	10.8	30.6	5.2	5.5	19.3	27.1	4.3	13.5	13.7	22.3	6.9	9.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	360	1596	496	180	1330	744	186	1197	365	720	1986	783
V/C Ratio(X)	0.91	0.89	0.20	0.93	0.71	0.65	0.70	0.57	0.57	0.94	0.23	0.28
Avail Cap(c_a), veh/h	360	1596	496	180	1330	744	240	1330	406	720	2040	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	38.6	29.8	55.3	39.5	24.3	54.5	39.8	39.9	45.8	24.4	17.9
Incr Delay (d2), s/veh	25.4	7.2	0.4	46.0	2.2	2.8	3.4	0.9	3.1	20.8	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	15.7	2.4	3.8	9.5	12.5	2.2	6.6	6.3	12.9	3.3	4.3
LnGrp Delay(d),s/veh	77.4	45.8	30.3	101.3	41.7	27.0	57.9	40.7	43.0	66.6	24.5	18.3
LnGrp LOS	E	D	C	F	D	C	E	D	D	E	C	B
Approach Vol, veh/h		1849			1591			1016			1348	
Approach Delay, s/veh		50.6			43.5			43.4			44.7	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	43.0	11.2	51.8	17.0	37.0	29.0	34.0
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	6.0	36.0	8.0	46.0	12.0	30.0	24.0	30.0
Max Q Clear Time (g_c+I1), s	7.5	32.6	6.3	11.4	12.8	29.1	24.3	15.7
Green Ext Time (p_c), s	0.0	3.3	0.0	20.7	0.0	0.9	0.0	10.9

Intersection Summary	
HCM 2010 Ctrl Delay	46.0
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBT	WBR	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1960	794	1523	1057	424	0	237
Future Volume (vph)	1960	794	1523	1057	424	0	237
Turn Type	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	2		6		4	4	
Permitted Phases		2		6			4
Detector Phase	2	2	6	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	36.5	36.5	23.5	23.5	23.5
Total Split (s)	39.0	39.0	39.0	39.0	26.0	26.0	26.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 65
Offset: 2 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1960	794	0	1523	1057	0	0	0	424	0	237
Future Volume (veh/h)	0	1960	794	0	1523	1057	0	0	0	424	0	237
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900				1900	1900	1900
Adj Flow Rate, veh/h	0	2154	872	0	1674	1162				466	0	161
Adj No. of Lanes	0	3	1	0	3	1				2	0	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91				0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	3433	1047	0	3433	1045				611	0	545
Arrive On Green	0.00	0.66	0.66	0.00	1.00	1.00				0.17	0.00	0.17
Sat Flow, veh/h	0	5358	1582	0	5358	1578				3619	0	3230
Grp Volume(v), veh/h	0	2154	872	0	1674	1162				466	0	161
Grp Sat Flow(s),veh/h/ln	0	1729	1582	0	1729	1578				1810	0	1615
Q Serve(g_s), s	0.0	15.6	27.0	0.0	0.0	0.0				8.0	0.0	2.8
Cycle Q Clear(g_c), s	0.0	15.6	27.0	0.0	0.0	0.0				8.0	0.0	2.8
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3433	1047	0	3433	1045				611	0	545
V/C Ratio(X)	0.00	0.63	0.83	0.00	0.49	1.11				0.76	0.00	0.30
Avail Cap(c_a), veh/h	0	3433	1047	0	3433	1045				1141	0	1019
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.37	0.37	0.00	0.55	0.55				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	6.4	8.3	0.0	0.0	0.0				25.8	0.0	23.6
Incr Delay (d2), s/veh	0.0	0.3	3.1	0.0	0.3	58.7				0.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	12.3	0.0	0.1	17.0				4.0	0.0	1.3
LnGrp Delay(d),s/veh	0.0	6.7	11.3	0.0	0.3	58.7				26.5	0.0	23.7
LnGrp LOS		A	B		A	F				C		C
Approach Vol, veh/h		3026			2836						627	
Approach Delay, s/veh		8.0			24.2						25.8	
Approach LOS		A			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		48.5		16.5		48.5		
Change Period (Y+Rc), s		5.5		5.5		5.5		
Max Green Setting (Gmax), s		33.5		20.5		33.5		
Max Q Clear Time (g_c+I1), s		29.0		10.0		2.0		
Green Ext Time (p_c), s		4.5		1.0		29.6		

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

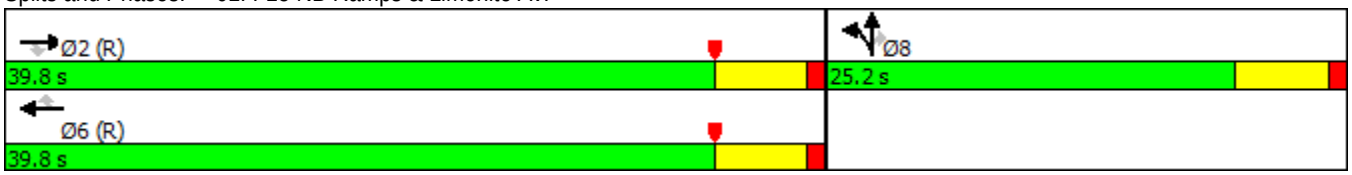
Notes

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	1997	387	1944	413	636	0	654
Future Volume (vph)	1997	387	1944	413	636	0	654
Turn Type	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	2		6		8	8	
Permitted Phases		2		6			8
Detector Phase	2	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	39.8	39.8	39.8	39.8	25.2	25.2	25.2
Total Split (%)	61.2%	61.2%	61.2%	61.2%	38.8%	38.8%	38.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1997	387	0	1944	413	636	0	654	0	0	0
Future Volume (veh/h)	0	1997	387	0	1944	413	636	0	654	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	0	2219	430	0	2160	399	707	0	486			
Adj No. of Lanes	0	3	1	0	3	1	2	0	2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	0	3005	916	0	3005	915	910	0	812			
Arrive On Green	0.00	1.00	1.00	0.00	0.58	0.58	0.25	0.00	0.25			
Sat Flow, veh/h	0	5358	1582	0	5358	1580	3619	0	3230			
Grp Volume(v), veh/h	0	2219	430	0	2160	399	707	0	486			
Grp Sat Flow(s),veh/h/ln	0	1729	1582	0	1729	1580	1810	0	1615			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	19.5	9.2	11.8	0.0	8.6			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	19.5	9.2	11.8	0.0	8.6			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	3005	916	0	3005	915	910	0	812			
V/C Ratio(X)	0.00	0.74	0.47	0.00	0.72	0.44	0.78	0.00	0.60			
Avail Cap(c_a), veh/h	0	3005	916	0	3005	915	1097	0	979			
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.70	0.70	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	9.9	7.7	22.6	0.0	21.4			
Incr Delay (d2), s/veh	0.0	1.2	1.2	0.0	1.5	1.5	3.0	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.3	0.0	9.6	4.4	6.3	0.0	3.9			
LnGrp Delay(d),s/veh	0.0	1.2	1.2	0.0	11.4	9.2	25.6	0.0	22.2			
LnGrp LOS		A	A		B	A	C		C			
Approach Vol, veh/h		2649			2559			1193				
Approach Delay, s/veh		1.2			11.0			24.2				
Approach LOS		A			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		43.2				43.2		21.8
Change Period (Y+Rc), s		5.5				5.5		5.5
Max Green Setting (Gmax), s		34.3				34.3		19.7
Max Q Clear Time (g_c+I1), s		2.0				21.5		13.8
Green Ext Time (p_c), s		29.8				12.3		2.5

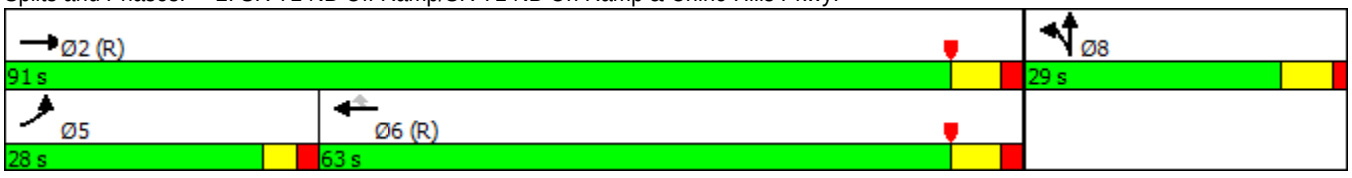
Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Configurations						
Traffic Volume (vph)	561	1500	803	770	548	175
Future Volume (vph)	561	1500	803	770	548	175
Turn Type	Prot	NA	NA	Perm	Split	NA
Protected Phases	5	2	6		8	8
Permitted Phases				6		
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	37.5	27.5	27.5	11.0	11.0
Total Split (s)	28.0	91.0	63.0	63.0	29.0	29.0
Total Split (%)	23.3%	75.8%	52.5%	52.5%	24.2%	24.2%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Act Effct Green (s)	23.0	84.5	56.5	56.5	23.0	23.0
Actuated g/C Ratio	0.19	0.70	0.47	0.47	0.19	0.19
v/c Ratio	1.00	0.63	0.51	1.00	1.01	0.93
Control Delay	84.8	13.6	23.4	56.3	102.5	68.4
Queue Delay	0.0	0.8	1.8	36.4	0.0	0.0
Total Delay	84.8	14.4	25.2	92.7	102.5	68.4
LOS	F	B	C	F	F	E
Approach Delay		33.6	58.3			79.8
Approach LOS		C	E			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 50.9	Intersection LOS: D
Intersection Capacity Utilization 96.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: SR-71 NB Off Ramp/SR-71 NB On Ramp & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	561	1500	0	0	803	770	548	175	114	0	0	0
Future Volume (veh/h)	561	1500	0	0	803	770	548	175	114	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1900	0	0	1900	1900	1800	1900	1900			
Adj Flow Rate, veh/h	603	1613	0	0	863	825	589	188	119			
Adj No. of Lanes	2	2	0	0	2	1	2	1	0			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	602	2542	0	0	1700	750	657	209	132			
Arrive On Green	0.19	0.70	0.00	0.00	0.47	0.47	0.19	0.19	0.19			
Sat Flow, veh/h	3141	3705	0	0	3705	1593	3429	1089	689			
Grp Volume(v), veh/h	603	1613	0	0	863	825	589	0	307			
Grp Sat Flow(s),veh/h/ln	1570	1805	0	0	1805	1593	1714	0	1778			
Q Serve(g_s), s	23.0	28.7	0.0	0.0	19.9	56.5	20.1	0.0	20.2			
Cycle Q Clear(g_c), s	23.0	28.7	0.0	0.0	19.9	56.5	20.1	0.0	20.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.39			
Lane Grp Cap(c), veh/h	602	2542	0	0	1700	750	657	0	341			
V/C Ratio(X)	1.00	0.63	0.00	0.00	0.51	1.10	0.90	0.00	0.90			
Avail Cap(c_a), veh/h	602	2542	0	0	1700	750	657	0	341			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	0.34	0.34	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.5	9.5	0.0	0.0	22.1	31.8	47.3	0.0	47.4			
Incr Delay (d2), s/veh	30.3	0.8	0.0	0.0	0.4	52.8	17.3	0.0	29.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.5	14.4	0.0	0.0	10.0	35.8	11.1	0.0	12.7			
LnGrp Delay(d),s/veh	78.8	10.3	0.0	0.0	22.5	84.5	64.6	0.0	76.4			
LnGrp LOS	F	B			C	F	E		E			
Approach Vol, veh/h		2216			1688			896				
Approach Delay, s/veh		29.0			52.8			68.7				
Approach LOS		C			D			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		91.0			28.0	63.0		29.0
Change Period (Y+Rc), s		6.5			5.0	6.5		6.0
Max Green Setting (Gmax), s		84.5			23.0	56.5		23.0
Max Q Clear Time (g_c+I1), s		30.7			25.0	58.5		22.2
Green Ext Time (p_c), s		41.4			0.0	0.0		0.4

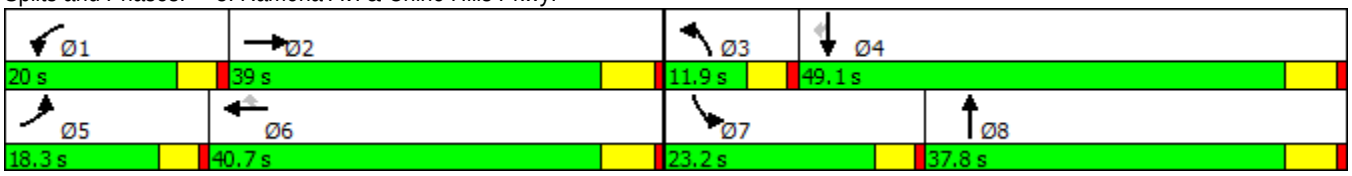
Intersection Summary	
HCM 2010 Ctrl Delay	44.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	329	1282	163	1010	164	29	468	207	435	534
Future Volume (vph)	329	1282	163	1010	164	29	468	207	435	534
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	1	6		3	8	7	4	
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.8	9.6	35.8	35.8	9.6	37.8	9.6	37.8	37.8
Total Split (s)	18.3	39.0	20.0	40.7	40.7	11.9	37.8	23.2	49.1	49.1
Total Split (%)	15.3%	32.5%	16.7%	33.9%	33.9%	9.9%	31.5%	19.3%	40.9%	40.9%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max
Act Effct Green (s)	13.7	34.3	14.3	34.9	34.9	6.3	32.0	17.4	47.1	47.1
Actuated g/C Ratio	0.12	0.29	0.12	0.29	0.29	0.05	0.27	0.15	0.40	0.40
v/c Ratio	0.92	0.91	0.84	1.01	0.29	0.34	0.75	0.88	0.32	0.67
Control Delay	81.7	51.4	84.1	72.9	6.1	64.7	42.3	83.0	26.6	15.6
Queue Delay	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.7	60.6	84.1	72.9	6.1	64.7	42.3	83.0	26.6	15.6
LOS	F	E	F	E	A	E	D	F	C	B
Approach Delay		64.9		66.1			43.2		31.5	
Approach LOS		E		E			D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.8	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 53.9	Intersection LOS: D
Intersection Capacity Utilization 93.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Ramona Av. & Chino Hills Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	1282	3	163	1010	164	29	468	216	207	435	534
Future Volume (veh/h)	329	1282	3	163	1010	164	29	468	216	207	435	534
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	350	1364	3	173	1074	129	31	498	175	220	463	458
Adj No. of Lanes	2	3	0	1	2	1	1	2	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	385	1574	3	199	1064	470	46	707	247	246	1396	615
Arrive On Green	0.12	0.29	0.29	0.12	0.29	0.29	0.03	0.27	0.27	0.14	0.39	0.39
Sat Flow, veh/h	3326	5344	12	1714	3610	1593	1714	2614	913	1714	3610	1591
Grp Volume(v), veh/h	350	883	484	173	1074	129	31	343	330	220	463	458
Grp Sat Flow(s),veh/h/ln	1663	1729	1898	1714	1805	1593	1714	1805	1722	1714	1805	1591
Q Serve(g_s), s	12.3	28.6	28.6	11.7	34.9	7.4	2.1	20.3	20.5	14.9	10.7	29.3
Cycle Q Clear(g_c), s	12.3	28.6	28.6	11.7	34.9	7.4	2.1	20.3	20.5	14.9	10.7	29.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	385	1019	559	199	1064	470	46	488	465	246	1396	615
V/C Ratio(X)	0.91	0.87	0.87	0.87	1.01	0.27	0.67	0.70	0.71	0.90	0.33	0.74
Avail Cap(c_a), veh/h	385	1019	559	223	1064	470	106	488	465	269	1396	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.7	39.6	39.6	51.4	41.7	32.0	57.1	38.9	39.0	49.8	25.5	31.3
Incr Delay (d2), s/veh	24.4	8.2	13.9	24.9	29.8	0.4	6.1	8.2	8.8	26.5	0.6	8.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	14.8	17.1	7.0	21.7	3.3	1.1	11.2	10.9	8.9	5.5	14.2
LnGrp Delay(d),s/veh	76.2	47.8	53.4	76.3	71.6	32.5	63.1	47.1	47.8	76.3	26.2	39.2
LnGrp LOS	E	D	D	E	F	C	E	D	D	E	C	D
Approach Vol, veh/h		1717			1376			704			1141	
Approach Delay, s/veh		55.2			68.5			48.2			41.1	
Approach LOS		E			E			D			D	

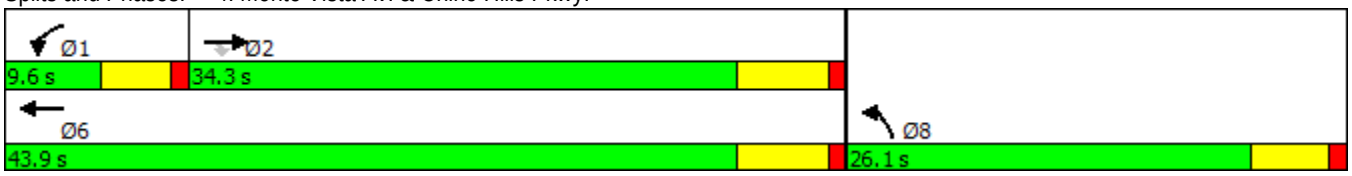
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.3	40.7	7.8	51.6	18.3	40.7	21.6	37.8
Change Period (Y+Rc), s	4.6	5.8	4.6	5.8	4.6	5.8	4.6	5.8
Max Green Setting (Gmax), s	15.4	33.2	7.3	43.3	13.7	34.9	18.6	32.0
Max Q Clear Time (g_c+I1), s	13.7	30.6	4.1	31.3	14.3	36.9	16.9	22.5
Green Ext Time (p_c), s	0.0	2.5	0.0	6.5	0.0	0.0	0.1	5.6

Intersection Summary	
HCM 2010 Ctrl Delay	54.6
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	1209	160	59	1153	166
Future Volume (vph)	1209	160	59	1153	166
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	2		1	6	8
Permitted Phases		2			
Detector Phase	2	2	1	6	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	24.8	24.8	9.6	15.8	26.1
Total Split (s)	34.3	34.3	9.6	43.9	26.1
Total Split (%)	49.0%	49.0%	13.7%	62.7%	37.3%
Yellow Time (s)	4.8	4.8	3.6	4.8	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	5.8	5.1
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	28.0	28.0	5.1	33.1	13.9
Actuated g/C Ratio	0.48	0.48	0.09	0.57	0.24
v/c Ratio	0.77	0.21	0.44	0.62	0.56
Control Delay	18.9	3.1	40.0	10.4	24.6
Queue Delay	0.0	0.0	0.0	0.2	0.0
Total Delay	18.9	3.1	40.0	10.6	24.6
LOS	B	A	D	B	C
Approach Delay	17.0			12.0	24.6
Approach LOS	B			B	C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 58.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 63.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Monte Vista Av. & Chino Hills Pkwy.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1209	160	59	1153	166	45
Future Volume (veh/h)	1209	160	59	1153	166	45
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1343	178	66	1281	184	50
Adj No. of Lanes	2	1	1	2	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1780	777	97	2277	233	63
Arrive On Green	0.49	0.49	0.06	0.63	0.18	0.18
Sat Flow, veh/h	3705	1575	1714	3705	1309	356
Grp Volume(v), veh/h	1343	178	66	1281	235	0
Grp Sat Flow(s),veh/h/ln	1805	1575	1714	1805	1672	0
Q Serve(g_s), s	17.1	3.7	2.2	11.6	7.7	0.0
Cycle Q Clear(g_c), s	17.1	3.7	2.2	11.6	7.7	0.0
Prop In Lane		1.00	1.00		0.78	0.21
Lane Grp Cap(c), veh/h	1780	777	97	2277	298	0
V/C Ratio(X)	0.75	0.23	0.68	0.56	0.79	0.00
Avail Cap(c_a), veh/h	1803	787	150	2411	615	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.7	8.3	26.4	6.0	22.4	0.0
Incr Delay (d2), s/veh	2.0	0.2	3.0	0.4	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	1.6	1.1	5.8	3.9	0.0
LnGrp Delay(d),s/veh	13.6	8.5	29.4	6.4	27.0	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	1521			1347	235	
Approach Delay, s/veh	13.0			7.5	27.0	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.8	33.9				41.8		15.3
Change Period (Y+Rc), s	4.6	5.8				5.8		5.1
Max Green Setting (Gmax), s	5.0	28.5				38.1		21.0
Max Q Clear Time (g_c+I1), s	4.2	19.1				13.6		9.7
Green Ext Time (p_c), s	0.0	9.0				22.4		0.5

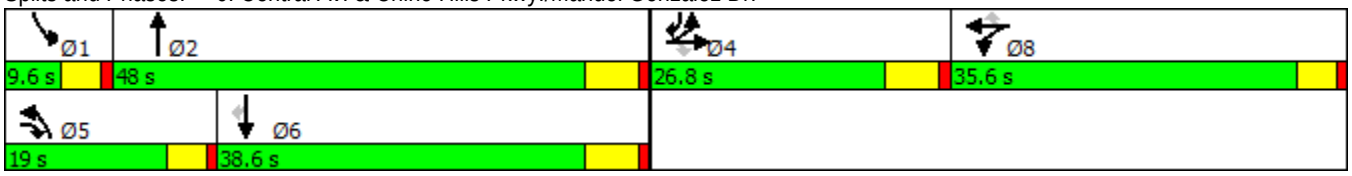
Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	634	2	535	13	48	38	444	1277	12	1084	250
Future Volume (vph)	634	2	535	13	48	38	444	1277	12	1084	250
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA	Prot	NA	pm+ov
Protected Phases	4	4	5	8	8		5	2	1	6	4
Permitted Phases			4			8					6
Detector Phase	4	4	5	8	8	8	5	2	1	6	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	15.8	15.8	9.6	35.6	35.6	35.6	9.6	30.8	9.6	30.8	15.8
Total Split (s)	26.8	26.8	19.0	35.6	35.6	35.6	19.0	48.0	9.6	38.6	26.8
Total Split (%)	22.3%	22.3%	15.8%	29.7%	29.7%	29.7%	15.8%	40.0%	8.0%	32.2%	22.3%
Yellow Time (s)	4.8	4.8	3.6	3.6	3.6	3.6	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	4.6	4.6	4.6	4.6	4.6	5.8	4.6	5.8	5.8
Lead/Lag			Lead				Lead	Lag	Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max	None	Max	None
Act Effct Green (s)	21.3	21.3	38.2	13.6	13.6	13.6	14.6	50.9	5.1	33.2	54.5
Actuated g/C Ratio	0.21	0.21	0.38	0.14	0.14	0.14	0.15	0.51	0.05	0.33	0.54
v/c Ratio	1.00	0.95	0.63	0.06	0.20	0.12	1.00	0.76	0.15	0.99	0.29
Control Delay	90.7	78.4	6.1	37.7	40.5	0.7	86.4	26.0	54.3	57.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.7	78.4	6.1	37.7	40.5	0.7	86.4	26.0	54.3	57.9	5.8
LOS	F	E	A	D	D	A	F	C	D	E	A
Approach Delay		48.7			24.9			41.6		48.2	
Approach LOS		D			C			D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 45.2	Intersection LOS: D
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Central Av. & Chino Hills Pkwy./Manuel Gonzalez Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	634	2	535	13	48	38	444	1277	1	12	1084	250
Future Volume (veh/h)	634	2	535	13	48	38	444	1277	1	12	1084	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	690	0	454	14	52	24	483	1388	1	13	1178	202
Adj No. of Lanes	2	0	1	1	1	1	2	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	729	0	579	169	188	159	485	1713	1	26	1199	873
Arrive On Green	0.21	0.00	0.21	0.10	0.10	0.10	0.15	0.46	0.46	0.02	0.33	0.33
Sat Flow, veh/h	3429	0	1615	1714	1900	1605	3326	3702	3	1714	3610	1593
Grp Volume(v), veh/h	690	0	454	14	52	24	483	677	712	13	1178	202
Grp Sat Flow(s),veh/h/ln	1714	0	1615	1714	1900	1605	1663	1805	1900	1714	1805	1593
Q Serve(g_s), s	19.6	0.0	21.0	0.7	2.5	1.4	14.3	31.8	31.8	0.7	31.9	6.5
Cycle Q Clear(g_c), s	19.6	0.0	21.0	0.7	2.5	1.4	14.3	31.8	31.8	0.7	31.9	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	729	0	579	169	188	159	485	835	879	26	1199	873
V/C Ratio(X)	0.95	0.00	0.78	0.08	0.28	0.15	1.00	0.81	0.81	0.50	0.98	0.23
Avail Cap(c_a), veh/h	729	0	579	538	596	504	485	835	879	87	1199	873
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	0.0	28.3	40.4	41.2	40.7	42.1	22.8	22.8	48.3	32.7	11.7
Incr Delay (d2), s/veh	21.2	0.0	7.0	0.2	0.8	0.4	39.7	8.4	8.0	5.4	22.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	0.0	12.1	0.4	1.4	0.6	9.2	17.7	18.6	0.4	19.6	4.4
LnGrp Delay(d),s/veh	59.6	0.0	35.2	40.6	42.0	41.1	81.9	31.2	30.8	53.7	54.8	12.3
LnGrp LOS	E		D	D	D	D	F	C	C	D	D	B
Approach Vol, veh/h		1144			90			1872			1393	
Approach Delay, s/veh		49.9			41.6			44.1			48.6	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	51.5		26.8	19.0	38.6		14.4
Change Period (Y+Rc), s	4.6	5.8		5.8	4.6	5.8		4.6
Max Green Setting (Gmax), s	5.0	42.2		21.0	14.4	32.8		31.0
Max Q Clear Time (g_c+I1), s	2.7	33.8		23.0	16.3	33.9		4.5
Green Ext Time (p_c), s	0.0	8.0		0.0	0.0	0.0		0.3

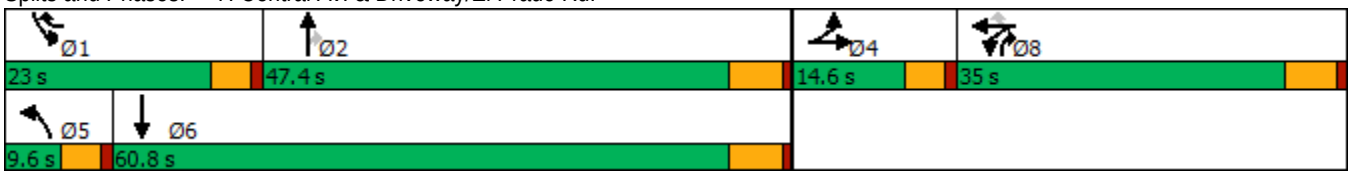
Intersection Summary		
HCM 2010 Ctrl Delay		46.9
HCM 2010 LOS		D

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	30	6	675	5	474	10	1022	618	415	1018
Future Volume (vph)	30	6	675	5	474	10	1022	618	415	1018
Turn Type	Split	NA	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA
Protected Phases	4	4	8	8	1	5	2	8	1	6
Permitted Phases					8			2		
Detector Phase	4	4	8	8	1	5	2	8	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	33.8	33.8	9.6	9.6	28.8	33.8	9.6	28.8
Total Split (s)	14.6	14.6	35.0	35.0	23.0	9.6	47.4	35.0	23.0	60.8
Total Split (%)	12.2%	12.2%	29.2%	29.2%	19.2%	8.0%	39.5%	29.2%	19.2%	50.7%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8
Lead/Lag					Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	10.1	10.1	27.7	27.7	50.9	5.1	42.0	69.8	17.3	62.2
Actuated g/C Ratio	0.09	0.09	0.24	0.24	0.44	0.04	0.37	0.61	0.15	0.54
v/c Ratio	0.21	0.18	0.89	0.86	0.62	0.13	0.80	0.56	0.86	0.39
Control Delay	55.0	25.7	68.8	63.2	21.1	59.5	39.8	4.3	66.4	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	25.7	68.8	63.2	21.1	59.5	39.8	4.3	66.4	17.0
LOS	E	C	E	E	C	E	D	A	E	B
Approach Delay		40.6		47.5			26.6			31.1
Approach LOS		D		D			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 114.6	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 33.9	Intersection LOS: C
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: Central Av. & Driveway/El Prado Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	6	23	675	5	474	10	1022	618	415	1018	20
Future Volume (veh/h)	30	6	23	675	5	474	10	1022	618	415	1018	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	31	6	15	707	0	343	10	1065	468	432	1060	17
Adj No. of Lanes	1	1	0	2	0	1	1	2	1	2	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	122	34	86	798	0	613	20	1322	960	488	2635	42
Arrive On Green	0.07	0.07	0.07	0.23	0.00	0.23	0.01	0.37	0.37	0.15	0.50	0.50
Sat Flow, veh/h	1714	482	1205	3429	0	1615	1714	3610	1593	3326	5257	84
Grp Volume(v), veh/h	31	0	21	707	0	343	10	1065	468	432	697	380
Grp Sat Flow(s),veh/h/ln	1714	0	1687	1714	0	1615	1714	1805	1593	1663	1729	1883
Q Serve(g_s), s	1.9	0.0	1.3	22.6	0.0	19.0	0.7	30.1	18.9	14.5	14.3	14.3
Cycle Q Clear(g_c), s	1.9	0.0	1.3	22.6	0.0	19.0	0.7	30.1	18.9	14.5	14.3	14.3
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	122	0	120	798	0	613	20	1322	960	488	1733	944
V/C Ratio(X)	0.25	0.00	0.18	0.89	0.00	0.56	0.49	0.81	0.49	0.88	0.40	0.40
Avail Cap(c_a), veh/h	151	0	149	882	0	652	75	1322	960	539	1733	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.9	0.0	49.6	42.1	0.0	27.8	55.8	32.3	12.9	47.5	17.7	17.7
Incr Delay (d2), s/veh	0.4	0.0	0.3	10.1	0.0	1.0	6.6	5.3	1.8	14.1	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.6	11.8	0.0	8.6	0.3	15.9	13.6	7.6	6.9	7.7
LnGrp Delay(d),s/veh	50.3	0.0	49.9	52.2	0.0	28.7	62.4	37.7	14.7	61.7	18.4	19.0
LnGrp LOS	D		D	D		C	E	D	B	E	B	B
Approach Vol, veh/h		52			1050			1543			1509	
Approach Delay, s/veh		50.1			44.5			30.9			30.9	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.3	47.4		12.7	6.0	62.7		32.2
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8
Max Green Setting (Gmax), s	18.4	41.6		10.0	5.0	55.0		29.2
Max Q Clear Time (g_c+I1), s	16.5	32.1		3.9	2.7	16.3		24.6
Green Ext Time (p_c), s	0.2	6.9		0.0	0.0	11.7		1.8

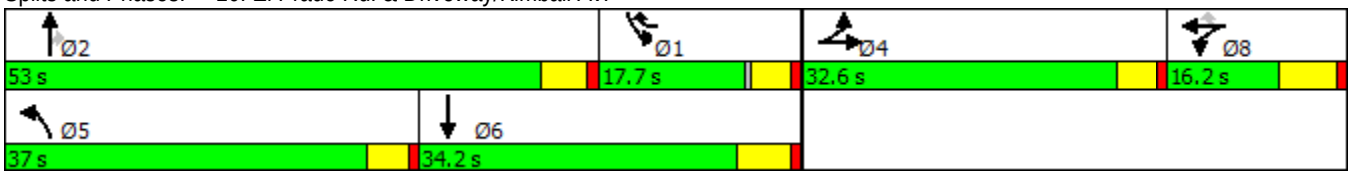
Intersection Summary	
HCM 2010 Ctrl Delay	34.6
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	1	30	545	6	35	56	692	59
Future Volume (vph)	13	1	30	545	6	35	56	692	59
Turn Type	Split	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	4	8	1	5	2		1	6
Permitted Phases				8			2		
Detector Phase	4	4	8	1	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	29.6	29.6	16.2	9.6	9.6	15.2	15.2	9.6	22.8
Total Split (s)	32.6	32.6	16.2	17.7	37.0	53.0	53.0	17.7	34.2
Total Split (%)	27.2%	27.2%	13.5%	14.8%	30.8%	44.2%	44.2%	14.8%	28.5%
Yellow Time (s)	3.6	3.6	5.2	3.6	3.6	4.2	4.2	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	6.2	4.6	4.6	5.2	5.2	4.6	5.8
Lead/Lag				Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	None	Min
Act Effct Green (s)	12.6	12.6	10.4	28.9	5.3	10.4	10.4	13.6	18.1
Actuated g/C Ratio	0.22	0.22	0.18	0.50	0.09	0.18	0.18	0.23	0.31
v/c Ratio	0.04	0.01	0.39	0.53	0.04	0.11	0.15	0.94	0.20
Control Delay	19.8	16.0	29.0	3.0	30.8	25.9	1.0	47.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	16.0	29.0	3.0	30.8	25.9	1.0	47.5	15.7
LOS	B	B	C	A	C	C	A	D	B
Approach Delay		19.2	7.7			11.8			43.2
Approach LOS		B	A			B			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 57.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 26.0	Intersection LOS: C
Intersection Capacity Utilization 62.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: El Prado Rd. & Driveway/Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	2	91	30	545	6	35	56	692	59	49
Future Volume (veh/h)	13	1	2	91	30	545	6	35	56	692	59	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	14	1	0	96	32	123	6	37	58	728	62	51
Adj No. of Lanes	1	1	0	0	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	64	70	0	237	79	651	151	334	284	767	317	261
Arrive On Green	0.04	0.04	0.00	0.17	0.17	0.17	0.09	0.18	0.18	0.23	0.33	0.33
Sat Flow, veh/h	1714	1900	0	1373	458	1615	1714	1900	1615	3326	963	792
Grp Volume(v), veh/h	14	1	0	128	0	123	6	37	58	728	0	113
Grp Sat Flow(s),veh/h/ln	1714	1900	0	1831	0	1615	1714	1900	1615	1663	0	1756
Q Serve(g_s), s	0.5	0.0	0.0	3.5	0.0	0.0	0.2	0.9	1.7	12.3	0.0	2.6
Cycle Q Clear(g_c), s	0.5	0.0	0.0	3.5	0.0	0.0	0.2	0.9	1.7	12.3	0.0	2.6
Prop In Lane	1.00		0.00	0.75		1.00	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	64	70	0	316	0	651	151	334	284	767	0	578
V/C Ratio(X)	0.22	0.01	0.00	0.40	0.00	0.19	0.04	0.11	0.20	0.95	0.00	0.20
Avail Cap(c_a), veh/h	845	936	0	322	0	657	978	1598	1359	767	0	878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	26.4	0.0	20.9	0.0	11.0	23.7	19.7	20.0	21.5	0.0	13.7
Incr Delay (d2), s/veh	1.7	0.1	0.0	0.8	0.0	0.1	0.0	0.1	0.4	20.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.9	0.0	1.3	0.1	0.5	0.8	7.8	0.0	1.3
LnGrp Delay(d),s/veh	28.3	26.4	0.0	21.7	0.0	11.1	23.8	19.8	20.4	42.4	0.0	13.8
LnGrp LOS	C	C		C		B	C	B	C	D		B
Approach Vol, veh/h		15			251			101			841	
Approach Delay, s/veh		28.2			16.5			20.4			38.6	
Approach LOS		C			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.9	15.2		6.7	9.6	24.5		16.0
Change Period (Y+Rc), s	5.8	* 5.2		4.6	4.6	5.8		6.2
Max Green Setting (Gmax), s	13.1	* 48		28.0	32.4	28.4		10.0
Max Q Clear Time (g_c+I1), s	14.3	3.7		2.5	2.2	4.6		5.5
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	1.9		0.4

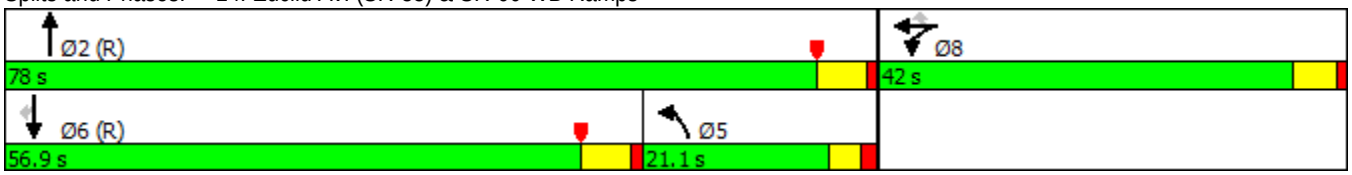
Intersection Summary	
HCM 2010 Ctrl Delay	32.3
HCM 2010 LOS	C

Notes

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	757	8	601	410	1644	1351	807
Future Volume (vph)	757	8	601	410	1644	1351	807
Turn Type	Split	NA	Perm	Prot	NA	NA	Perm
Protected Phases	8	8		5	2	6	
Permitted Phases			8				6
Detector Phase	8	8	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	5.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	9.5	22.5	22.5	22.5
Total Split (s)	42.0	42.0	42.0	21.1	78.0	56.9	56.9
Total Split (%)	35.0%	35.0%	35.0%	17.6%	65.0%	47.4%	47.4%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.5	5.5	5.5	5.5
Lead/Lag				Lag		Lead	Lead
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	37.0	37.0	37.0	16.6	72.5	51.4	51.4
Actuated g/C Ratio	0.31	0.31	0.31	0.14	0.60	0.43	0.43
v/c Ratio	0.99	0.97	0.88	0.94	0.79	0.92	0.81
Control Delay	79.2	74.2	52.9	63.0	9.9	43.2	13.7
Queue Delay	0.0	0.4	0.0	0.0	1.6	45.7	0.0
Total Delay	79.2	74.5	52.9	63.0	11.5	88.9	13.7
LOS	E	E	D	E	B	F	B
Approach Delay		69.3			21.8	60.8	
Approach LOS		E			C	E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 48.5	Intersection LOS: D
Intersection Capacity Utilization 144.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 14: Euclid Av. (SR-83) & SR-60 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	757	8	601	410	1644	0	0	1351	807
Future Volume (veh/h)	0	0	0	757	8	601	410	1644	0	0	1351	807
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1800	1900	1900	1800	1900	0	0	1900	1900
Adj Flow Rate, veh/h				949	0	322	432	1731	0	0	1422	849
Adj No. of Lanes				2	0	1	2	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1010	0	470	478	2231	0	0	1546	679
Arrive On Green				0.29	0.00	0.29	0.29	1.00	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3429	0	1594	3326	3705	0	0	3705	1585
Grp Volume(v), veh/h				949	0	322	432	1731	0	0	1422	849
Grp Sat Flow(s),veh/h/ln				1714	0	1594	1663	1805	0	0	1805	1585
Q Serve(g_s), s				32.4	0.0	21.4	15.0	0.0	0.0	0.0	44.6	51.4
Cycle Q Clear(g_c), s				32.4	0.0	21.4	15.0	0.0	0.0	0.0	44.6	51.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1010	0	470	478	2231	0	0	1546	679
V/C Ratio(X)				0.94	0.00	0.69	0.90	0.78	0.00	0.00	0.92	1.25
Avail Cap(c_a), veh/h				1057	0	492	478	2231	0	0	1546	679
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.43	0.43	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				41.3	0.0	37.4	41.9	0.0	0.0	0.0	32.4	34.3
Incr Delay (d2), s/veh				14.6	0.0	3.0	10.2	1.2	0.0	0.0	10.4	124.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.3	0.0	9.8	7.5	0.4	0.0	0.0	24.3	45.9
LnGrp Delay(d),s/veh				55.9	0.0	40.4	52.1	1.2	0.0	0.0	42.7	158.9
LnGrp LOS				E		D	D	A			D	F
Approach Vol, veh/h					1271			2163			2271	
Approach Delay, s/veh					52.0			11.4			86.1	
Approach LOS					D			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		79.7			22.8	56.9		40.3
Change Period (Y+Rc), s		5.5			5.5	* 5.5		5.0
Max Green Setting (Gmax), s		72.5			16.6	* 51		37.0
Max Q Clear Time (g_c+I1), s		2.0			17.0	53.4		34.4
Green Ext Time (p_c), s		37.9			0.0	0.0		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	50.2
HCM 2010 LOS	D

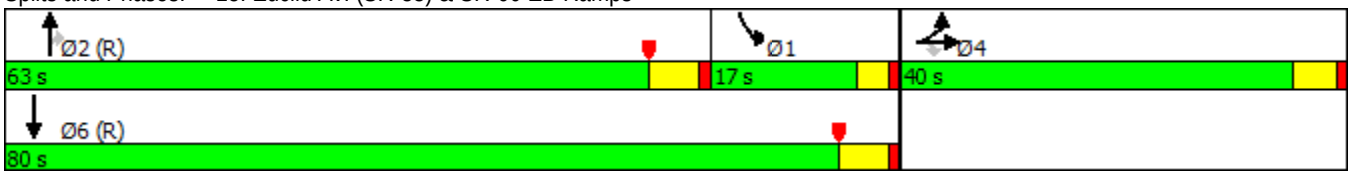
Notes

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	592	2	524	1462	594	277	1831
Future Volume (vph)	592	2	524	1462	594	277	1831
Turn Type	Split	NA	Perm	NA	Perm	Prot	NA
Protected Phases	4	4		2		1	6
Permitted Phases			4		2		
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	11.0	11.0	22.5	22.5	9.0	22.5
Total Split (s)	40.0	40.0	40.0	63.0	63.0	17.0	80.0
Total Split (%)	33.3%	33.3%	33.3%	52.5%	52.5%	14.2%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	4.0	5.5
Lead/Lag				Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	32.5	32.5	32.5	60.5	60.5	12.5	77.0
Actuated g/C Ratio	0.27	0.27	0.27	0.50	0.50	0.10	0.64
v/c Ratio	0.91	0.88	0.76	0.82	0.58	0.82	0.81
Control Delay	67.8	61.7	43.0	47.5	22.6	66.4	21.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	47.5
Total Delay	67.8	61.7	43.0	47.7	22.6	66.4	68.7
LOS	E	E	D	D	C	E	E
Approach Delay		58.0		40.4			68.4
Approach LOS		E		D			E

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 55.3 — Intersection LOS: E
Intersection Capacity Utilization 144.5% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 15: Euclid Av. (SR-83) & SR-60 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	592	2	524	0	0	0	0	1462	594	277	1831	0
Future Volume (veh/h)	592	2	524	0	0	0	0	1462	594	277	1831	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900				0	1900	1900	1800	1900	0
Adj Flow Rate, veh/h	747	0	306				0	1492	606	283	1868	0
Adj No. of Lanes	2	0	1				0	2	1	2	2	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	825	0	389				0	1672	736	541	2425	0
Arrive On Green	0.24	0.00	0.24				0.00	0.62	0.62	0.33	1.00	0.00
Sat Flow, veh/h	3429	0	1615				0	3705	1588	3326	3705	0
Grp Volume(v), veh/h	747	0	306				0	1492	606	283	1868	0
Grp Sat Flow(s),veh/h/ln	1714	0	1615				0	1805	1588	1663	1805	0
Q Serve(g_s), s	25.4	0.0	21.3				0.0	42.3	35.7	8.3	0.0	0.0
Cycle Q Clear(g_c), s	25.4	0.0	21.3				0.0	42.3	35.7	8.3	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	825	0	389				0	1672	736	541	2425	0
V/C Ratio(X)	0.91	0.00	0.79				0.00	0.89	0.82	0.52	0.77	0.00
Avail Cap(c_a), veh/h	1000	0	471				0	1730	761	541	2425	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.33	1.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.40	0.40	0.23	0.23	0.00
Uniform Delay (d), s/veh	44.2	0.0	42.7				0.0	20.5	19.2	36.7	0.0	0.0
Incr Delay (d2), s/veh	9.2	0.0	5.7				0.0	3.4	4.4	0.1	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.1	0.0	10.1				0.0	21.5	16.4	3.8	0.2	0.0
LnGrp Delay(d),s/veh	53.4	0.0	48.4				0.0	23.9	23.6	36.8	0.6	0.0
LnGrp LOS	D		D					C	C	D	A	
Approach Vol, veh/h		1053						2098			2151	
Approach Delay, s/veh		51.9						23.8			5.3	
Approach LOS		D						C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.0	61.1		33.9		86.1		
Change Period (Y+Rc), s	5.5	* 5.5		5.0		5.5		
Max Green Setting (Gmax), s	13.0	* 58		35.0		74.5		
Max Q Clear Time (g_c+I1), s	10.3	44.3		27.4		2.0		
Green Ext Time (p_c), s	2.6	11.3		1.5		42.8		

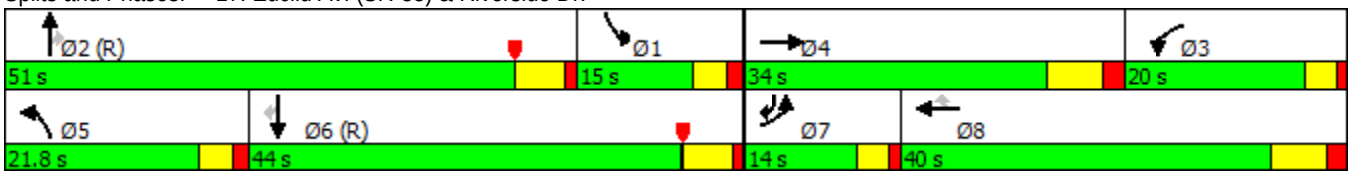
Intersection Summary	
HCM 2010 Ctrl Delay	21.9
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	192	492	236	441	70	302	1713	615	166	1787	227
Future Volume (vph)	192	492	236	441	70	302	1713	615	166	1787	227
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	34.0	9.0	40.0	40.0	9.5	32.5	32.5	9.5	38.5	9.0
Total Split (s)	14.0	34.0	20.0	40.0	40.0	21.8	51.0	51.0	15.0	44.0	14.0
Total Split (%)	11.7%	28.3%	16.7%	33.3%	33.3%	18.2%	42.5%	42.5%	12.5%	36.7%	11.7%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	1.5	1.0	1.0	1.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.5	5.5	5.5	4.5	5.5	4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
Act Effct Green (s)	10.0	26.6	16.4	33.0	33.0	17.3	45.5	45.5	10.5	38.7	50.2
Actuated g/C Ratio	0.08	0.22	0.14	0.28	0.28	0.14	0.38	0.38	0.09	0.32	0.42
v/c Ratio	1.45	0.90	1.09	0.48	0.14	1.32	0.94	0.80	1.19	1.15	0.33
Control Delay	276.6	58.6	133.6	38.2	0.5	191.0	47.3	31.6	160.9	101.3	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	276.6	58.6	133.6	38.2	0.5	191.0	47.3	31.6	160.9	101.3	11.1
LOS	F	E	F	D	A	F	D	C	F	F	B
Approach Delay		106.9		64.9			60.1			96.5	
Approach LOS		F		E			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 63 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 79.3	Intersection LOS: E
Intersection Capacity Utilization 102.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 17: Euclid Av. (SR-83) & Riverside Dr.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	492	181	236	441	70	302	1713	615	166	1787	227
Future Volume (veh/h)	192	492	181	236	441	70	302	1713	615	166	1787	227
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	206	529	161	254	474	75	325	1842	530	178	1922	146
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	143	588	178	229	1048	462	247	1962	611	1429	5580	1871
Arrive On Green	0.08	0.22	0.22	0.13	0.29	0.29	0.05	0.12	0.12	0.27	0.36	0.36
Sat Flow, veh/h	1714	2731	828	1714	3610	1592	1714	5187	1615	1714	5187	1614
Grp Volume(v), veh/h	206	349	341	254	474	75	325	1842	530	178	1922	146
Grp Sat Flow(s),veh/h/ln	1714	1805	1754	1714	1805	1592	1714	1729	1615	1714	1729	1614
Q Serve(g_s), s	10.0	22.6	22.7	16.0	12.9	3.2	17.3	42.2	38.7	9.4	0.0	0.0
Cycle Q Clear(g_c), s	10.0	22.6	22.7	16.0	12.9	3.2	17.3	42.2	38.7	9.4	0.0	0.0
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	143	389	378	229	1048	462	247	1962	611	1429	5580	1871
V/C Ratio(X)	1.44	0.90	0.90	1.11	0.45	0.16	1.32	0.94	0.87	0.12	0.34	0.08
Avail Cap(c_a), veh/h	143	406	395	229	1048	462	247	1967	612	1429	5580	1871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.40	0.40	0.40	0.40	0.40	0.40
Uniform Delay (d), s/veh	55.0	45.8	45.9	52.0	34.8	18.4	57.1	51.1	49.6	10.6	0.0	0.0
Incr Delay (d2), s/veh	233.9	22.0	23.4	92.6	0.4	0.2	153.0	4.8	6.9	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	13.6	13.5	13.4	6.4	1.4	18.7	21.1	18.5	4.5	0.0	0.0
LnGrp Delay(d),s/veh	288.9	67.8	69.3	144.6	35.2	18.6	210.1	55.9	56.4	10.7	0.1	0.0
LnGrp LOS	F	E	E	F	D	B	F	E	E	B	A	A
Approach Vol, veh/h		896			803			2697			2246	
Approach Delay, s/veh		119.2			68.3			74.6			0.9	
Approach LOS		F			E			E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	108.2	50.9	23.0	32.9	21.8	137.3	14.0	41.9
Change Period (Y+Rc), s	5.5	* 5.5	7.0	* 7	4.5	5.5	4.0	7.0
Max Green Setting (Gmax), s	10.5	* 46	16.0	* 27	17.3	38.5	10.0	33.0
Max Q Clear Time (g_c+I1), s	11.4	44.2	18.0	24.7	19.3	2.0	12.0	14.9
Green Ext Time (p_c), s	0.0	1.1	0.0	1.1	0.0	21.0	0.0	4.2

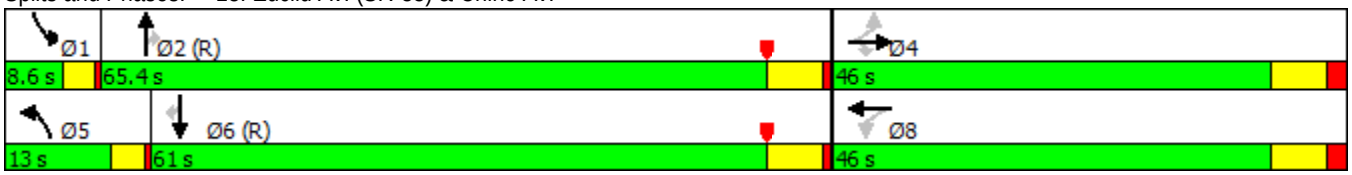
Intersection Summary	
HCM 2010 Ctrl Delay	54.9
HCM 2010 LOS	D

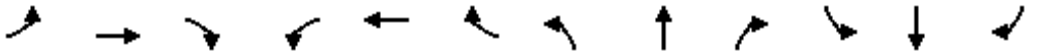
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	89	222	61	165	202	84	2576	436	50	1945	115
Future Volume (vph)	89	222	61	165	202	84	2576	436	50	1945	115
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	4	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	40.0	40.0	40.0	34.0	34.0	8.5	29.0	29.0	8.5	36.0	36.0
Total Split (s)	46.0	46.0	46.0	46.0	46.0	13.0	65.4	65.4	8.6	61.0	61.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	10.8%	54.5%	54.5%	7.2%	50.8%	50.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	26.6	26.6	26.6	26.6	26.6	9.8	71.2	71.2	7.5	67.1	67.1
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.08	0.59	0.59	0.06	0.56	0.56
v/c Ratio	0.67	0.55	0.15	0.92	0.69	0.62	0.86	0.45	0.49	0.69	0.13
Control Delay	64.1	44.8	3.3	93.2	48.2	46.9	36.6	24.6	66.3	6.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	44.8	3.3	93.2	48.2	46.9	36.6	24.6	66.3	6.5	0.2
LOS	E	D	A	F	D	D	D	C	E	A	A
Approach Delay		42.6			64.9		35.2			7.5	
Approach LOS		D			E		D			A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 119 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 28.2	Intersection LOS: C
Intersection Capacity Utilization 95.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 18: Euclid Av. (SR-83) & Chino Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	222	61	165	202	79	84	2576	436	50	1945	115
Future Volume (veh/h)	89	222	61	165	202	79	84	2576	436	50	1945	115
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	92	229	63	170	208	77	87	2656	393	52	2005	90
Adj No. of Lanes	1	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	227	539	458	265	376	139	108	2803	873	66	2674	815
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.06	0.54	0.54	0.08	1.00	1.00
Sat Flow, veh/h	1112	1900	1615	1104	1324	490	1714	5187	1615	1714	5187	1580
Grp Volume(v), veh/h	92	229	63	170	0	285	87	2656	393	52	2005	90
Grp Sat Flow(s),veh/h/ln	1112	1900	1615	1104	0	1814	1714	1729	1615	1714	1729	1580
Q Serve(g_s), s	9.2	11.8	3.5	17.8	0.0	16.0	6.0	57.9	17.7	3.6	0.0	0.0
Cycle Q Clear(g_c), s	25.2	11.8	3.5	29.6	0.0	16.0	6.0	57.9	17.7	3.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	539	458	265	0	515	108	2803	873	66	2674	815
V/C Ratio(X)	0.41	0.42	0.14	0.64	0.00	0.55	0.80	0.95	0.45	0.79	0.75	0.11
Avail Cap(c_a), veh/h	273	618	525	311	0	589	136	2803	873	73	2674	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	47.2	35.0	32.0	47.0	0.0	36.5	55.5	26.0	16.7	54.9	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.5	0.1	3.5	0.0	0.9	2.0	1.0	0.2	4.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	6.2	1.6	5.7	0.0	8.1	2.9	27.8	7.9	1.8	0.0	0.0
LnGrp Delay(d),s/veh	48.4	35.5	32.2	50.5	0.0	37.4	57.5	27.0	16.9	59.2	0.2	0.0
LnGrp LOS	D	D	C	D		D	E	C	B	E	A	A
Approach Vol, veh/h		384			455			3136			2147	
Approach Delay, s/veh		38.1			42.3			26.6			1.6	
Approach LOS		D			D			C			A	

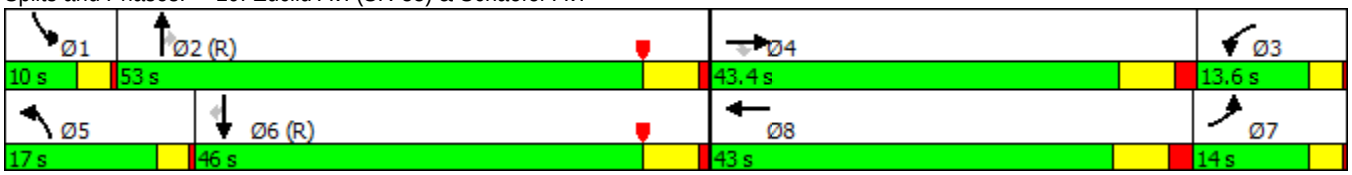
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	70.9		41.1	11.1	67.9		41.1
Change Period (Y+Rc), s	3.5	6.0		7.0	3.5	6.0		7.0
Max Green Setting (Gmax), s	5.1	59.4		39.0	9.5	55.0		39.0
Max Q Clear Time (g_c+I1), s	5.6	59.9		27.2	8.0	2.0		31.6
Green Ext Time (p_c), s	0.0	0.0		3.2	0.0	51.6		2.5

Intersection Summary	
HCM 2010 Ctrl Delay	19.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	459	289	240	35	63	224	2566	77	122	2138	364
Future Volume (vph)	459	289	240	35	63	224	2566	77	122	2138	364
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	13.5	43.0	8.5	33.0	33.0	8.5	28.0	28.0
Total Split (s)	14.0	43.4	43.4	13.6	43.0	17.0	53.0	53.0	10.0	46.0	46.0
Total Split (%)	11.7%	36.2%	36.2%	11.3%	35.8%	14.2%	44.2%	44.2%	8.3%	38.3%	38.3%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	28.0	36.4	36.4	11.9	14.9	17.1	47.0	47.0	10.1	40.0	40.0
Actuated g/C Ratio	0.23	0.30	0.30	0.10	0.12	0.14	0.39	0.39	0.08	0.33	0.33
v/c Ratio	0.63	0.52	0.37	0.21	0.51	0.92	1.30	0.11	0.88	1.27	0.59
Control Delay	47.3	40.5	5.9	52.8	36.7	54.5	161.0	1.8	101.3	164.5	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	40.5	5.9	52.8	36.7	54.5	161.0	1.8	101.3	164.5	27.5
LOS	D	D	A	D	D	D	F	A	F	F	C
Approach Delay		35.2			40.2		148.4			142.5	
Approach LOS		D			D		F			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 126.6	Intersection LOS: F
Intersection Capacity Utilization 97.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 19: Euclid Av. (SR-83) & Schaefer Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	459	289	240	35	63	64	224	2566	77	122	2138	364
Future Volume (veh/h)	459	289	240	35	63	64	224	2566	77	122	2138	364
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1768	1900	1900	1800	1900	1900	1872	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	473	298	171	36	65	61	231	2645	70	126	2204	322
Adj No. of Lanes	2	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	471	345	293	92	82	77	201	2821	878	93	2518	766
Arrive On Green	0.14	0.18	0.18	0.05	0.09	0.09	0.15	0.72	0.72	0.11	0.97	0.97
Sat Flow, veh/h	3267	1900	1615	1714	903	847	1783	5187	1615	1714	5187	1579
Grp Volume(v), veh/h	473	298	171	36	0	126	231	2645	70	126	2204	322
Grp Sat Flow(s),veh/h/ln	1633	1900	1615	1714	0	1750	1783	1729	1615	1714	1729	1579
Q Serve(g_s), s	17.3	18.3	8.8	2.4	0.0	8.5	13.5	52.6	1.1	6.5	9.8	0.7
Cycle Q Clear(g_c), s	17.3	18.3	8.8	2.4	0.0	8.5	13.5	52.6	1.1	6.5	9.8	0.7
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	471	345	293	92	0	160	201	2821	878	93	2518	766
V/C Ratio(X)	1.00	0.86	0.58	0.39	0.00	0.79	1.15	0.94	0.08	1.36	0.88	0.42
Avail Cap(c_a), veh/h	471	576	490	144	0	525	201	2821	878	93	2518	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.66	0.66	0.66
Uniform Delay (d), s/veh	51.4	47.7	25.7	54.9	0.0	53.4	51.0	14.8	3.9	53.5	1.0	0.3
Incr Delay (d2), s/veh	42.6	5.8	1.4	1.0	0.0	6.4	73.9	0.8	0.0	199.6	3.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	10.2	4.0	1.2	0.0	4.4	10.7	24.7	0.5	8.2	2.7	0.4
LnGrp Delay(d),s/veh	93.9	53.5	27.1	55.8	0.0	59.8	125.0	15.7	3.9	253.1	4.2	1.4
LnGrp LOS	F	D	C	E		E	F	B	A	F	A	A
Approach Vol, veh/h		942			162			2946			2652	
Approach Delay, s/veh		69.0			58.9			24.0			15.7	
Approach LOS		E			E			C			B	

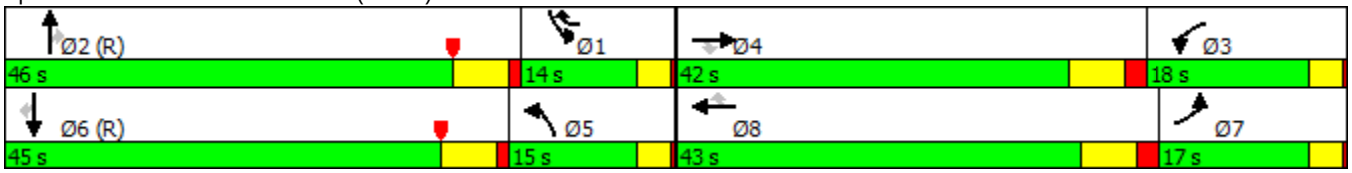
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	71.3	10.0	28.8	17.0	64.3	20.8	17.9
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	6.5	47.0	10.1	36.4	13.5	40.0	10.5	36.0
Max Q Clear Time (g_c+I1), s	8.5	54.6	4.4	20.3	15.5	11.8	19.3	10.5
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	27.8	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	27.9
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	465	1072	346	166	509	507	221	1976	230	536	1565	217
Future Volume (vph)	465	1072	346	166	509	507	221	1976	230	536	1565	217
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	42.0	42.0	8.5	42.0	8.5	8.5	29.0	29.0	8.5	40.0	40.0
Total Split (s)	17.0	42.0	42.0	18.0	43.0	14.0	15.0	46.0	46.0	14.0	45.0	45.0
Total Split (%)	14.2%	35.0%	35.0%	15.0%	35.8%	11.7%	12.5%	38.3%	38.3%	11.7%	37.5%	37.5%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.5	2.0	2.0	0.5	2.0	0.5	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	7.0	7.0	3.5	7.0	3.5	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	25.2	35.0	35.0	13.7	23.6	41.1	12.0	40.8	40.8	10.5	39.3	39.3
Actuated g/C Ratio	0.21	0.29	0.29	0.11	0.20	0.34	0.10	0.34	0.34	0.09	0.33	0.33
v/c Ratio	0.68	0.99	0.57	0.46	0.70	0.87	0.70	1.01	0.34	1.94	0.83	0.33
Control Delay	50.4	66.7	17.0	54.0	49.4	48.6	34.7	36.0	2.9	452.6	18.2	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.4	66.7	17.0	54.0	49.4	48.6	34.7	36.0	2.9	452.6	18.2	4.2
LOS	D	E	B	D	D	D	C	D	A	F	B	A
Approach Delay		53.5			49.7			32.8			117.4	
Approach LOS		D			D			C			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 51 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.94	
Intersection Signal Delay: 65.5	Intersection LOS: E
Intersection Capacity Utilization 107.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: Euclid Av. (SR-83) & Edison Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	465	1072	346	166	509	507	221	1976	230	536	1565	217
Future Volume (veh/h)	465	1072	346	166	509	507	221	1976	230	536	1565	217
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1768	1900	1900	1700	1900	1900	1700	1976	1900	1700	1976	1900
Adj Flow Rate, veh/h	474	1094	200	169	519	262	226	2016	133	547	1597	119
Adj No. of Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	603	1108	464	225	691	518	512	1976	538	450	1863	507
Arrive On Green	0.18	0.29	0.29	0.07	0.18	0.18	0.32	0.67	0.67	0.05	0.10	0.10
Sat Flow, veh/h	3368	3800	1591	3238	3800	1615	3238	5928	1615	3238	5928	1615
Grp Volume(v), veh/h	474	1094	200	169	519	262	226	2016	133	547	1597	119
Grp Sat Flow(s),veh/h/ln	1684	1900	1591	1619	1900	1615	1619	1976	1615	1619	1976	1615
Q Serve(g_s), s	16.1	34.4	12.2	6.1	15.5	0.0	6.7	40.0	3.9	16.7	31.8	8.1
Cycle Q Clear(g_c), s	16.1	34.4	12.2	6.1	15.5	0.0	6.7	40.0	3.9	16.7	31.8	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	603	1108	464	225	691	518	512	1976	538	450	1863	507
V/C Ratio(X)	0.79	0.99	0.43	0.75	0.75	0.51	0.44	1.02	0.25	1.22	0.86	0.23
Avail Cap(c_a), veh/h	603	1108	464	391	1140	709	512	1976	538	450	1927	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Uniform Delay (d), s/veh	47.0	42.3	34.4	54.8	46.5	33.0	36.8	20.0	14.0	57.2	51.1	40.5
Incr Delay (d2), s/veh	6.2	23.8	0.6	1.9	1.7	0.8	0.0	12.2	0.1	98.9	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	21.6	5.5	2.8	8.3	7.1	2.9	23.1	1.7	13.7	17.5	3.7
LnGrp Delay(d),s/veh	53.3	66.1	35.1	56.8	48.2	33.8	36.8	32.2	14.1	156.1	51.7	40.6
LnGrp LOS	D	E	D	E	D	C	D	F	B	F	D	D
Approach Vol, veh/h		1768			950			2375			2263	
Approach Delay, s/veh		59.2			45.7			31.6			76.3	
Approach LOS		E			D			C			E	

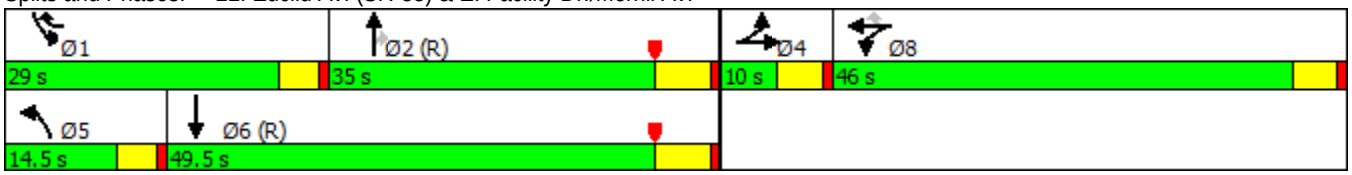
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	46.0	11.8	42.0	22.5	43.7	25.0	28.8
Change Period (Y+Rc), s	3.5	6.0	3.5	7.0	3.5	6.0	3.5	7.0
Max Green Setting (Gmax), s	10.5	40.0	14.5	35.0	11.5	39.0	13.5	36.0
Max Q Clear Time (g_c+I1), s	18.7	42.0	8.1	36.4	8.7	33.8	18.1	17.5
Green Ext Time (p_c), s	0.0	0.0	0.2	0.0	0.6	3.9	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	53.8
HCM 2010 LOS	D

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	27	0	422	2	2280	251	612	1898
Future Volume (vph)	27	0	422	2	2280	251	612	1898
Turn Type	NA	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases	4	8	1	5	2		1	6
Permitted Phases			8			2		
Detector Phase	4	8	1	5	2	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	10.0	46.0	14.5	14.5	28.0	28.0	14.5	28.0
Total Split (s)	10.0	46.0	29.0	14.5	35.0	35.0	29.0	49.5
Total Split (%)	8.3%	38.3%	24.2%	12.1%	29.2%	29.2%	24.2%	41.3%
Yellow Time (s)	4.0	4.0	3.5	3.5	5.0	5.0	3.5	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag			Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	5.0	21.6	56.0	10.0	45.5	45.5	29.4	76.5
Actuated g/C Ratio	0.04	0.18	0.47	0.08	0.38	0.38	0.24	0.64
v/c Ratio	0.57	0.58	0.55	0.01	1.21	0.39	0.83	0.62
Control Delay	70.0	50.9	17.4	67.0	123.8	7.0	45.1	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.0	50.9	17.4	67.0	123.8	7.0	45.1	9.4
LOS	E	D	B	E	F	A	D	A
Approach Delay	70.0	27.2			112.2			18.1
Approach LOS	E	C			F			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 93 (78%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 61.4	Intersection LOS: E
Intersection Capacity Utilization 93.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 22: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	27	14	176	0	422	2	2280	251	612	1898	1
Future Volume (veh/h)	6	27	14	176	0	422	2	2280	251	612	1898	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1976	1900	1768	1900	1900
Adj Flow Rate, veh/h	6	29	7	189	0	239	2	2452	241	658	2041	1
Adj No. of Lanes	0	1	0	0	1	1	1	3	1	2	3	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	8	40	10	251	0	554	9	2454	725	667	3501	2
Arrive On Green	0.03	0.03	0.03	0.14	0.00	0.14	0.01	0.45	0.45	0.20	0.65	0.65
Sat Flow, veh/h	262	1266	305	1810	0	1615	1714	5394	1594	3267	5355	3
Grp Volume(v), veh/h	42	0	0	189	0	239	2	2452	241	658	1318	724
Grp Sat Flow(s),veh/h/ln	1833	0	0	1810	0	1615	1714	1798	1594	1633	1729	1899
Q Serve(g_s), s	2.7	0.0	0.0	12.1	0.0	13.7	0.1	54.5	11.6	24.1	25.6	25.6
Cycle Q Clear(g_c), s	2.7	0.0	0.0	12.1	0.0	13.7	0.1	54.5	11.6	24.1	25.6	25.6
Prop In Lane	0.14		0.17	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	58	0	0	251	0	554	9	2454	725	667	2261	1242
V/C Ratio(X)	0.73	0.00	0.00	0.75	0.00	0.43	0.22	1.00	0.33	0.99	0.58	0.58
Avail Cap(c_a), veh/h	76	0	0	618	0	882	143	2454	725	667	2261	1242
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.6	0.0	0.0	49.7	0.0	30.4	59.4	32.7	21.0	47.6	11.6	11.6
Incr Delay (d2), s/veh	13.1	0.0	0.0	1.7	0.0	0.2	2.1	12.3	0.6	31.3	1.1	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	6.2	0.0	6.1	0.1	29.8	5.2	13.8	12.4	14.0
LnGrp Delay(d),s/veh	70.7	0.0	0.0	51.4	0.0	30.6	61.5	45.0	21.6	78.9	12.7	13.6
LnGrp LOS	E			D		C	E	D	C	E	B	B
Approach Vol, veh/h		42			428			2695			2700	
Approach Delay, s/veh		70.7			39.8			42.9			29.1	
Approach LOS		E			D			D			C	

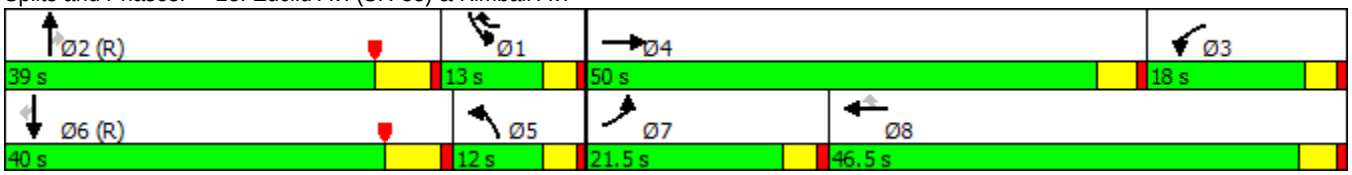
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	29.0	60.6		8.8	5.1	84.5		21.6
Change Period (Y+Rc), s	4.5	6.0		5.0	4.5	6.0		5.0
Max Green Setting (Gmax), s	24.5	29.0		5.0	10.0	43.5		41.0
Max Q Clear Time (g_c+I1), s	26.1	56.5		4.7	2.1	27.6		15.7
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	15.7		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	36.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	277	575	319	558	589	195	1330	300	406	1275	226
Future Volume (vph)	277	575	319	558	589	195	1330	300	406	1275	226
Turn Type	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	3	8	1	5	2		1	6	
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	49.5	9.0	45.5	9.0	9.0	36.0	36.0	9.0	33.0	33.0
Total Split (s)	21.5	50.0	18.0	46.5	13.0	12.0	39.0	39.0	13.0	40.0	40.0
Total Split (%)	17.9%	41.7%	15.0%	38.8%	10.8%	10.0%	32.5%	32.5%	10.8%	33.3%	33.3%
Yellow Time (s)	3.0	3.5	3.0	3.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.5	4.0	4.5	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	14.9	35.5	15.1	35.7	45.5	9.4	41.6	41.6	9.2	41.4	41.4
Actuated g/C Ratio	0.12	0.30	0.13	0.30	0.38	0.08	0.35	0.35	0.08	0.34	0.34
v/c Ratio	0.74	0.79	0.77	0.54	0.94	1.51	0.77	0.42	1.76	0.74	0.33
Control Delay	50.7	40.5	63.2	36.7	51.4	286.1	30.1	8.6	386.6	26.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.7	40.5	63.2	36.7	51.4	286.1	30.1	8.6	386.6	26.4	5.1
LOS	D	D	E	D	D	F	C	A	F	C	A
Approach Delay		43.1		48.4			53.9			100.6	
Approach LOS		D		D			D			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 27 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.76	
Intersection Signal Delay: 64.9	Intersection LOS: E
Intersection Capacity Utilization 87.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 23: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	277	575	232	319	558	589	195	1330	300	406	1275	226
Future Volume (veh/h)	277	575	232	319	558	589	195	1330	300	406	1275	226
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1872	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	289	599	238	332	581	580	203	1385	297	423	1328	217
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	337	674	267	395	1002	749	312	1426	444	584	1446	444
Arrive On Green	0.21	0.53	0.53	0.11	0.28	0.28	0.36	0.55	0.55	0.19	0.28	0.28
Sat Flow, veh/h	3141	2526	1002	3459	3610	1615	1714	5187	1615	3141	5187	1594
Grp Volume(v), veh/h	289	428	409	332	581	580	203	1385	297	423	1328	217
Grp Sat Flow(s),veh/h/ln	1570	1805	1723	1729	1805	1615	1714	1729	1615	1570	1729	1594
Q Serve(g_s), s	10.6	25.2	25.3	11.3	16.6	9.5	11.8	31.0	15.7	15.2	29.8	10.0
Cycle Q Clear(g_c), s	10.6	25.2	25.3	11.3	16.6	9.5	11.8	31.0	15.7	15.2	29.8	10.0
Prop In Lane	1.00		0.58	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	337	481	460	395	1002	749	312	1426	444	584	1446	444
V/C Ratio(X)	0.86	0.89	0.89	0.84	0.58	0.77	0.65	0.97	0.67	0.72	0.92	0.49
Avail Cap(c_a), veh/h	458	684	653	404	1264	866	312	1426	444	584	1470	452
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.57	0.57	0.57	1.00	1.00	1.00	0.57	0.57	0.57	0.75	0.75	0.75
Uniform Delay (d), s/veh	46.2	26.4	26.4	52.1	37.3	11.7	35.0	26.5	23.1	45.9	42.0	19.6
Incr Delay (d2), s/veh	5.4	6.2	6.6	13.7	0.2	3.1	2.1	12.4	4.5	2.9	8.5	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	13.2	12.7	6.1	8.3	10.2	5.7	16.0	7.5	6.8	15.4	4.7
LnGrp Delay(d),s/veh	51.7	32.6	33.0	65.8	37.5	14.9	37.1	38.9	27.6	48.9	50.5	22.4
LnGrp LOS	D	C	C	E	D	B	D	D	C	D	D	C
Approach Vol, veh/h		1126			1493			1885			1968	
Approach Delay, s/veh		37.7			35.0			36.9			47.0	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.3	39.0	18.2	36.5	25.9	39.4	16.9	37.8
Change Period (Y+Rc), s	4.0	6.0	4.5	* 4.5	4.0	6.0	4.0	4.5
Max Green Setting (Gmax), s	9.0	33.0	14.0	* 46	8.0	34.0	17.5	42.0
Max Q Clear Time (g_c+I1), s	17.2	33.0	13.3	27.3	13.8	31.8	12.6	18.6
Green Ext Time (p_c), s	0.0	0.0	0.4	4.7	0.0	1.7	0.2	4.0

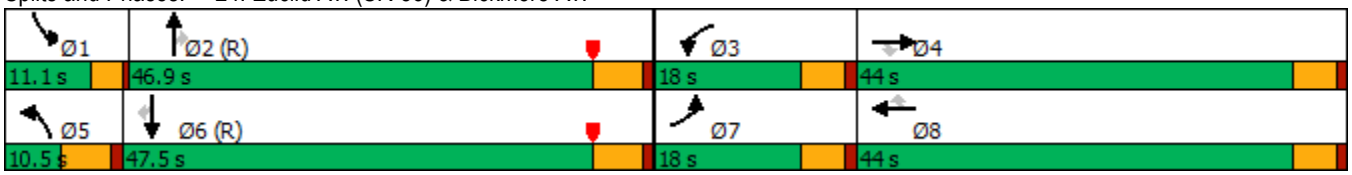
Intersection Summary	
HCM 2010 Ctrl Delay	39.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	58	60	196	18	203	15	1447	90	164	1562	47
Future Volume (vph)	175	58	60	196	18	203	15	1447	90	164	1562	47
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	44.0	44.0	10.0	44.0	44.0	10.5	26.5	26.5	8.5	30.5	30.5
Total Split (s)	18.0	44.0	44.0	18.0	44.0	44.0	10.5	46.9	46.9	11.1	47.5	47.5
Total Split (%)	15.0%	36.7%	36.7%	15.0%	36.7%	36.7%	8.8%	39.1%	39.1%	9.3%	39.6%	39.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	16.8	19.5	19.5	16.0	16.7	16.7	5.4	57.3	57.3	10.3	60.1	60.1
Actuated g/C Ratio	0.14	0.16	0.16	0.13	0.14	0.14	0.04	0.48	0.48	0.09	0.50	0.50
v/c Ratio	0.81	0.21	0.19	0.49	0.08	0.70	0.22	0.65	0.12	0.64	0.67	0.06
Control Delay	76.9	41.2	1.6	54.3	38.8	32.3	62.2	26.8	3.8	40.9	40.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.9	41.2	1.6	54.3	38.8	32.3	62.2	26.8	3.8	40.9	40.9	6.7
LOS	E	D	A	D	D	C	E	C	A	D	D	A
Approach Delay		54.3			42.9			25.8			40.0	
Approach LOS		D			D			C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 35.9	Intersection LOS: D
Intersection Capacity Utilization 64.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	58	60	196	18	203	15	1447	90	164	1562	47
Future Volume (veh/h)	175	58	60	196	18	203	15	1447	90	164	1562	47
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	194	64	48	218	20	214	17	1608	90	182	1736	52
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	2	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	186	334	284	273	285	242	71	2699	830	211	2724	831
Arrive On Green	0.11	0.18	0.18	0.08	0.15	0.15	0.04	0.52	0.52	0.02	0.17	0.17
Sat Flow, veh/h	1714	1900	1615	3326	1900	1615	1714	5187	1595	3326	5187	1582
Grp Volume(v), veh/h	194	64	48	218	20	214	17	1608	90	182	1736	52
Grp Sat Flow(s),veh/h/ln	1714	1900	1615	1663	1900	1615	1714	1729	1595	1663	1729	1582
Q Serve(g_s), s	13.0	3.4	3.0	7.7	1.1	15.6	1.2	25.9	3.4	6.5	37.3	3.3
Cycle Q Clear(g_c), s	13.0	3.4	3.0	7.7	1.1	15.6	1.2	25.9	3.4	6.5	37.3	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	334	284	273	285	242	71	2699	830	211	2724	831
V/C Ratio(X)	1.04	0.19	0.17	0.80	0.07	0.88	0.24	0.60	0.11	0.86	0.64	0.06
Avail Cap(c_a), veh/h	186	618	525	360	618	525	71	2699	830	211	2724	831
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.58	0.58	0.58
Uniform Delay (d), s/veh	53.5	42.2	42.0	54.1	43.8	50.0	55.7	20.0	14.6	58.2	39.0	24.9
Incr Delay (d2), s/veh	78.3	0.1	0.1	6.7	0.0	4.2	0.1	0.1	0.0	18.3	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	1.8	1.4	3.8	0.6	7.2	0.5	12.4	1.5	3.6	18.1	1.5
LnGrp Delay(d),s/veh	131.8	42.3	42.1	60.8	43.9	54.2	55.7	20.1	14.7	76.5	39.6	25.0
LnGrp LOS	F	D	D	E	D	D	E	C	B	E	D	C
Approach Vol, veh/h		306			452			1715			1970	
Approach Delay, s/veh		99.0			56.9			20.2			42.7	
Approach LOS		F			E			C			D	

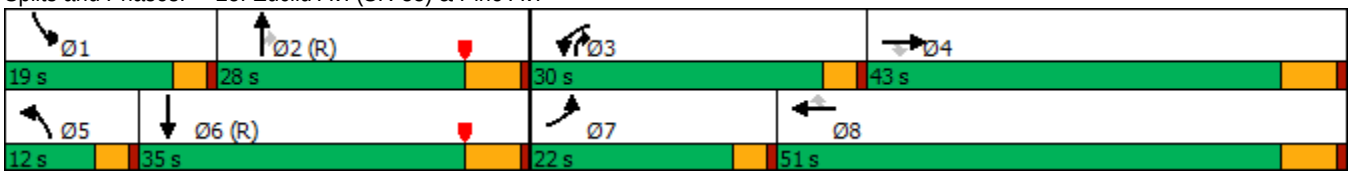
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	67.9	14.9	26.1	10.5	68.5	18.0	23.0
Change Period (Y+Rc), s	3.5	5.5	5.0	5.0	5.5	5.5	5.0	5.0
Max Green Setting (Gmax), s	7.6	41.4	13.0	39.0	5.0	42.0	13.0	39.0
Max Q Clear Time (g_c+I1), s	8.5	27.9	9.7	5.4	3.2	39.3	15.0	17.6
Green Ext Time (p_c), s	0.0	6.1	0.1	0.3	0.0	1.9	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	39.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	135	865	367	851	552	308	212	1064	770	356	1346
Future Volume (vph)	135	865	367	851	552	308	212	1064	770	356	1346
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8		5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phase	7	4	4	3	8	8	5	2	3	1	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	22.0	43.0	43.0	30.0	51.0	51.0	12.0	28.0	30.0	19.0	35.0
Total Split (%)	18.3%	35.8%	35.8%	25.0%	42.5%	42.5%	10.0%	23.3%	25.0%	15.8%	29.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min
Act Effct Green (s)	13.5	35.4	35.4	26.0	47.9	47.9	9.0	23.6	55.6	15.0	29.6
Actuated g/C Ratio	0.11	0.30	0.30	0.22	0.40	0.40	0.08	0.20	0.46	0.12	0.25
v/c Ratio	0.70	0.77	0.62	1.21	0.36	0.37	0.88	0.92	0.96	0.88	1.01
Control Delay	69.3	43.5	23.5	149.0	26.4	4.0	67.3	46.0	30.0	70.3	58.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	43.5	23.5	149.0	26.4	4.0	67.3	46.0	30.0	70.3	58.5
LOS	E	D	C	F	C	A	E	D	C	E	E
Approach Delay		40.7			83.3			42.2			60.8
Approach LOS		D			F			D			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 35 (29%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 56.9	Intersection LOS: E
Intersection Capacity Utilization 103.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 25: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	865	367	851	552	308	212	1064	770	356	1346	113
Future Volume (veh/h)	135	865	367	851	552	308	212	1064	770	356	1346	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1872	1976	1976	1768	1976	1976	1768	1976	1976	1768	1976	1976
Adj Flow Rate, veh/h	139	892	0	877	569	266	219	1097	567	367	1388	54
Adj No. of Lanes	1	2	1	2	2	1	2	3	1	2	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	166	1067	453	730	1555	661	225	1330	741	412	1586	62
Arrive On Green	0.09	0.27	0.00	0.24	0.43	0.43	0.07	0.22	0.22	0.24	0.56	0.56
Sat Flow, veh/h	1783	3952	1680	3368	3952	1680	3368	5928	1680	3368	5665	220
Grp Volume(v), veh/h	139	892	0	877	569	266	219	1097	567	367	968	474
Grp Sat Flow(s),veh/h/ln	1783	1976	1680	1684	1976	1680	1684	1976	1680	1684	1976	1934
Q Serve(g_s), s	9.2	25.5	0.0	26.0	11.6	13.1	7.8	21.1	26.9	12.6	25.4	25.4
Cycle Q Clear(g_c), s	9.2	25.5	0.0	26.0	11.6	13.1	7.8	21.1	26.9	12.6	25.4	25.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	166	1067	453	730	1555	661	225	1330	741	412	1107	541
V/C Ratio(X)	0.84	0.84	0.00	1.20	0.37	0.40	0.98	0.82	0.77	0.89	0.88	0.88
Avail Cap(c_a), veh/h	267	1219	518	730	1555	661	225	1330	741	421	1107	541
HCM Platoon Ratio	1.00	1.00	1.00	1.10	1.10	1.10	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	0.09	0.09	0.09	0.73	0.73	0.73
Uniform Delay (d), s/veh	53.5	41.3	0.0	45.7	23.9	24.3	55.9	44.3	28.3	44.6	24.6	24.6
Incr Delay (d2), s/veh	6.0	5.1	0.0	103.7	0.2	0.6	12.7	0.6	0.7	15.3	7.4	13.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	14.6	0.0	22.6	6.4	6.1	4.0	11.6	15.9	6.7	14.6	15.2
LnGrp Delay(d),s/veh	59.5	46.4	0.0	149.4	24.1	24.9	68.6	44.9	29.0	59.9	32.0	38.3
LnGrp LOS	E	D		F	C	C	E	D	C	E	C	D
Approach Vol, veh/h		1031			1712			1883			1809	
Approach Delay, s/veh		48.1			88.4			42.8			39.3	
Approach LOS		D			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	32.9	30.0	38.4	12.0	39.6	15.2	53.2
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	15.0	22.0	26.0	37.0	8.0	29.0	18.0	45.0
Max Q Clear Time (g_c+I1), s	14.6	28.9	28.0	27.5	9.8	27.4	11.2	15.1
Green Ext Time (p_c), s	0.0	0.0	0.0	4.9	0.0	1.0	0.1	7.1

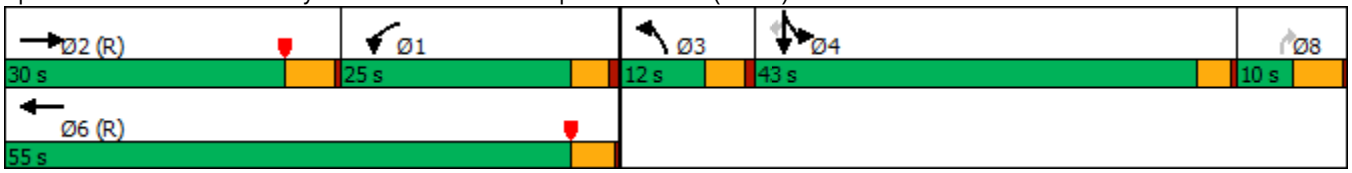
Intersection Summary	
HCM 2010 Ctrl Delay	54.8
HCM 2010 LOS	D

Notes

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	415	115	825	35	18	714	164	102
Future Volume (vph)	415	115	825	35	18	714	164	102
Turn Type	NA	Prot	NA	Prot	Perm	Split	NA	Perm
Protected Phases	2	1	6	3		4	4	
Permitted Phases					8			4
Detector Phase	2	1	6	3	8	4	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	26.5	9.5	10.0	32.5	32.5	32.5
Total Split (s)	30.0	25.0	55.0	12.0	10.0	43.0	43.0	43.0
Total Split (%)	25.0%	20.8%	45.8%	10.0%	8.3%	35.8%	35.8%	35.8%
Yellow Time (s)	4.5	3.5	4.0	3.5	4.5	3.0	3.0	3.0
All-Red Time (s)	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.5	4.5	4.5	5.0	3.5	3.5	3.5
Lead/Lag	Lead	Lag		Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes		Yes	Yes	Yes
Recall Mode	C-Min	None	C-Max	None	Min	Min	Min	Min
Act Effct Green (s)	29.3	26.8	61.2	7.0	5.0	33.6	33.6	33.6
Actuated g/C Ratio	0.24	0.22	0.51	0.06	0.04	0.28	0.28	0.28
v/c Ratio	0.55	0.31	0.46	0.37	0.10	0.79	0.32	0.19
Control Delay	42.7	33.8	13.4	64.8	1.0	46.4	34.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	33.8	13.4	64.8	1.0	46.4	34.8	2.4
LOS	D	C	B	E	A	D	C	A
Approach Delay	42.7		15.9				39.9	
Approach LOS	D		B				D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 74 (62%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 27: Shady View Dr./SR-71 SB Ramps & Euclid Av. (SR-83)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	415	50	115	825	0	35	0	18	714	164	102
Future Volume (veh/h)	0	415	50	115	825	0	35	0	18	714	164	102
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1800	1900	0	1800	0	1900	1800	1900	1900
Adj Flow Rate, veh/h	0	428	52	119	851	0	36	0	19	736	169	105
Adj No. of Lanes	0	2	0	1	2	0	1	0	1	2	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	501	61	825	2446	0	0	0	0	850	486	413
Arrive On Green	0.00	0.15	0.15	0.96	1.00	0.00	0.00	0.00	0.00	0.26	0.26	0.26
Sat Flow, veh/h	0	3339	392	1714	3705	0		0		3326	1900	1615
Grp Volume(v), veh/h	0	237	243	119	851	0		0.0		736	169	105
Grp Sat Flow(s),veh/h/ln	0	1805	1831	1714	1805	0				1663	1900	1615
Q Serve(g_s), s	0.0	15.3	15.5	0.4	0.0	0.0				25.4	8.7	6.2
Cycle Q Clear(g_c), s	0.0	15.3	15.5	0.4	0.0	0.0				25.4	8.7	6.2
Prop In Lane	0.00		0.21	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	279	283	825	2446	0				850	486	413
V/C Ratio(X)	0.00	0.85	0.86	0.14	0.35	0.00				0.87	0.35	0.25
Avail Cap(c_a), veh/h	0	376	381	825	2446	0				1095	625	532
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	49.4	49.5	1.2	0.0	0.0				42.7	36.5	35.5
Incr Delay (d2), s/veh	0.0	26.4	27.1	0.1	0.4	0.0				6.0	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.7	10.0	0.2	0.1	0.0				12.4	4.7	2.8
LnGrp Delay(d),s/veh	0.0	75.8	76.6	1.2	0.4	0.0				48.7	36.9	35.9
LnGrp LOS		E	E	A	A					D	D	D
Approach Vol, veh/h		480			970						1010	
Approach Delay, s/veh		76.2			0.5						45.4	
Approach LOS		E			A						D	

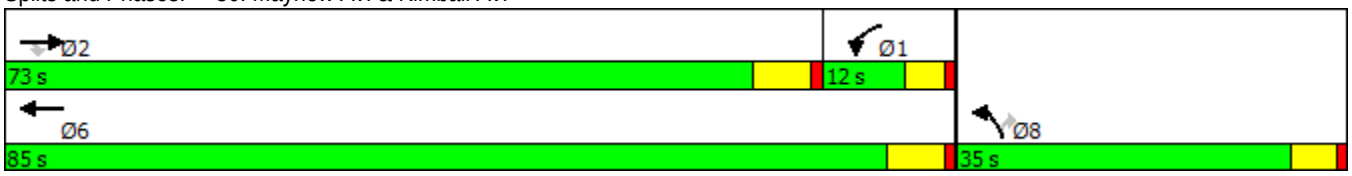
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	62.3	23.5		34.2		85.8		
Change Period (Y+Rc), s	4.5	5.0		3.5		4.5		
Max Green Setting (Gmax), s	20.5	25.0		39.5		50.5		
Max Q Clear Time (g_c+I1), s	2.4	17.5		27.4		2.0		
Green Ext Time (p_c), s	0.2	1.0		3.3		5.0		

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1361	58	4	1413	205	15
Future Volume (vph)	1361	58	4	1413	205	15
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	73.0	73.0	12.0	85.0	35.0	35.0
Total Split (%)	60.8%	60.8%	10.0%	70.8%	29.2%	29.2%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	40.8	40.8	5.6	42.0	16.6	16.6
Actuated g/C Ratio	0.57	0.57	0.08	0.59	0.23	0.23
v/c Ratio	0.71	0.07	0.03	0.72	0.56	0.04
Control Delay	13.8	2.7	43.5	12.3	33.6	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	2.7	43.5	12.3	33.6	14.5
LOS	B	A	D	B	C	B
Approach Delay	13.4			12.4	32.3	
Approach LOS	B			B	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 71.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 30: Mayhew Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1361	58	4	1413	205	15
Future Volume (veh/h)	1361	58	4	1413	205	15
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1479	63	4	1536	223	16
Adj No. of Lanes	2	1	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2019	903	11	2386	283	267
Arrive On Green	0.56	0.56	0.01	0.66	0.17	0.17
Sat Flow, veh/h	3705	1615	1714	3705	1714	1615
Grp Volume(v), veh/h	1479	63	4	1536	223	16
Grp Sat Flow(s),veh/h/ln	1805	1615	1714	1805	1714	1615
Q Serve(g_s), s	19.9	1.2	0.2	16.3	8.1	0.5
Cycle Q Clear(g_c), s	19.9	1.2	0.2	16.3	8.1	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2019	903	11	2386	283	267
V/C Ratio(X)	0.73	0.07	0.36	0.64	0.79	0.06
Avail Cap(c_a), veh/h	3707	1658	195	4373	788	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.7	6.6	32.2	6.5	26.1	22.9
Incr Delay (d2), s/veh	0.5	0.0	7.2	0.3	4.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	0.5	0.1	8.0	4.2	0.2
LnGrp Delay(d),s/veh	11.2	6.6	39.4	6.8	30.9	23.0
LnGrp LOS	B	A	D	A	C	C
Approach Vol, veh/h	1542			1540	239	
Approach Delay, s/veh	11.0			6.9	30.4	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.6	42.6				49.2		15.9
Change Period (Y+Rc), s	6.2	* 6.2				6.2		5.1
Max Green Setting (Gmax), s	7.4	* 67				78.8		29.9
Max Q Clear Time (g_c+I1), s	2.2	21.9				18.3		10.1
Green Ext Time (p_c), s	3.9	14.5				16.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.5
HCM 2010 LOS	B

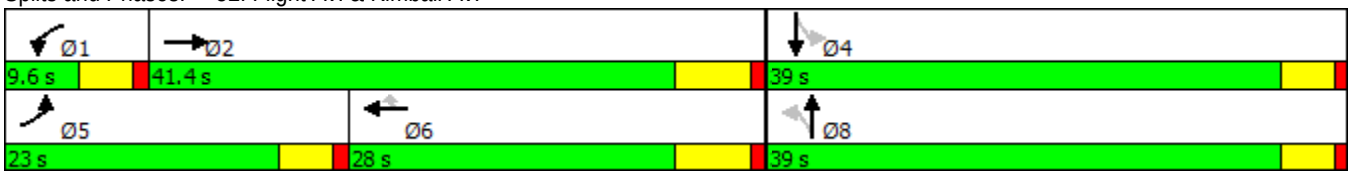
Notes

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	319	886	22	713	14	84	16	127	25
Future Volume (vph)	319	886	22	713	14	84	16	127	25
Turn Type	Prot	NA	Prot	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	24.2	31.6	31.6	31.6	31.6
Total Split (s)	23.0	41.4	9.6	28.0	28.0	39.0	39.0	39.0	39.0
Total Split (%)	25.6%	46.0%	10.7%	31.1%	31.1%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	18.4	40.4	5.0	21.2	21.2		34.4		34.4
Actuated g/C Ratio	0.21	0.45	0.06	0.24	0.24		0.38		0.38
v/c Ratio	0.96	0.65	0.24	0.89	0.03		0.38		1.01
Control Delay	77.3	22.3	47.0	47.0	0.1		24.2		68.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	77.3	22.3	47.0	47.0	0.1		24.2		68.3
LOS	E	C	D	D	A		C		E
Approach Delay		35.8		46.1			24.2		68.3
Approach LOS		D		D			C		E

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 44.7 — Intersection LOS: D
Intersection Capacity Utilization 83.2% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 52: Flight Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	319	886	93	22	713	14	84	16	22	127	25	395
Future Volume (veh/h)	319	886	93	22	713	14	84	16	22	127	25	395
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	339	943	99	23	759	15	89	17	23	135	27	420
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	360	1380	145	42	846	378	247	49	49	179	44	444
Arrive On Green	0.21	0.42	0.42	0.02	0.23	0.23	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1714	3287	345	1714	3610	1615	466	130	129	337	115	1170
Grp Volume(v), veh/h	339	518	524	23	759	15	129	0	0	582	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1827	1714	1805	1615	725	0	0	1622	0	0
Q Serve(g_s), s	17.0	20.4	20.4	1.2	17.9	0.6	0.0	0.0	0.0	18.8	0.0	0.0
Cycle Q Clear(g_c), s	17.0	20.4	20.4	1.2	17.9	0.6	11.5	0.0	0.0	30.2	0.0	0.0
Prop In Lane	1.00		0.19	1.00		1.00	0.69		0.18	0.23		0.72
Lane Grp Cap(c), veh/h	360	758	767	42	846	378	345	0	0	666	0	0
V/C Ratio(X)	0.94	0.68	0.68	0.55	0.90	0.04	0.37	0.00	0.00	0.87	0.00	0.00
Avail Cap(c_a), veh/h	360	758	767	98	899	402	360	0	0	687	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.1	20.7	20.7	42.2	32.5	25.9	19.9	0.0	0.0	25.9	0.0	0.0
Incr Delay (d2), s/veh	32.2	2.5	2.5	4.1	11.3	0.0	0.7	0.0	0.0	11.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	10.6	10.7	0.6	10.2	0.3	2.4	0.0	0.0	15.8	0.0	0.0
LnGrp Delay(d),s/veh	66.2	23.2	23.2	46.3	43.8	26.0	20.6	0.0	0.0	37.6	0.0	0.0
LnGrp LOS	E	C	C	D	D	C	C			D		
Approach Vol, veh/h		1381			797			129			582	
Approach Delay, s/veh		33.7			43.6			20.6			37.6	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	43.0		37.9	23.0	26.7		37.9
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	35.2		34.4	18.4	21.8		34.4
Max Q Clear Time (g_c+I1), s	3.2	22.4		32.2	19.0	19.9		13.5
Green Ext Time (p_c), s	0.0	8.2		1.0	0.0	0.7		5.0

Intersection Summary	
HCM 2010 Ctrl Delay	36.7
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	309	1177	22	1032	116	84	16	377	25
Future Volume (vph)	309	1177	22	1032	116	84	16	377	25
Turn Type	Prot	NA	Prot	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	24.2	31.6	31.6	31.6	31.6
Total Split (s)	28.0	64.0	10.5	46.5	46.5	45.5	45.5	45.5	45.5
Total Split (%)	23.3%	53.3%	8.8%	38.8%	38.8%	37.9%	37.9%	37.9%	37.9%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2		4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	23.4	60.8	5.6	39.0	39.0		40.0	40.0	40.0
Actuated g/C Ratio	0.20	0.52	0.05	0.33	0.33		0.34	0.34	0.34
v/c Ratio	0.97	0.74	0.29	0.92	0.21		0.64	0.97	0.82
Control Delay	89.5	26.3	64.4	51.1	9.2		49.4	75.6	49.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	89.5	26.3	64.4	51.1	9.2		49.4	75.6	49.6
LOS	F	C	E	D	A		D	E	D
Approach Delay		38.7		47.2			49.4		61.9
Approach LOS		D		D			D		E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.8	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 46.8	Intersection LOS: D
Intersection Capacity Utilization 97.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 52: Flight Av. & Kimball Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	309	1177	93	22	1032	116	84	16	22	377	25	392
Future Volume (veh/h)	309	1177	93	22	1032	116	84	16	22	377	25	392
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	329	1252	99	23	1098	123	89	17	23	401	27	417
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	340	1694	134	38	1174	525	127	26	22	491	34	520
Arrive On Green	0.20	0.50	0.50	0.02	0.33	0.33	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1714	3382	267	1714	3610	1615	219	75	64	1389	97	1500
Grp Volume(v), veh/h	329	667	684	23	1098	123	129	0	0	401	0	444
Grp Sat Flow(s),veh/h/ln	1714	1805	1844	1714	1805	1615	358	0	0	1389	0	1597
Q Serve(g_s), s	22.5	34.5	34.8	1.6	34.8	6.6	11.2	0.0	0.0	0.0	0.0	29.7
Cycle Q Clear(g_c), s	22.5	34.5	34.8	1.6	34.8	6.6	40.9	0.0	0.0	36.8	0.0	29.7
Prop In Lane	1.00		0.14	1.00		1.00	0.69		0.18	1.00		0.94
Lane Grp Cap(c), veh/h	340	904	924	38	1174	525	176	0	0	491	0	553
V/C Ratio(X)	0.97	0.74	0.74	0.60	0.94	0.23	0.73	0.00	0.00	0.82	0.00	0.80
Avail Cap(c_a), veh/h	340	904	924	86	1232	551	176	0	0	491	0	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.0	23.3	23.4	57.2	38.6	29.1	49.9	0.0	0.0	37.3	0.0	34.9
Incr Delay (d2), s/veh	40.1	3.2	3.2	5.4	12.8	0.2	14.7	0.0	0.0	10.3	0.0	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.4	17.8	18.5	0.8	19.5	3.0	4.9	0.0	0.0	14.0	0.0	14.4
LnGrp Delay(d),s/veh	87.1	26.5	26.6	62.6	51.5	29.3	64.6	0.0	0.0	47.6	0.0	43.3
LnGrp LOS	F	C	C	E	D	C	E			D		D
Approach Vol, veh/h		1680			1244			129			845	
Approach Delay, s/veh		38.4			49.5			64.6			45.3	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	65.3		45.5	28.0	44.6		45.5
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.9	57.8		40.9	23.4	40.3		40.9
Max Q Clear Time (g_c+I1), s	3.6	36.8		38.8	24.5	36.8		42.9
Green Ext Time (p_c), s	0.0	15.8		1.1	0.0	1.6		0.0

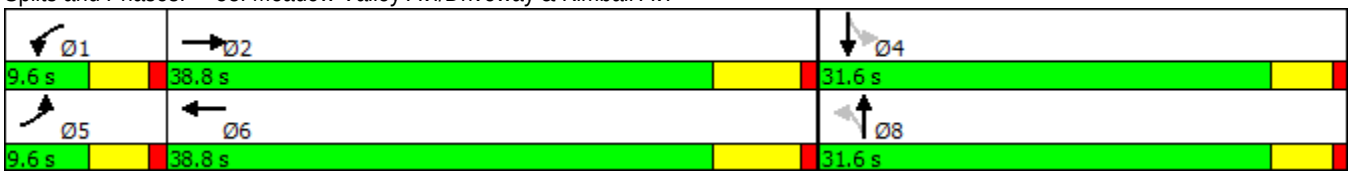
Intersection Summary	
HCM 2010 Ctrl Delay	44.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	952	23	647	30	0	11	0
Future Volume (vph)	30	952	23	647	30	0	11	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	31.6	31.6	31.6	31.6
Total Split (s)	9.6	38.8	9.6	38.8	31.6	31.6	31.6	31.6
Total Split (%)	12.0%	48.5%	12.0%	48.5%	39.5%	39.5%	39.5%	39.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.5	23.0	5.5	23.0		13.1		13.1
Actuated g/C Ratio	0.11	0.45	0.11	0.45		0.26		0.26
v/c Ratio	0.18	0.71	0.14	0.45		0.11		0.18
Control Delay	30.9	15.4	30.7	11.9		0.9		4.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	30.9	15.4	30.7	11.9		0.9		4.6
LOS	C	B	C	B		A		A
Approach Delay		15.8		12.5		0.9		4.6
Approach LOS		B		B		A		A

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 50.8
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 13.8 — Intersection LOS: B
Intersection Capacity Utilization 46.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 53: Meadow Valley Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	952	52	23	647	2	30	0	15	11	0	71
Future Volume (veh/h)	30	952	52	23	647	2	30	0	15	11	0	71
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	33	1082	59	26	735	2	34	0	17	12	0	77
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.88	0.88	0.88	0.88	0.92	0.88	0.92	0.88	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	63	1660	90	52	1740	5	295	23	101	98	24	273
Arrive On Green	0.04	0.48	0.48	0.03	0.47	0.47	0.19	0.00	0.19	0.19	0.00	0.19
Sat Flow, veh/h	1714	3476	189	1714	3693	10	920	119	520	96	123	1407
Grp Volume(v), veh/h	33	562	579	26	359	378	51	0	0	89	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1861	1714	1805	1898	1559	0	0	1626	0	0
Q Serve(g_s), s	1.0	12.2	12.2	0.8	6.8	6.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	12.2	12.2	0.8	6.8	6.8	1.2	0.0	0.0	2.4	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.01	0.67		0.33	0.13		0.87
Lane Grp Cap(c), veh/h	63	862	889	52	850	894	418	0	0	394	0	0
V/C Ratio(X)	0.53	0.65	0.65	0.50	0.42	0.42	0.12	0.00	0.00	0.23	0.00	0.00
Avail Cap(c_a), veh/h	166	1140	1176	166	1140	1199	905	0	0	921	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.4	10.2	10.2	24.6	9.0	9.0	17.3	0.0	0.0	17.7	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.8	0.8	2.8	0.3	0.3	0.1	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	6.1	6.3	0.4	3.4	3.5	0.6	0.0	0.0	1.1	0.0	0.0
LnGrp Delay(d),s/veh	27.0	11.1	11.0	27.4	9.3	9.3	17.4	0.0	0.0	18.0	0.0	0.0
LnGrp LOS	C	B	B	C	A	A	B			B		
Approach Vol, veh/h		1174			763			51			89	
Approach Delay, s/veh		11.5			9.9			17.4			18.0	
Approach LOS		B			A			B			B	

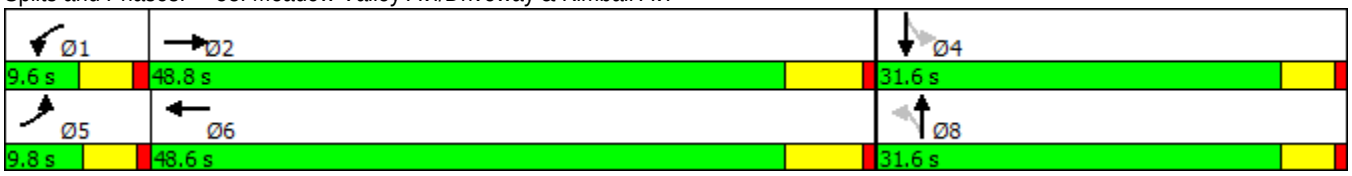
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	30.8		14.6	6.5	30.5		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	32.6		27.0	5.0	32.6		27.0
Max Q Clear Time (g_c+I1), s	2.8	14.2		4.4	3.0	8.8		3.2
Green Ext Time (p_c), s	0.0	10.5		0.8	0.0	12.1		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	1493	23	1069	30	0	11	0
Future Volume (vph)	30	1493	23	1069	30	0	11	0
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	24.2	9.6	24.2	31.6	31.6	31.6	31.6
Total Split (s)	9.8	48.8	9.6	48.6	31.6	31.6	31.6	31.6
Total Split (%)	10.9%	54.2%	10.7%	54.0%	35.1%	35.1%	35.1%	35.1%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	5.2	43.4	5.1	43.3		12.9		12.9
Actuated g/C Ratio	0.07	0.61	0.07	0.61		0.18		0.18
v/c Ratio	0.26	0.80	0.21	0.55		0.15		0.24
Control Delay	40.5	16.7	39.5	11.2		2.2		7.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	40.5	16.7	39.5	11.2		2.2		7.1
LOS	D	B	D	B		A		A
Approach Delay		17.2		11.8		2.2		7.1
Approach LOS		B		B		A		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 70.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 53: Meadow Valley Av./Driveway & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1493	52	23	1069	2	30	0	15	11	0	71
Future Volume (veh/h)	30	1493	52	23	1069	2	30	0	15	11	0	71
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	33	1697	59	26	1215	2	34	0	17	12	0	77
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.88	0.88	0.88	0.88	0.92	0.88	0.92	0.88	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	58	2127	74	49	2191	4	227	18	78	75	17	207
Arrive On Green	0.03	0.60	0.60	0.03	0.59	0.59	0.15	0.00	0.15	0.15	0.00	0.15
Sat Flow, veh/h	1714	3557	123	1714	3698	6	943	119	531	105	114	1405
Grp Volume(v), veh/h	33	858	898	26	593	624	51	0	0	89	0	0
Grp Sat Flow(s),veh/h/ln	1714	1805	1875	1714	1805	1899	1593	0	0	1624	0	0
Q Serve(g_s), s	1.3	24.7	25.2	1.0	13.6	13.6	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	24.7	25.2	1.0	13.6	13.6	1.7	0.0	0.0	3.3	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.00	0.67		0.33	0.13		0.87
Lane Grp Cap(c), veh/h	58	1080	1121	49	1069	1125	322	0	0	299	0	0
V/C Ratio(X)	0.56	0.79	0.80	0.53	0.55	0.55	0.16	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	131	1130	1174	126	1125	1184	692	0	0	698	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.4	10.5	10.6	32.6	8.4	8.4	25.5	0.0	0.0	26.2	0.0	0.0
Incr Delay (d2), s/veh	3.2	3.8	3.9	3.3	0.5	0.5	0.2	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	13.3	13.9	0.5	6.8	7.1	0.9	0.0	0.0	1.6	0.0	0.0
LnGrp Delay(d),s/veh	35.5	14.3	14.5	35.9	9.0	8.9	25.7	0.0	0.0	26.7	0.0	0.0
LnGrp LOS	D	B	B	D	A	A	C			C		
Approach Vol, veh/h		1789			1243			51			89	
Approach Delay, s/veh		14.8			9.5			25.7			26.7	
Approach LOS		B			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.5	46.9		14.6	6.9	46.5		14.6
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6
Max Green Setting (Gmax), s	5.0	42.6		27.0	5.2	42.4		27.0
Max Q Clear Time (g_c+I1), s	3.0	27.2		5.3	3.3	15.6		3.7
Green Ext Time (p_c), s	0.0	13.5		0.8	0.0	21.8		0.8

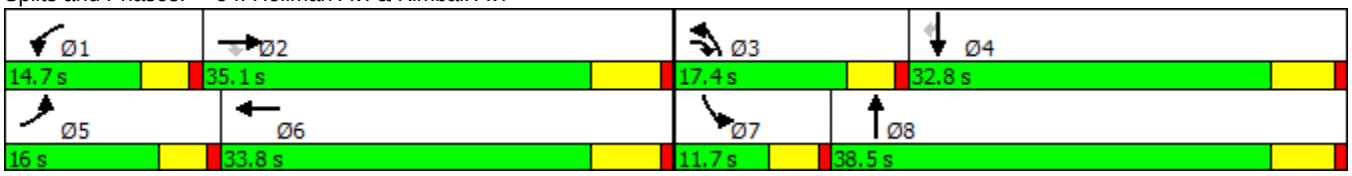
Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	186	299	494	110	341	208	175	43	367	124
Future Volume (vph)	186	299	494	110	341	208	175	43	367	124
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	5	2	3	1	6	3	8	7	4	
Permitted Phases			2							4
Detector Phase	5	2	3	1	6	3	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	9.6	33.2	9.6	32.8	9.6	32.8	32.8
Total Split (s)	16.0	35.1	17.4	14.7	33.8	17.4	38.5	11.7	32.8	32.8
Total Split (%)	16.0%	35.1%	17.4%	14.7%	33.8%	17.4%	38.5%	11.7%	32.8%	32.8%
Yellow Time (s)	3.6	5.2	3.6	3.6	5.2	3.6	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	4.6	6.2	4.6	5.8	4.6	5.8	5.8
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	11.6	24.9	39.6	9.0	22.4	13.0	27.1	6.3	15.9	15.9
Actuated g/C Ratio	0.14	0.30	0.47	0.11	0.27	0.15	0.32	0.07	0.19	0.19
v/c Ratio	0.85	0.57	0.63	0.64	0.81	0.85	0.29	0.36	0.58	0.30
Control Delay	71.1	31.0	13.5	56.1	43.4	67.2	13.5	48.9	35.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.1	31.0	13.5	56.1	43.4	67.2	13.5	48.9	35.0	3.2
LOS	E	C	B	E	D	E	B	D	C	A
Approach Delay		29.8			46.3		34.5		28.7	
Approach LOS		C			D		C		C	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 84.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 33.8 — Intersection LOS: C
Intersection Capacity Utilization 71.0% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 54: Hellman Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	299	494	110	341	37	208	175	148	43	367	124
Future Volume (veh/h)	186	299	494	110	341	37	208	175	148	43	367	124
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	200	322	531	118	367	40	224	188	159	46	395	133
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	235	620	764	147	464	51	259	554	443	68	645	284
Arrive On Green	0.14	0.33	0.33	0.09	0.28	0.28	0.15	0.29	0.29	0.04	0.18	0.18
Sat Flow, veh/h	1714	1900	1592	1714	1684	184	1714	1910	1526	1714	3610	1590
Grp Volume(v), veh/h	200	322	531	118	0	407	224	177	170	46	395	133
Grp Sat Flow(s),veh/h/ln	1714	1900	1592	1714	0	1868	1714	1805	1631	1714	1805	1590
Q Serve(g_s), s	9.4	11.3	21.5	5.6	0.0	16.6	10.5	6.3	6.8	2.2	8.3	6.2
Cycle Q Clear(g_c), s	9.4	11.3	21.5	5.6	0.0	16.6	10.5	6.3	6.8	2.2	8.3	6.2
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	235	620	764	147	0	515	259	524	473	68	645	284
V/C Ratio(X)	0.85	0.52	0.70	0.80	0.00	0.79	0.86	0.34	0.36	0.68	0.61	0.47
Avail Cap(c_a), veh/h	238	668	804	211	0	627	267	718	649	148	1186	522
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	22.5	16.8	36.9	0.0	27.6	34.1	23.0	23.1	39.0	31.1	30.3
Incr Delay (d2), s/veh	23.2	0.7	2.5	8.5	0.0	5.6	22.7	0.4	0.5	4.4	0.9	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	6.0	9.8	3.0	0.0	9.3	6.6	3.2	3.1	1.1	4.2	2.8
LnGrp Delay(d),s/veh	57.9	23.1	19.3	45.4	0.0	33.2	56.8	23.3	23.6	43.3	32.1	31.5
LnGrp LOS	E	C	B	D		C	E	C	C	D	C	C
Approach Vol, veh/h		1053			525			571			574	
Approach Delay, s/veh		27.8			36.0			36.5			32.9	
Approach LOS		C			D			D			C	

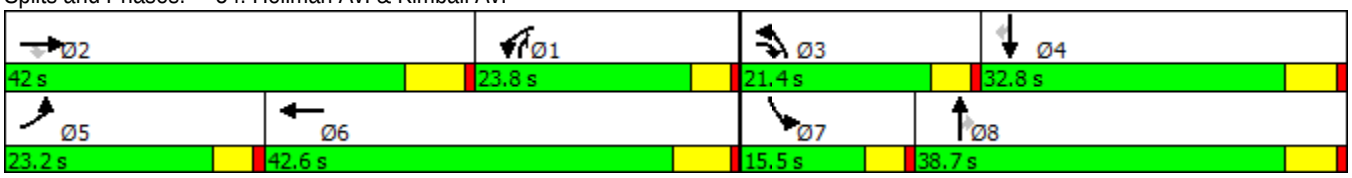
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	33.0	17.0	20.5	15.9	28.9	7.9	29.7
Change Period (Y+Rc), s	4.6	6.2	4.6	5.8	4.6	6.2	4.6	5.8
Max Green Setting (Gmax), s	10.1	28.9	12.8	27.0	11.4	27.6	7.1	32.7
Max Q Clear Time (g_c+I1), s	7.6	23.5	12.5	10.3	11.4	18.6	4.2	8.8
Green Ext Time (p_c), s	0.0	2.8	0.0	4.4	0.0	4.1	0.0	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	32.3
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	186	1060	274	503	768	202	175	448	43	367	124
Future Volume (vph)	186	1060	274	503	768	202	175	448	43	367	124
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2	3	1	6	3	8	1	7	4	
Permitted Phases			2					8			4
Detector Phase	5	2	3	1	6	3	8	1	7	4	4
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	10.0
Minimum Split (s)	9.6	33.2	9.6	9.6	33.2	9.6	32.8	9.6	9.6	32.8	32.8
Total Split (s)	23.2	42.0	21.4	23.8	42.6	21.4	38.7	23.8	15.5	32.8	32.8
Total Split (%)	19.3%	35.0%	17.8%	19.8%	35.5%	17.8%	32.3%	19.8%	12.9%	27.3%	27.3%
Yellow Time (s)	3.6	5.2	3.6	3.6	5.2	3.6	4.8	3.6	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	4.6	6.2	4.6	5.8	4.6	4.6	5.8	5.8
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min	Min
Act Effct Green (s)	16.0	35.9	53.7	19.3	39.1	16.2	29.0	50.5	7.5	18.2	18.2
Actuated g/C Ratio	0.14	0.32	0.48	0.17	0.35	0.15	0.26	0.46	0.07	0.16	0.16
v/c Ratio	0.81	0.98	0.36	0.94	0.68	0.87	0.20	0.59	0.40	0.66	0.30
Control Delay	71.0	59.2	8.0	71.6	35.3	79.0	33.5	13.5	60.7	49.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.0	59.2	8.0	71.6	35.3	79.0	33.5	13.5	60.7	49.1	2.0
LOS	E	E	A	E	D	E	C	B	E	D	A
Approach Delay		51.4			49.3		33.7			39.1	
Approach LOS		D			D		C			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 110.9	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 45.7	Intersection LOS: D
Intersection Capacity Utilization 84.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 54: Hellman Av. & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	1060	274	503	768	37	202	175	448	43	367	124
Future Volume (veh/h)	186	1060	274	503	768	37	202	175	448	43	367	124
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	200	1140	295	541	826	40	217	188	482	46	395	133
Adj No. of Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	228	1152	738	569	1303	63	244	983	716	58	592	261
Arrive On Green	0.13	0.32	0.32	0.17	0.37	0.37	0.14	0.27	0.27	0.03	0.16	0.16
Sat Flow, veh/h	1714	3610	1592	3326	3505	170	1714	3610	1615	1714	3610	1589
Grp Volume(v), veh/h	200	1140	295	541	425	441	217	188	482	46	395	133
Grp Sat Flow(s),veh/h/ln	1714	1805	1592	1663	1805	1870	1714	1805	1615	1714	1805	1589
Q Serve(g_s), s	12.8	35.2	5.5	18.1	21.7	21.7	13.9	4.5	3.6	3.0	11.5	8.6
Cycle Q Clear(g_c), s	12.8	35.2	5.5	18.1	21.7	21.7	13.9	4.5	3.6	3.0	11.5	8.6
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	1152	738	569	671	695	244	983	716	58	592	261
V/C Ratio(X)	0.88	0.99	0.40	0.95	0.63	0.63	0.89	0.19	0.67	0.79	0.67	0.51
Avail Cap(c_a), veh/h	284	1152	738	569	671	695	257	1059	750	167	869	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.7	38.0	6.7	46.0	29.0	29.0	47.2	31.3	11.7	53.8	44.0	42.8
Incr Delay (d2), s/veh	19.1	23.8	0.4	25.6	2.0	1.9	27.5	0.1	2.2	8.6	1.3	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	21.4	2.8	10.3	11.1	11.5	8.4	2.3	8.3	1.6	5.9	3.9
LnGrp Delay(d),s/veh	66.9	61.8	7.1	71.6	30.9	30.8	74.7	31.4	13.9	62.3	45.3	44.3
LnGrp LOS	E	E	A	E	C	C	E	C	B	E	D	D
Approach Vol, veh/h		1635			1407			887			574	
Approach Delay, s/veh		52.6			46.5			32.5			46.4	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.4	42.0	20.6	24.2	19.5	47.9	8.4	36.3
Change Period (Y+Rc), s	6.2	* 6.2	4.6	5.8	4.6	6.2	4.6	5.8
Max Green Setting (Gmax), s	19.2	* 36	16.8	27.0	18.6	36.4	10.9	32.9
Max Q Clear Time (g_c+I1), s	20.1	37.2	15.9	13.5	14.8	23.7	5.0	6.5
Green Ext Time (p_c), s	0.0	0.0	0.0	4.9	0.1	4.8	0.0	6.2

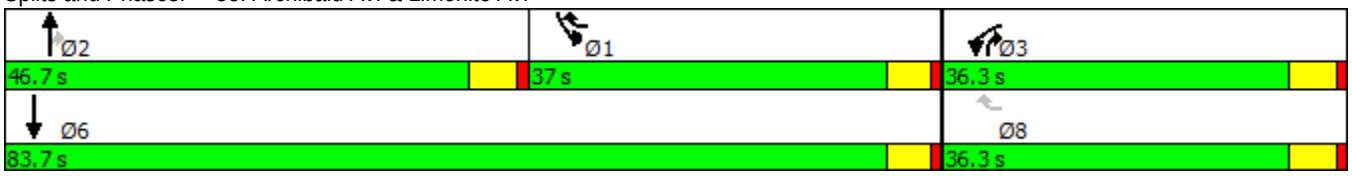
Intersection Summary	
HCM 2010 Ctrl Delay	45.9
HCM 2010 LOS	D

Notes

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø8
Lane Configurations							
Traffic Volume (vph)	744	886	1439	730	1090	1978	
Future Volume (vph)	744	886	1439	730	1090	1978	
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA	
Protected Phases	3	1	2	3	1	6	8
Permitted Phases		8		2			
Detector Phase	3	1	2	3	1	6	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	36.3	11.0	46.3	36.3	11.0	11.0	36.3
Total Split (s)	36.3	37.0	46.7	36.3	37.0	83.7	36.3
Total Split (%)	30.3%	30.8%	38.9%	30.3%	30.8%	69.8%	30%
Yellow Time (s)	4.3	4.0	4.3	4.3	4.0	4.0	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.0	5.3	5.3	5.0	5.0	
Lead/Lag		Lag	Lead		Lag		
Lead-Lag Optimize?		Yes	Yes		Yes		
Recall Mode	None	None	Min	None	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 119.7
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	744	0	886	0	1439	730	1090	1978	0
Future Volume (veh/h)	0	0	0	744	0	886	0	1439	730	1090	1978	0
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	0	1900	0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h				836	0	954	0	1617	820	1225	2222	0
Adj No. of Lanes				2	0	2	0	3	1	2	3	0
Peak Hour Factor				0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				895	0	1489	0	1790	969	944	3416	0
Arrive On Green				0.25	0.00	0.25	0.00	0.35	0.35	0.27	0.66	0.00
Sat Flow, veh/h				3510	0	2842	0	5358	1615	3510	5358	0
Grp Volume(v), veh/h				836	0	954	0	1617	820	1225	2222	0
Grp Sat Flow(s),veh/h/ln				1755	0	1421	0	1729	1615	1755	1729	0
Q Serve(g_s), s				27.7	0.0	0.0	0.0	35.3	7.8	32.0	30.4	0.0
Cycle Q Clear(g_c), s				27.7	0.0	0.0	0.0	35.3	7.8	32.0	30.4	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h				895	0	1489	0	1790	969	944	3416	0
V/C Ratio(X)				0.93	0.00	0.64	0.00	0.90	0.85	1.30	0.65	0.00
Avail Cap(c_a), veh/h				915	0	1505	0	1805	973	944	3431	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				43.4	0.0	20.3	0.0	37.1	11.7	43.5	12.1	0.0
Incr Delay (d2), s/veh				15.8	0.0	0.7	0.0	6.9	7.1	141.7	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.4	0.0	11.3	0.0	17.9	5.0	34.1	14.5	0.0
LnGrp Delay(d),s/veh				59.1	0.0	21.0	0.0	43.9	18.8	185.2	12.5	0.0
LnGrp LOS				E		C		D	B	F	B	
Approach Vol, veh/h					1790			2437			3447	
Approach Delay, s/veh					38.8			35.5			73.9	
Approach LOS					D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	37.0	46.4				83.4		35.6
Change Period (Y+Rc), s	5.0	5.3				5.0		5.3
Max Green Setting (Gmax), s	32.0	41.4				78.7		31.0
Max Q Clear Time (g_c+I1), s	34.0	37.3				32.4		29.7
Green Ext Time (p_c), s	0.0	3.8				29.5		0.6

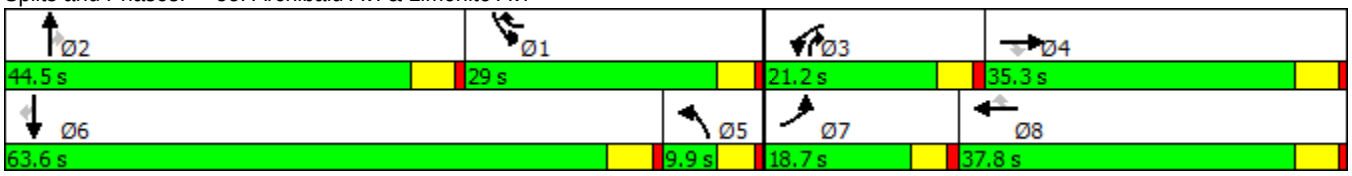
Intersection Summary	
HCM 2010 Ctrl Delay	53.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	760	108	444	618	1176	82	1439	380	703	1978	237
Future Volume (vph)	285	760	108	444	618	1176	82	1439	380	703	1978	237
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	6.0	6.0
Minimum Split (s)	9.6	35.3	35.3	9.6	35.3	9.6	9.6	43.3	9.6	9.6	43.3	43.3
Total Split (s)	18.7	35.3	35.3	21.2	37.8	29.0	9.9	44.5	21.2	29.0	63.6	63.6
Total Split (%)	14.4%	27.2%	27.2%	16.3%	29.1%	22.3%	7.6%	34.2%	16.3%	22.3%	48.9%	48.9%
Yellow Time (s)	3.6	4.3	4.3	3.6	4.3	3.6	3.6	4.3	3.6	3.6	4.3	4.3
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.3	5.3	4.6	5.3	4.6	4.6	5.3	4.6	4.6	5.3	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 129.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 55: Archibald Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	760	108	444	618	1176	82	1439	380	703	1978	237
Future Volume (veh/h)	285	760	108	444	618	1176	82	1439	380	703	1978	237
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1976	1976	1976	1976	1976	1976	1900	1976	1900	1976	1976	1900
Adj Flow Rate, veh/h	310	826	63	483	672	735	89	1564	250	764	2150	149
Adj No. of Lanes	2	2	1	2	2	2	2	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	363	866	388	466	973	1501	165	1626	693	707	2385	714
Arrive On Green	0.10	0.23	0.23	0.13	0.26	0.26	0.05	0.30	0.30	0.19	0.44	0.44
Sat Flow, veh/h	3651	3754	1680	3651	3754	3359	3510	5394	1615	3764	5394	1615
Grp Volume(v), veh/h	310	826	63	483	672	735	89	1564	250	764	2150	149
Grp Sat Flow(s),veh/h/ln	1825	1877	1680	1825	1877	1680	1755	1798	1615	1882	1798	1615
Q Serve(g_s), s	10.9	28.2	3.3	16.6	21.0	4.9	3.2	37.1	6.5	24.4	48.0	5.0
Cycle Q Clear(g_c), s	10.9	28.2	3.3	16.6	21.0	4.9	3.2	37.1	6.5	24.4	48.0	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	363	866	388	466	973	1501	165	1626	693	707	2385	714
V/C Ratio(X)	0.85	0.95	0.16	1.04	0.69	0.49	0.54	0.96	0.36	1.08	0.90	0.21
Avail Cap(c_a), veh/h	396	866	388	466	973	1501	165	1627	693	707	2419	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.6	49.3	28.2	56.7	43.5	11.3	60.6	44.7	9.5	52.8	33.6	10.5
Incr Delay (d2), s/veh	14.3	19.9	0.1	51.3	1.8	0.1	1.9	14.3	0.4	58.0	5.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	17.0	1.5	11.7	11.2	5.7	1.6	20.5	2.9	18.3	25.0	2.3
LnGrp Delay(d),s/veh	71.9	69.2	28.3	108.0	45.2	11.3	62.5	59.0	9.9	110.8	38.8	10.6
LnGrp LOS	E	E	C	F	D	B	E	E	A	F	D	B
Approach Vol, veh/h		1199			1890			1903			3063	
Approach Delay, s/veh		67.8			48.1			52.7			55.4	
Approach LOS		E			D			D			E	

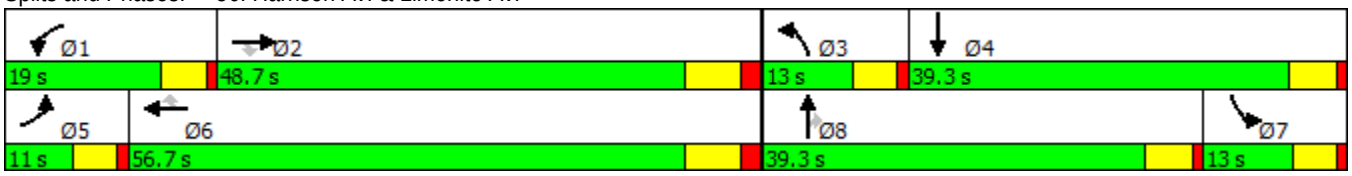
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.0	44.5	21.2	35.3	10.7	62.8	17.5	39.0
Change Period (Y+Rc), s	4.6	5.3	4.6	5.3	4.6	5.3	4.6	5.3
Max Green Setting (Gmax), s	24.4	39.2	16.6	30.0	5.3	58.3	14.1	32.5
Max Q Clear Time (g_c+I1), s	26.4	39.1	18.6	30.2	5.2	50.0	12.9	23.0
Green Ext Time (p_c), s	0.0	0.1	0.0	0.0	0.0	7.4	0.1	5.7

Intersection Summary	
HCM 2010 Ctrl Delay	54.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	78	1932	210	251	1953	93	135	58	157	109	109
Future Volume (vph)	78	1932	210	251	1953	93	135	58	157	109	109
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases			2			6			8		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0
Minimum Split (s)	10.0	29.0	29.0	10.0	29.0	29.0	10.0	39.3	39.3	10.0	39.3
Total Split (s)	11.0	48.7	48.7	19.0	56.7	56.7	13.0	39.3	39.3	13.0	39.3
Total Split (%)	9.2%	40.6%	40.6%	15.8%	47.3%	47.3%	10.8%	32.8%	32.8%	10.8%	32.8%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	4.3	4.3	4.0	4.3
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	5.3	5.3	5.0	5.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 106.7
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 56: Harrison Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1932	210	251	1953	93	135	58	157	109	109	144
Future Volume (veh/h)	78	1932	210	251	1953	93	135	58	157	109	109	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	2147	232	279	2170	103	150	64	145	121	121	153
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	103	2055	626	241	2449	762	138	178	149	294	139	175
Arrive On Green	0.06	0.40	0.40	0.13	0.47	0.47	0.08	0.09	0.09	0.16	0.18	0.18
Sat Flow, veh/h	1810	5187	1581	1810	5187	1615	1810	1900	1588	1810	758	958
Grp Volume(v), veh/h	87	2147	232	279	2170	103	150	64	145	121	0	274
Grp Sat Flow(s),veh/h/ln	1810	1729	1581	1810	1729	1615	1810	1900	1588	1810	0	1716
Q Serve(g_s), s	5.0	41.7	10.9	14.0	40.0	1.8	8.0	3.3	7.1	6.3	0.0	16.3
Cycle Q Clear(g_c), s	5.0	41.7	10.9	14.0	40.0	1.8	8.0	3.3	7.1	6.3	0.0	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	103	2055	626	241	2449	762	138	178	149	294	0	314
V/C Ratio(X)	0.84	1.04	0.37	1.16	0.89	0.14	1.09	0.36	0.97	0.41	0.00	0.87
Avail Cap(c_a), veh/h	103	2055	626	241	2449	762	138	614	513	294	0	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.2	31.8	22.5	45.6	25.2	3.5	48.6	44.7	26.4	39.6	0.0	41.8
Incr Delay (d2), s/veh	42.0	32.8	0.4	107.9	4.3	0.1	103.1	1.2	28.4	0.3	0.0	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	26.0	4.8	14.2	19.9	1.6	7.9	1.8	5.0	3.2	0.0	8.4
LnGrp Delay(d),s/veh	91.1	64.6	22.9	153.5	29.5	3.6	151.8	46.0	54.8	39.9	0.0	49.3
LnGrp LOS	F	F	C	F	C	A	F	D	D	D		D
Approach Vol, veh/h		2466			2552			359			395	
Approach Delay, s/veh		61.6			42.1			93.8			46.4	
Approach LOS		E			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	48.7	13.0	24.6	11.0	56.7	22.4	15.2
Change Period (Y+Rc), s	5.0	7.0	5.0	5.3	5.0	7.0	5.3	* 5.3
Max Green Setting (Gmax), s	14.0	41.7	8.0	34.0	6.0	49.7	8.0	* 34
Max Q Clear Time (g_c+I1), s	16.0	43.7	10.0	18.3	7.0	42.0	8.3	9.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.0	7.7	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	53.9
HCM 2010 LOS	D

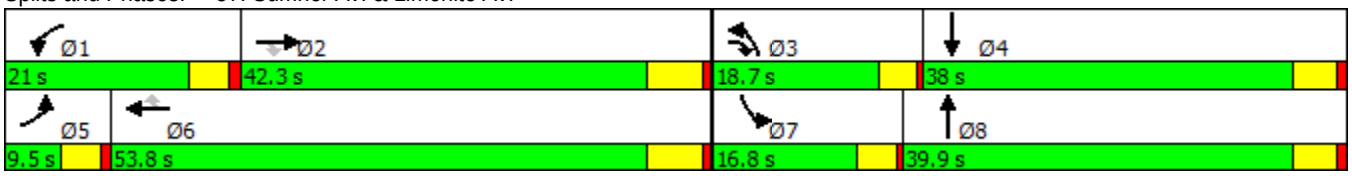
Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	114	1617	541	489	1879	66	422	79	93	166
Future Volume (vph)	114	1617	541	489	1879	66	422	79	93	166
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	5	2	3	1	6		3	8	7	4
Permitted Phases			2			6				
Detector Phase	5	2	3	1	6	6	3	8	7	4
Switch Phase										
Minimum Initial (s)	4.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Minimum Split (s)	9.5	32.0	9.5	9.5	29.0	29.0	9.5	38.0	9.5	38.0
Total Split (s)	9.5	42.3	18.7	21.0	53.8	53.8	18.7	39.9	16.8	38.0
Total Split (%)	7.9%	35.3%	15.6%	17.5%	44.8%	44.8%	15.6%	33.3%	14.0%	31.7%
Yellow Time (s)	3.5	5.0	3.5	3.5	5.0	5.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	1.0	0.5	1.0	1.0	1.0	0.5	1.0	0.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.5	6.0	6.0	4.0	5.0	4.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 101
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 57: Sumner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	1617	541	489	1879	66	422	79	321	93	166	88
Future Volume (veh/h)	114	1617	541	489	1879	66	422	79	321	93	166	88
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	118	1667	552	504	1937	47	435	81	257	96	171	64
Adj No. of Lanes	2	3	1	2	3	1	2	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	1909	823	567	2484	773	499	371	330	122	338	122
Arrive On Green	0.05	0.37	0.37	0.16	0.48	0.48	0.14	0.21	0.21	0.07	0.13	0.13
Sat Flow, veh/h	3510	5187	1612	3510	5187	1614	3510	1805	1608	1810	2588	931
Grp Volume(v), veh/h	118	1667	552	504	1937	47	435	81	257	96	117	118
Grp Sat Flow(s),veh/h/ln	1755	1729	1612	1755	1729	1614	1755	1805	1608	1810	1805	1714
Q Serve(g_s), s	3.3	29.5	25.2	13.9	30.7	1.5	12.0	3.7	14.9	5.2	6.0	6.3
Cycle Q Clear(g_c), s	3.3	29.5	25.2	13.9	30.7	1.5	12.0	3.7	14.9	5.2	6.0	6.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.54
Lane Grp Cap(c), veh/h	178	1909	823	567	2484	773	499	371	330	122	236	224
V/C Ratio(X)	0.66	0.87	0.67	0.89	0.78	0.06	0.87	0.22	0.78	0.79	0.50	0.53
Avail Cap(c_a), veh/h	178	1909	823	587	2511	781	523	638	568	235	603	573
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	29.0	18.0	40.5	21.4	13.8	41.5	32.6	37.1	45.3	39.9	40.1
Incr Delay (d2), s/veh	7.3	4.8	2.1	14.6	1.6	0.0	13.7	0.2	3.0	4.1	1.2	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	14.9	11.6	7.9	14.9	0.7	6.7	1.9	6.9	2.7	3.0	3.1
LnGrp Delay(d),s/veh	53.3	33.8	20.1	55.1	23.0	13.8	55.1	32.9	40.1	49.5	41.1	41.5
LnGrp LOS	D	C	C	E	C	B	E	C	D	D	D	D
Approach Vol, veh/h		2337			2488			773			331	
Approach Delay, s/veh		31.6			29.3			47.8			43.7	
Approach LOS		C			C			D			D	

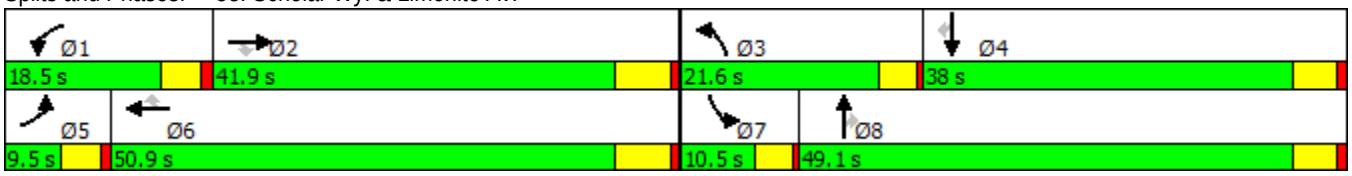
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.4	42.3	18.0	17.9	9.5	53.3	10.7	25.3
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	16.5	36.3	14.7	33.0	5.0	47.8	12.8	34.9
Max Q Clear Time (g_c+I1), s	15.9	31.5	14.0	8.3	5.3	32.7	7.2	16.9
Green Ext Time (p_c), s	0.1	4.7	0.1	2.6	0.0	14.6	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.4
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1566	197	214	2064	47	271	34	186	34	95	66
Future Volume (vph)	65	1566	197	214	2064	47	271	34	186	34	95	66
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Minimum Split (s)	9.5	32.0	32.0	9.5	29.0	29.0	9.5	38.0	38.0	9.5	38.0	38.0
Total Split (s)	9.5	41.9	41.9	18.5	50.9	50.9	21.6	49.1	49.1	10.5	38.0	38.0
Total Split (%)	7.9%	34.9%	34.9%	15.4%	42.4%	42.4%	18.0%	40.9%	40.9%	8.8%	31.7%	31.7%
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 99.2
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 58: Scholar Wy. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1566	197	214	2064	47	271	34	186	34	95	66
Future Volume (veh/h)	65	1566	197	214	2064	47	271	34	186	34	95	66
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	1598	199	218	2106	48	277	35	142	35	97	64
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	85	2050	629	252	2530	769	311	429	364	47	286	126
Arrive On Green	0.05	0.40	0.40	0.14	0.49	0.49	0.17	0.23	0.23	0.03	0.08	0.08
Sat Flow, veh/h	1810	5187	1591	1810	5187	1577	1810	1900	1613	1810	3610	1585
Grp Volume(v), veh/h	66	1598	199	218	2106	48	277	35	142	35	97	64
Grp Sat Flow(s),veh/h/ln	1810	1729	1591	1810	1729	1577	1810	1900	1613	1810	1805	1585
Q Serve(g_s), s	3.3	24.6	7.9	10.8	31.9	1.5	13.6	1.3	6.8	1.8	2.3	3.5
Cycle Q Clear(g_c), s	3.3	24.6	7.9	10.8	31.9	1.5	13.6	1.3	6.8	1.8	2.3	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	2050	629	252	2530	769	311	429	364	47	286	126
V/C Ratio(X)	0.77	0.78	0.32	0.86	0.83	0.06	0.89	0.08	0.39	0.75	0.34	0.51
Avail Cap(c_a), veh/h	99	2050	629	278	2553	776	349	919	780	129	1306	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	24.1	19.1	38.4	20.1	12.3	36.9	27.9	30.0	44.1	39.7	40.3
Incr Delay (d2), s/veh	22.7	2.0	0.3	20.4	2.5	0.0	20.5	0.1	0.5	8.6	0.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	12.1	3.5	6.8	15.8	0.6	8.6	0.7	3.1	1.0	1.2	1.6
LnGrp Delay(d),s/veh	65.7	26.1	19.3	58.8	22.6	12.4	57.4	27.9	30.5	52.7	40.2	42.6
LnGrp LOS	E	C	B	E	C	B	E	C	C	D	D	D
Approach Vol, veh/h		1863			2372			454			196	
Approach Delay, s/veh		26.8			25.8			46.7			43.3	
Approach LOS		C			C			D			D	

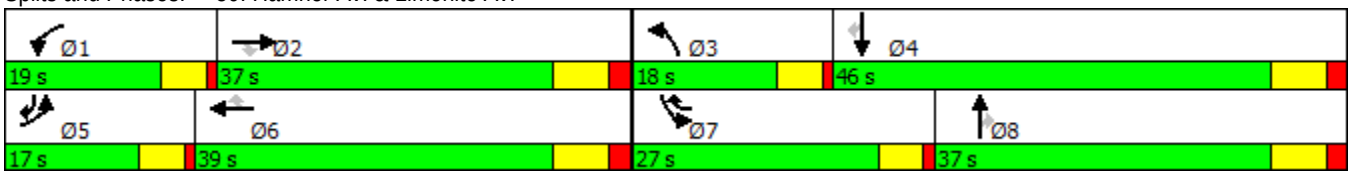
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	42.1	19.7	12.2	8.8	50.5	6.4	25.6
Change Period (Y+Rc), s	4.5	6.0	4.0	5.0	4.5	6.0	4.0	5.0
Max Green Setting (Gmax), s	14.0	35.9	17.6	33.0	5.0	44.9	6.5	44.1
Max Q Clear Time (g_c+I1), s	12.8	26.6	15.6	5.5	5.3	33.9	3.8	8.8
Green Ext Time (p_c), s	0.0	9.1	0.1	1.0	0.0	10.5	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.8
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	1111	185	362	1380	648	237	1010	363	633	983	413
Future Volume (vph)	332	1111	185	362	1380	648	237	1010	363	633	983	413
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	7	3	8	8	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	5.0	5.0	6.0	6.0	5.0	6.0	5.0
Minimum Split (s)	10.0	37.0	37.0	10.0	37.0	10.0	10.0	37.0	37.0	10.0	37.0	10.0
Total Split (s)	17.0	37.0	37.0	19.0	39.0	27.0	18.0	37.0	37.0	27.0	46.0	17.0
Total Split (%)	14.2%	30.8%	30.8%	15.8%	32.5%	22.5%	15.0%	30.8%	30.8%	22.5%	38.3%	14.2%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0	5.0	7.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

Splits and Phases: 59: Hamner Av. & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	332	1111	185	362	1380	648	237	1010	363	633	983	413
Future Volume (veh/h)	332	1111	185	362	1380	648	237	1010	363	633	983	413
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	339	1134	170	369	1408	592	242	1031	293	646	1003	380
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	356	1314	399	415	1401	735	300	1246	378	652	1767	713
Arrive On Green	0.10	0.25	0.25	0.12	0.27	0.27	0.09	0.24	0.24	0.19	0.34	0.34
Sat Flow, veh/h	3510	5187	1574	3510	5187	1610	3510	5187	1571	3510	5187	1612
Grp Volume(v), veh/h	339	1134	170	369	1408	592	242	1031	293	646	1003	380
Grp Sat Flow(s),veh/h/ln	1755	1729	1574	1755	1729	1610	1755	1729	1571	1755	1729	1612
Q Serve(g_s), s	11.4	24.8	10.7	12.3	32.0	32.0	8.0	22.3	20.6	21.8	18.7	20.4
Cycle Q Clear(g_c), s	11.4	24.8	10.7	12.3	32.0	32.0	8.0	22.3	20.6	21.8	18.7	20.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	356	1314	399	415	1401	735	300	1246	378	652	1767	713
V/C Ratio(X)	0.95	0.86	0.43	0.89	1.00	0.81	0.81	0.83	0.78	0.99	0.57	0.53
Avail Cap(c_a), veh/h	356	1314	399	415	1401	735	385	1314	398	652	1767	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	42.3	37.0	51.5	43.2	27.7	53.2	42.7	42.0	48.1	31.9	24.1
Incr Delay (d2), s/veh	35.3	6.7	1.5	19.9	25.2	7.4	7.4	5.0	10.7	32.8	0.7	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	12.6	4.8	7.1	18.5	18.0	4.2	11.3	10.1	13.5	9.0	9.4
LnGrp Delay(d),s/veh	88.2	48.9	38.6	71.3	68.5	35.2	60.6	47.7	52.7	80.9	32.6	25.6
LnGrp LOS	F	D	D	E	F	D	E	D	D	F	C	C
Approach Vol, veh/h		1643			2369			1566			2029	
Approach Delay, s/veh		56.0			60.6			50.6			46.7	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	37.0	15.1	47.4	17.0	39.0	27.0	35.5
Change Period (Y+Rc), s	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	14.0	30.0	13.0	39.0	12.0	32.0	22.0	30.0
Max Q Clear Time (g_c+I1), s	14.3	26.8	10.0	22.4	13.4	34.0	23.8	24.3
Green Ext Time (p_c), s	0.0	3.2	0.1	15.8	0.0	0.0	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	53.8
HCM 2010 LOS	D

Lane Group	EBT	EBR	WBT	WBR	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1643	725	2218	913	517	0	503
Future Volume (vph)	1643	725	2218	913	517	0	503
Turn Type	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	2		6		4	4	
Permitted Phases		2		6			4
Detector Phase	2	2	6	6	4	4	4
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.5	23.5	36.5	36.5	23.5	23.5	23.5
Total Split (s)	54.0	54.0	54.0	54.0	26.0	26.0	26.0
Total Split (%)	67.5%	67.5%	67.5%	67.5%	32.5%	32.5%	32.5%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 12 (15%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 60: I-15 SB Ramps & Limonite Av.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑	↱				↰		↱↱
Traffic Volume (veh/h)	0	1643	725	0	2218	913	0	0	0	517	0	503
Future Volume (veh/h)	0	1643	725	0	2218	913	0	0	0	517	0	503
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900				1900	1900	1900
Adj Flow Rate, veh/h	0	1694	747	0	2287	941				533	0	432
Adj No. of Lanes	0	3	1	0	3	1				2	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	3521	1096	0	3521	1072				665	0	593
Arrive On Green	0.00	0.68	0.68	0.00	1.00	1.00				0.18	0.00	0.18
Sat Flow, veh/h	0	5358	1615	0	5358	1579				3619	0	3230
Grp Volume(v), veh/h	0	1694	747	0	2287	941				533	0	432
Grp Sat Flow(s),veh/h/ln	0	1729	1615	0	1729	1579				1810	0	1615
Q Serve(g_s), s	0.0	12.5	22.1	0.0	0.0	0.0				11.3	0.0	10.1
Cycle Q Clear(g_c), s	0.0	12.5	22.1	0.0	0.0	0.0				11.3	0.0	10.1
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3521	1096	0	3521	1072				665	0	593
V/C Ratio(X)	0.00	0.48	0.68	0.00	0.65	0.88				0.80	0.00	0.73
Avail Cap(c_a), veh/h	0	3521	1096	0	3521	1072				927	0	828
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.36	0.36	0.00	0.35	0.35				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	6.1	7.7	0.0	0.0	0.0				31.3	0.0	30.8
Incr Delay (d2), s/veh	0.0	0.2	1.3	0.0	0.3	3.9				2.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.9	9.9	0.0	0.1	1.2				5.8	0.0	4.6
LnGrp Delay(d),s/veh	0.0	6.3	8.9	0.0	0.3	3.9				33.6	0.0	31.7
LnGrp LOS		A	A		A	A				C		C
Approach Vol, veh/h		2441			3228						965	
Approach Delay, s/veh		7.1			1.4						32.8	
Approach LOS		A			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		59.8		20.2		59.8		
Change Period (Y+Rc), s		5.5		5.5		5.5		
Max Green Setting (Gmax), s		48.5		20.5		48.5		
Max Q Clear Time (g_c+I1), s		24.1		13.3		2.0		
Green Ext Time (p_c), s		23.1		1.4		42.0		

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

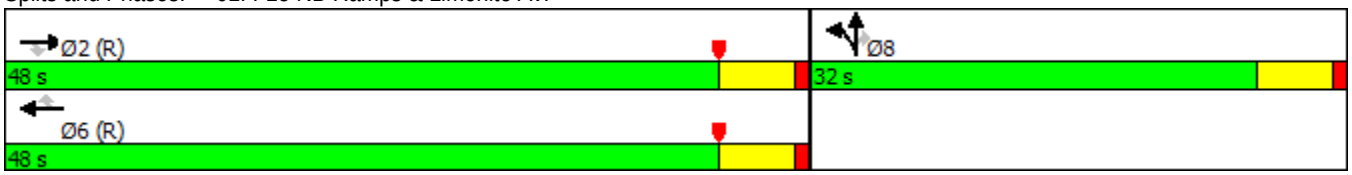
Notes

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (vph)	1920	240	2523	480	608	0	910
Future Volume (vph)	1920	240	2523	480	608	0	910
Turn Type	NA	Perm	NA	Perm	Split	NA	Perm
Protected Phases	2		6		8	8	
Permitted Phases		2		6			8
Detector Phase	2	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	10.5	34.5	34.5	10.5	10.5	10.5
Total Split (s)	48.0	48.0	48.0	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 61: I-15 NB Ramps & Limonite Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1920	240	0	2523	480	608	0	910	0	0	0
Future Volume (veh/h)	0	1920	240	0	2523	480	608	0	910	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0	1900	1900	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	0	1939	242	0	2548	456	614	0	687			
Adj No. of Lanes	0	3	1	0	3	1	2	0	2			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	0	3085	959	0	3085	940	969	0	864			
Arrive On Green	0.00	1.00	1.00	0.00	0.59	0.59	0.27	0.00	0.27			
Sat Flow, veh/h	0	5358	1612	0	5358	1581	3619	0	3226			
Grp Volume(v), veh/h	0	1939	242	0	2548	456	614	0	687			
Grp Sat Flow(s),veh/h/ln	0	1729	1612	0	1729	1581	1810	0	1613			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	31.3	13.1	12.0	0.0	15.8			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	31.3	13.1	12.0	0.0	15.8			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	3085	959	0	3085	940	969	0	864			
V/C Ratio(X)	0.00	0.63	0.25	0.00	0.83	0.49	0.63	0.00	0.80			
Avail Cap(c_a), veh/h	0	3085	959	0	3085	940	1199	0	1069			
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.83	0.83	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	12.9	9.2	25.8	0.0	27.2			
Incr Delay (d2), s/veh	0.0	0.8	0.5	0.0	2.7	1.8	0.8	0.0	3.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.1	0.0	15.4	6.2	6.1	0.0	7.5			
LnGrp Delay(d),s/veh	0.0	0.8	0.5	0.0	15.6	11.0	26.6	0.0	30.7			
LnGrp LOS		A	A		B	B	C		C			
Approach Vol, veh/h		2181			3004			1301				
Approach Delay, s/veh		0.8			14.9			28.7				
Approach LOS		A			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		53.1				53.1		26.9
Change Period (Y+Rc), s		5.5				5.5		5.5
Max Green Setting (Gmax), s		42.5				42.5		26.5
Max Q Clear Time (g_c+I1), s		2.0				33.3		17.8
Green Ext Time (p_c), s		37.0				9.0		3.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Notes

APPENDIX 9.13:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	767	1408	813	455	354	698
v/c Ratio	0.91	0.63	0.73	0.76	0.83	0.75
Control Delay	69.8	12.0	41.9	33.4	58.5	42.7
Queue Delay	0.0	0.0	2.1	0.9	0.0	0.0
Total Delay	69.8	12.0	44.0	34.3	58.5	42.7
Queue Length 50th (ft)	310	212	301	216	283	253
Queue Length 95th (ft)	#385	240	376	#354	#457	328
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	887	2241	1116	600	427	927
Starvation Cap Reductn	0	0	172	31	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.63	0.86	0.80	0.83	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	377	373	345	572	1580	1537	856
v/c Ratio	0.95	0.93	0.81	0.95	0.65	0.95	0.82
Control Delay	80.3	74.5	48.8	55.2	4.4	45.4	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.9	30.7	0.0
Total Delay	80.3	74.5	48.8	55.2	5.3	76.1	15.2
Queue Length 50th (ft)	302	301	211	241	140	597	161
Queue Length 95th (ft)	#498	#502	#363	m#327	157	#767	389
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	406	410	438	610	2415	1621	1043
Starvation Cap Reductn	0	0	0	0	503	0	0
Spillback Cap Reductn	0	0	0	0	0	182	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.91	0.79	0.94	0.83	1.07	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	301	293	279	1679	816	333	1843
v/c Ratio	0.88	0.76	0.73	0.84	0.70	0.88	0.73
Control Delay	71.5	45.8	43.8	15.2	8.4	68.9	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	41.8
Total Delay	71.5	45.8	43.8	15.2	8.4	68.9	55.2
Queue Length 50th (ft)	232	173	154	241	82	142	717
Queue Length 95th (ft)	#375	286	258	m247	m80	m152	m858
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900						
Base Capacity (vph)	378	420	413	1997	1164	386	2530
Starvation Cap Reductn	0	0	0	0	0	0	833
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.68	0.84	0.70	0.86	1.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

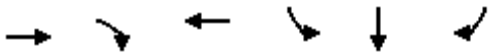
Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1162	499	743	78	265	303	26	70
v/c Ratio	0.85	1.59	0.34	1.00	0.78	0.61	0.09	0.19
Control Delay	42.1	306.0	8.3	159.5	23.5	52.3	41.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	306.0	8.3	159.5	23.5	52.3	41.5	1.2
Queue Length 50th (ft)	414	~553	64	62	0	116	18	0
Queue Length 95th (ft)	#665	m#730	166	#166	#129	143	40	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1367	313	2182	78	338	801	459	500
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.59	0.34	1.00	0.78	0.38	0.06	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



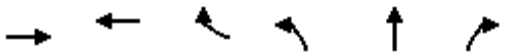
Lane Group	EBT	EBR	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2154	864	2792	233	233	260
v/c Ratio	0.66	0.66	10.02dl	0.66	0.66	0.42
Control Delay	9.8	3.5	106.5	32.5	32.5	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	3.5	106.5	32.5	32.5	19.9
Queue Length 50th (ft)	178	0	~514	88	88	42
Queue Length 95th (ft)	272	45	#635	145	145	68
Internal Link Dist (ft)	2381		680		968	
Turn Bay Length (ft)				400		400
Base Capacity (vph)	3244	1313	2332	474	474	817
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.66	1.20	0.49	0.49	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	2649	2160	459	331	331	727
v/c Ratio	3.68dl	0.78	0.43	0.65	0.65	0.84
Control Delay	212.6	14.7	2.4	26.9	26.9	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	212.6	14.7	2.4	26.9	26.9	30.5
Queue Length 50th (ft)	~552	233	0	117	117	141
Queue Length 95th (ft)	#625	293	37	202	202	#236
Internal Link Dist (ft)	680	1069			1143	
Turn Bay Length (ft)			300	450		400
Base Capacity (vph)	1857	2775	1058	519	519	890
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.43	0.78	0.43	0.64	0.64	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	603	1598	853	784	300	600
v/c Ratio	1.00	0.63	0.50	0.94	1.01	0.93
Control Delay	85.1	13.4	23.3	44.7	102.5	68.4
Queue Delay	0.0	0.8	1.7	44.4	0.0	0.0
Total Delay	85.1	14.2	25.0	89.1	102.5	68.4
Queue Length 50th (ft)	~258	246	234	479	~260	245
Queue Length 95th (ft)	#377	325	292	#763	#461	#362
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	600	2542	1699	832	298	644
Starvation Cap Reductn	0	563	640	153	0	0
Spillback Cap Reductn	0	0	217	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.81	0.81	1.15	1.01	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	487	478	449	363	1715	1418	849
v/c Ratio	0.97	0.95	0.87	0.84	0.79	0.90	0.81
Control Delay	74.8	69.3	50.7	54.2	11.5	41.3	13.4
Queue Delay	0.0	0.3	0.0	0.0	1.1	46.2	0.0
Total Delay	74.8	69.5	50.7	54.2	12.6	87.5	13.4
Queue Length 50th (ft)	391	383	295	135	228	534	122
Queue Length 95th (ft)	#622	#623	#495	m#189	251	#685	338
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	502	502	519	458	2181	1568	1053
Starvation Cap Reductn	0	0	0	0	236	0	0
Spillback Cap Reductn	0	1	0	0	0	289	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.95	0.87	0.79	0.88	1.11	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	393	378	351	1410	521	283	1841
v/c Ratio	0.90	0.87	0.75	0.77	0.51	0.82	0.79
Control Delay	66.8	60.2	42.3	46.7	20.6	66.2	20.2
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	47.6
Total Delay	66.8	60.2	42.3	46.9	20.6	66.2	67.8
Queue Length 50th (ft)	300	284	204	497	168	121	807
Queue Length 95th (ft)	#471	#453	323	568	m281	m131	m865
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900						
Base Capacity (vph)	473	471	499	1826	1017	359	2324
Starvation Cap Reductn	0	0	0	0	0	0	747
Spillback Cap Reductn	0	0	0	70	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.80	0.70	0.80	0.51	0.79	1.17

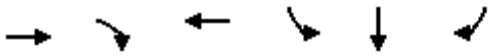
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	477	119	840	36	19	736	169	105
v/c Ratio	0.54	0.31	0.46	0.37	0.10	0.79	0.32	0.19
Control Delay	42.6	34.9	14.2	64.8	1.0	46.4	34.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	34.9	14.2	64.8	1.0	46.4	34.8	2.4
Queue Length 50th (ft)	176	79	205	27	0	270	103	0
Queue Length 95th (ft)	233	m94	m248	63	0	320	154	17
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	939	382	1840	106	193	1091	625	628
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.31	0.46	0.34	0.10	0.67	0.27	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



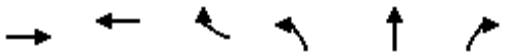
Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1694	708	3216	266	267	519
v/c Ratio	0.51	0.55	7.29dl	0.69	0.69	0.78
Control Delay	8.9	2.4	224.6	38.0	38.1	35.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	2.4	224.6	38.0	38.1	35.8
Queue Length 50th (ft)	157	0	~852	125	126	126
Queue Length 95th (ft)	200	39	#936	205	205	182
Internal Link Dist (ft)	2381		680		968	
Turn Bay Length (ft)				400		400
Base Capacity (vph)	3307	1286	2203	439	439	753
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.55	1.46	0.61	0.61	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	2181	2548	485	301	302	919
v/c Ratio	2.55dl	0.92	0.45	0.53	0.53	0.97
Control Delay	115.9	24.7	2.5	25.8	25.9	48.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.9	24.7	2.5	25.8	25.9	48.9
Queue Length 50th (ft)	~503	402	0	126	127	245
Queue Length 95th (ft)	#601	#501	42	207	208	#387
Internal Link Dist (ft)	680	1069			1143	
Turn Bay Length (ft)			300	450		400
Base Capacity (vph)	1807	2755	1066	568	568	952
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.92	0.45	0.53	0.53	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

APPENDIX 9.14:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	767	1465	815	463	354	698
v/c Ratio	0.91	0.65	0.73	0.77	0.83	0.76
Control Delay	69.2	12.6	42.0	34.4	58.5	43.2
Queue Delay	0.0	0.0	2.1	1.0	0.0	0.0
Total Delay	69.2	12.6	44.1	35.4	58.5	43.2
Queue Length 50th (ft)	311	230	302	223	283	255
Queue Length 95th (ft)	#385	260	377	#377	#457	331
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	887	2241	1116	600	427	923
Starvation Cap Reductn	0	0	172	31	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.65	0.86	0.81	0.83	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	415	407	366	586	1583	1554	856
v/c Ratio	1.02	0.99	0.84	0.96	0.66	0.98	0.83
Control Delay	95.2	86.6	51.7	56.3	4.4	51.0	15.9
Queue Delay	0.0	0.0	0.0	0.0	1.1	41.0	0.0
Total Delay	95.2	86.6	51.7	56.3	5.5	91.9	15.9
Queue Length 50th (ft)	~360	341	231	250	140	610	168
Queue Length 95th (ft)	#570	#572	#403	m#323	157	#782	398
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	406	411	438	610	2391	1591	1031
Starvation Cap Reductn	0	0	0	0	511	0	0
Spillback Cap Reductn	0	0	0	0	0	233	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.99	0.84	0.96	0.84	1.14	0.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	328	315	303	1696	834	333	1952
v/c Ratio	0.92	0.80	0.77	0.86	0.72	0.88	0.78
Control Delay	76.5	49.0	46.6	16.1	9.3	67.0	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	47.5
Total Delay	76.5	49.0	46.6	16.1	9.3	67.0	64.0
Queue Length 50th (ft)	257	195	175	248	93	143	856
Queue Length 95th (ft)	#428	#339	#289	m245	m85	m145	m867
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900						
Base Capacity (vph)	378	415	413	1964	1159	386	2497
Starvation Cap Reductn	0	0	0	0	0	0	829
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.76	0.73	0.86	0.72	0.86	1.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1174	499	745	78	265	303	26	70
v/c Ratio	0.86	1.59	0.34	1.00	0.78	0.61	0.09	0.19
Control Delay	42.7	305.8	8.3	159.5	23.5	52.3	41.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	305.8	8.3	159.5	23.5	52.3	41.5	1.2
Queue Length 50th (ft)	420	~553	63	62	0	116	18	0
Queue Length 95th (ft)	#676	m#720	m167	#166	#129	143	40	0
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	1367	313	2182	78	338	801	459	500
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	1.59	0.34	1.00	0.78	0.38	0.06	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBT	WBR	SBL	SBT	SBR
Lane Group Flow (vph)	2154	873	1674	1162	233	233	260
v/c Ratio	0.66	0.66	0.52	0.83	0.66	0.66	0.42
Control Delay	9.8	3.5	5.3	9.7	32.5	32.5	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	3.5	5.3	9.7	32.5	32.5	19.9
Queue Length 50th (ft)	178	0	82	98	88	88	42
Queue Length 95th (ft)	272	45	131	#269	145	145	68
Internal Link Dist (ft)	2381		680			968	
Turn Bay Length (ft)				500	400		400
Base Capacity (vph)	3244	1316	3244	1395	474	474	817
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.66	0.52	0.83	0.49	0.49	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	2219	430	2160	459	353	354	727
v/c Ratio	0.80	0.41	0.78	0.43	0.70	0.70	0.84
Control Delay	10.4	1.8	14.7	2.4	28.8	28.9	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	1.8	14.7	2.4	28.8	28.9	30.5
Queue Length 50th (ft)	128	2	233	0	128	128	141
Queue Length 95th (ft)	179	28	293	37	#221	#222	#236
Internal Link Dist (ft)	680		1069			1143	
Turn Bay Length (ft)		500		300	450		400
Base Capacity (vph)	2775	1046	2775	1058	519	519	890
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.41	0.78	0.43	0.68	0.68	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	603	1613	863	828	300	600
v/c Ratio	1.00	0.63	0.51	1.00	1.01	0.93
Control Delay	84.8	13.6	23.4	56.3	102.5	68.4
Queue Delay	0.0	0.8	1.8	36.4	0.0	0.0
Total Delay	84.8	14.4	25.2	92.7	102.5	68.4
Queue Length 50th (ft)	~258	253	238	544	~260	245
Queue Length 95th (ft)	#376	333	296	#839	#461	#362
Internal Link Dist (ft)		438	372			763
Turn Bay Length (ft)				100	100	
Base Capacity (vph)	600	2542	1699	832	298	644
Starvation Cap Reductn	0	563	638	144	0	0
Spillback Cap Reductn	0	0	220	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.82	0.81	1.20	1.01	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	494	488	456	432	1731	1422	849
v/c Ratio	0.99	0.97	0.88	0.94	0.79	0.92	0.81
Control Delay	79.2	74.2	52.9	63.0	9.9	43.2	13.7
Queue Delay	0.0	0.4	0.0	0.0	1.6	45.7	0.0
Total Delay	79.2	74.5	52.9	63.0	11.5	88.9	13.7
Queue Length 50th (ft)	400	395	304	169	222	536	125
Queue Length 95th (ft)	#635	#640	#507	m#248	244	#689	341
Internal Link Dist (ft)		1430			385	944	
Turn Bay Length (ft)	400		400	285			
Base Capacity (vph)	500	501	517	458	2181	1546	1046
Starvation Cap Reductn	0	0	0	0	265	0	0
Spillback Cap Reductn	0	1	0	0	0	304	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.98	0.88	0.94	0.90	1.14	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	399	384	358	1492	606	283	1868
v/c Ratio	0.91	0.88	0.76	0.82	0.58	0.82	0.81
Control Delay	67.8	61.7	43.0	47.5	22.6	66.4	21.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	47.5
Total Delay	67.8	61.7	43.0	47.7	22.6	66.4	68.7
Queue Length 50th (ft)	305	292	210	533	233	121	818
Queue Length 95th (ft)	#482	#469	331	608	m338	m129	m870
Internal Link Dist (ft)		1359		1082			385
Turn Bay Length (ft)	900						
Base Capacity (vph)	473	469	499	1819	1037	359	2317
Starvation Cap Reductn	0	0	0	0	0	0	746
Spillback Cap Reductn	0	0	0	42	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.82	0.72	0.84	0.58	0.79	1.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	480	119	851	36	19	736	169	105
v/c Ratio	0.55	0.31	0.46	0.37	0.10	0.79	0.32	0.19
Control Delay	42.7	33.8	13.4	64.8	1.0	46.4	34.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	33.8	13.4	64.8	1.0	46.4	34.8	2.4
Queue Length 50th (ft)	177	76	197	27	0	270	103	0
Queue Length 95th (ft)	235	m90	m239	63	0	320	154	17
Internal Link Dist (ft)	1125		336				1515	
Turn Bay Length (ft)		200				1000		255
Base Capacity (vph)	886	382	1840	106	193	1091	625	628
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.31	0.46	0.34	0.10	0.67	0.27	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBT	WBR	SBL	SBT	SBR
Lane Group Flow (vph)	1694	747	2287	941	266	267	519
v/c Ratio	0.51	0.57	0.69	0.70	0.69	0.69	0.78
Control Delay	8.9	2.6	4.6	2.7	38.0	38.1	35.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	2.6	4.6	2.7	38.0	38.1	35.8
Queue Length 50th (ft)	157	0	92	3	125	126	126
Queue Length 95th (ft)	200	40	m100	m0	205	205	182
Internal Link Dist (ft)	2381		680			968	
Turn Bay Length (ft)				500	400		400
Base Capacity (vph)	3307	1300	3307	1347	439	439	753
Starvation Cap Reductn	0	0	0	4	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.57	0.69	0.70	0.61	0.61	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	1939	242	2548	485	307	307	919
v/c Ratio	0.70	0.25	0.92	0.45	0.54	0.54	0.97
Control Delay	10.8	0.9	24.7	2.5	26.1	26.1	48.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	0.9	24.7	2.5	26.1	26.1	48.9
Queue Length 50th (ft)	178	3	402	0	129	129	245
Queue Length 95th (ft)	198	5	#501	42	211	211	#387
Internal Link Dist (ft)	680		1069			1143	
Turn Bay Length (ft)		500		300	450		400
Base Capacity (vph)	2755	952	2755	1066	568	568	952
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.25	0.92	0.45	0.54	0.54	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 9.15:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5616*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1549*	pc/h/ln
S	*68.6*	mph
D = v_p / S	*22.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5305*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1470*	pc/h/ln
S	*69.2*	mph
D = v_p / S	*21.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7069*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1940*	pc/h/ln
S	*63.6*	mph
D = v_p / S	*30.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7328*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2011*	pc/h/ln
S	*62.4*	mph
D = v_p / S	*32.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4908*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1867*	pc/h/ln
S	*64.8*	mph
D = v_p / S	*28.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6090*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2295*	pc/h/ln
S	*56.1*	mph
D = v_p / S	*40.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4382*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1604*	pc/h/ln
S	*68.1*	mph
D = v_p / S	*23.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4832*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1768*	pc/h/ln
S	*66.3*	mph
D = v_p / S	*26.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6890*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1882*	pc/h/ln
S	*64.6*	mph
D = v_p / S	*29.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CHS*	Highway/Direction of Travel	*SR-60 Westbound*
Agency or Company	*Urban Crossroads, Inc.*	From/To	*E of Euclid*
Date Performed	*10/20/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7073*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1941*	pc/h/ln
S	*63.6*	mph
D = v_p / S	*30.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7065*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1929*	pc/h/ln
S	*63.8*	mph
D = v_p / S	*30.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6755*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1854*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*28.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3745*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1438*	pc/h/ln
S	*69.3*	mph
D = v_p / S	*20.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CHS*	Highway/Direction of Travel	*I-15 Southbound*
Agency or Company	*Urban Crossroads, Inc.*	From/To	*S of Limonite*
Date Performed	*10/20/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4325*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*3*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1653*	pc/h/ln	Design LOS	
S	*67.6*	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	*24.4*	pc/mi/ln	S	mph
LOS	*C*		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3701*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1361*	pc/h/ln
S	*69.7*	mph
D = v_p / S	*19.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 Without Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4488*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1650*	pc/h/ln
S	*67.7*	mph
D = v_p / S	*24.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 9.16:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5624*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1551*	pc/h/ln
S	*68.6*	mph
D = v_p / S	*22.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 10-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*5356*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*4*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.980*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1485*	pc/h/ln
S	*69.1*	mph
D = v_p / S	*21.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7109*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1951*	pc/h/ln
S	*63.5*	mph
D = v_p / S	*30.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7338*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2014*	pc/h/ln
S	*62.3*	mph
D = v_p / S	*32.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4908*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1867*	pc/h/ln
S	*64.8*	mph
D = v_p / S	*28.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6096*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*8*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.962*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2297*	pc/h/ln
S	*56.0*	mph
D = v_p / S	*41.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4382*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1604*	pc/h/ln
S	*68.1*	mph
D = v_p / S	*23.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*AM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4865*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1780*	pc/h/ln
S	*66.1*	mph
D = v_p / S	*26.9*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6928*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1901*	pc/h/ln
S	*64.3*	mph
D = v_p / S	*29.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
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LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Westbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7086*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1945*	pc/h/ln
S	*63.6*	mph
D = v_p / S	*30.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
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LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*W of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7075*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1932*	pc/h/ln
S	*63.8*	mph
D = v_p / S	*30.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*SR-60 Eastbound*
From/To	*E of Euclid*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6803*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1867*	pc/h/ln
S	*64.8*	mph
D = v_p / S	*28.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Southbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3745*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*12*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.943*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1438*	pc/h/ln
S	*69.3*	mph
D = v_p / S	*20.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*CHS*	Highway/Direction of Travel	*I-15 Southbound*
Agency or Company	*Urban Crossroads, Inc.*	From/To	*S of Limonite*
Date Performed	*10/20/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4356*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*11*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.948*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*3*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1665*	pc/h/ln	Design LOS	
S	*67.5*	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	*24.7*	pc/mi/ln	S	mph
LOS	*C*		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*N of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3701*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1361*	pc/h/ln
S	*69.7*	mph
D = v_p / S	*19.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*CHS*
Agency or Company	*Urban Crossroads, Inc.*
Date Performed	*10/20/2016*
Analysis Time Period	*PM Peak Hour*

Site Information

Highway/Direction of Travel	*I-15 Northbound*
From/To	*S of Limonite*
Jurisdiction	*Caltrans*
Analysis Year	*2040 With Project W IMPROV*

Project Description *Kimball Business Center TIA (JN 09774)*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4497*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT		veh/day	%Trucks and Buses, P_T	*3*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.985*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1654*	pc/h/ln
S	*67.6*	mph
D = v_p / S	*24.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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APPENDIX 9.17:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp Inputs		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	4	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2200 ft	Acceleration Lane Length, L_A	750	L_{down} =	ft
V_u =	1019 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	4286		
		Ramp Volume, V_R	1330		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4286	0.92	Level	0	0	1.000	1.00	4659
Ramp	1330	0.92	Level	11	0	0.948	1.00	1525
UpStream	1019	0.92	Level	20	0	0.909	1.00	1218
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.027 using Equation (Exhibit 13-6)

V_{12} = 127 pc/h

V_3 or V_{av34} = 2266 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1863 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6184	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3388	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 26.5 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.369 (Exibit 13-11)

S_R = 59.7 mph (Exhibit 13-11)

S_0 = 66.8 mph (Exhibit 13-11)

S = 62.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	5305	V_D =	1330 veh/h
		Ramp Volume, V_R	1019		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5305	0.92	Level	4	0	0.980	1.00	5882
Ramp	1019	0.92	Level	20	0	0.909	1.00	1218
UpStream								
DownStream	1330	0.92	Level	11	0	0.948	1.00	1525

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3252 pc/h

V_3 or V_{av34} 1315 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5882	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4664	Exhibit 13-8	9600	No
V_R	1218	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3252	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.408 (Exhibit 13-12)

S_R = 58.6 mph (Exhibit 13-12)

S_0 = 75.6 mph (Exhibit 13-12)

S = 65.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	7069	V_D =	1080 veh/h
		Ramp Volume, V_R	821		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7069	0.92	Level	2	0	0.990	1.00	7761
Ramp	821	0.92	Level	16	0	0.926	1.00	964
UpStream								
DownStream	1080	0.92	Level	16	0	0.926	1.00	1268

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3927 pc/h

V_3 or V_{av34} 1917 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7761	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6797	Exhibit 13-8	9600	No
V_R	964	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3927	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.385 (Exhibit 13-12)

S_R = 59.2 mph (Exhibit 13-12)

S_0 = 73.2 mph (Exhibit 13-12)

S = 65.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2115 ft
- V_u = 821 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	6248
Ramp Volume, V_R	1080
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6248	0.92	Level	0	0	1.000	1.00	6791
Ramp	1080	0.92	Level	16	0	0.926	1.00	1268
UpStream	821	0.92	Level	16	0	0.926	1.00	964
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = (Equation 13-6 or 13-7)
- P_{FM} = 0.059 using Equation (Exhibit 13-6)
- V_{12} = 403 pc/h
- V_3 or V_{av34} = 3194 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 2716 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8059	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3984	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

- D_R = 32.8 (pc/mi/ln)
- LOS = D (Exhibit 13-2)

Speed Determination

- M_S = 0.486 (Exibit 13-11)
- S_R = 56.4 mph (Exhibit 13-11)
- S_0 = 64.5 mph (Exhibit 13-11)
- S = 60.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	1930 ft
V_u =	veh/h	Freeway Volume, V_F	4908	V_D =	1843 veh/h
		Ramp Volume, V_R	661		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4908	0.92	Level	10	0	0.952	1.00	5602
Ramp	661	0.92	Level	18	0	0.917	1.00	783
UpStream								
DownStream	1843	0.92	Level	7	0	0.966	1.00	2073

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.584 using Equation (Exhibit 13-7)

V_{12} = 3597 pc/h

V_3 or V_{av34} 2005 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5602	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4819	Exhibit 13-8	7200	No
V_R	783	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3597	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.368 (Exhibit 13-12)

S_R = 59.7 mph (Exhibit 13-12)

S_0 = 72.9 mph (Exhibit 13-12)

S = 63.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	1930 ft	Acceleration Lane Length, L_A	675	L_{down} =	ft
V_u =	661 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	4247		
		Ramp Volume, V_R	1843		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4247	0.92	Level	9	0	0.957	1.00	4824
Ramp	1843	0.92	Level	7	0	0.966	1.00	2073
UpStream	661	0.92	Level	18	0	0.917	1.00	783
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1727.06 (Equation 13-6 or 13-7)

P_{FM} = 0.596 using Equation (Exhibit 13-6)

V_{12} = 2877 pc/h

V_3 or V_{av34} = 1947 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2877 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6897	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4950	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 38.9 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.811 (Exibit 13-11)

S_R = 47.3 mph (Exhibit 13-11)

S_0 = 64.8 mph (Exhibit 13-11)

S = 51.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp Inputs		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2010 ft	Acceleration Lane Length, L_A	700	L_{down} =	ft
V_u =	1250 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	3582		
		Ramp Volume, V_R	800		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3582	0.92	Level	0	0	1.000	1.00	3893
Ramp	800	0.92	Level	12	0	0.943	1.00	922
UpStream	1250	0.92	Level	5	0	0.976	1.00	1393
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1292.61 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 2325 pc/h

V_3 or V_{av34} = 1568 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2325 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4815	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3247	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.358 (Exibit 13-11)

S_R = 60.0 mph (Exhibit 13-11)

S_0 = 66.2 mph (Exhibit 13-11)

S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	2010 ft
V_u =	veh/h	Freeway Volume, V_F	4832	V_D =	800 veh/h
		Ramp Volume, V_R	1250		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4832	0.92	Level	2	0	0.990	1.00	5305
Ramp	1250	0.92	Level	5	0	0.976	1.00	1393
UpStream								
DownStream	800	0.92	Level	12	0	0.943	1.00	922

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.563 using Equation (Exhibit 13-7)

V_{12} = 3597 pc/h

V_3 or V_{av34} 1708 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5305	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3912	Exhibit 13-8	7200	No
V_R	1393	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3597	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.423 (Exhibit 13-12)

S_R= 58.1 mph (Exhibit 13-12)

S_0= 74.0 mph (Exhibit 13-12)

S = 62.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	750	☑ No	☐ Off
L_{up} =	2200 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	1356 veh/h	Freeway Volume, V_F	5730	V_D =	veh/h
		Ramp Volume, V_R	1198		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5730	0.92	Level	0	0	1.000	1.00	6228
Ramp	1198	0.92	Level	10	0	0.952	1.00	1367
UpStream	1356	0.92	Level	9	0	0.957	1.00	1540
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.047 using Equation (Exhibit 13-6)

V_{12} = 292 pc/h

V_3 or V_{av34} = 2968 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2491 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7595	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3858	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.438 (Exibit 13-11)

S_R = 57.7 mph (Exhibit 13-11)

S_0 = 65.1 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	7073	V_D =	1160 veh/h
		Ramp Volume, V_R	1343		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7073	0.92	Level	2	0	0.990	1.00	7765
Ramp	1343	0.92	Level	8	0	0.962	1.00	1518
UpStream								
DownStream	1160	0.92	Level	8	0	0.962	1.00	1311

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4242 pc/h

V_3 or V_{av34} 1761 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7765	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6247	Exhibit 13-8	9600	No
V_R	1518	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4242	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 39.2 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.435 (Exhibit 13-12)

S_R = 57.8 mph (Exhibit 13-12)

S_0 = 73.8 mph (Exhibit 13-12)

S = 64.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	7065	V_D =	790 veh/h
		Ramp Volume, V_R	1100		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7065	0.92	Level	1	0	0.995	1.00	7718
Ramp	1100	0.92	Level	9	0	0.957	1.00	1249
UpStream								
DownStream	790	0.92	Level	18	0	0.917	1.00	936

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4069 pc/h

V_3 or V_{av34} 1824 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7718	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6469	Exhibit 13-8	9600	No
V_R	1249	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4069	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.410 (Exhibit 13-12)

S_R = 58.5 mph (Exhibit 13-12)

S_0 = 73.6 mph (Exhibit 13-12)

S = 64.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2115 ft
- V_u = 1100 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	5965
Ramp Volume, V_R	790
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5965	0.92	Level	0	0	1.000	1.00	6484
Ramp	790	0.92	Level	18	0	0.917	1.00	936
UpStream	1100	0.92	Level	9	0	0.957	1.00	1249
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = (Equation 13-6 or 13-7)
- P_{FM} = 0.101 using Equation (Exhibit 13-6)
- V_{12} = 654 pc/h
- V_3 or V_{av34} = 2915 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 2593 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7420	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3529	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

- D_R = 29.4 (pc/mi/ln)
- LOS = D (Exhibit 13-2)

Speed Determination

- M_S = 0.409 (Exibit 13-11)
- S_R = 58.5 mph (Exhibit 13-11)
- S_0 = 64.8 mph (Exhibit 13-11)
- S = 61.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	1930 ft
V_u =	veh/h	Freeway Volume, V_F	3745	V_D =	1600 veh/h
		Ramp Volume, V_R	1020		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3745	0.92	Level	12	0	0.943	1.00	4315
Ramp	1020	0.92	Level	6	0	0.971	1.00	1142
UpStream								
DownStream	1600	0.92	Level	5	0	0.976	1.00	1783

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.600 using Equation (Exhibit 13-7)

V_{12} = 3045 pc/h

V_3 or V_{av34} 1270 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4315	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3173	Exhibit 13-8	7200	No
V_R	1142	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3045	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.401 (Exhibit 13-12)

S_R = 58.8 mph (Exhibit 13-12)

S_0 = 75.7 mph (Exhibit 13-12)

S = 62.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 1930 ft
- V_u = 1020 veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	675
Deceleration Lane Length L_D	
Freeway Volume, V_F	2725
Ramp Volume, V_R	1600
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2725	0.92	Level	15	0	0.930	1.00	3184
Ramp	1600	0.92	Level	5	0	0.976	1.00	1783
UpStream	1020	0.92	Level	6	0	0.971	1.00	1142
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = 1314.04 (Equation 13-6 or 13-7)
- P_{FM} = 0.596 using Equation (Exhibit 13-6)
- V_{12} = 1899 pc/h
- V_3 or V_{av34} = 1285 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 1899 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4967	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3682	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

- D_R = 29.1 (pc/mi/ln)
- LOS = D (Exhibit 13-2)

Speed Determination

- M_S = 0.415 (Exibit 13-11)
- S_R = 58.4 mph (Exhibit 13-11)
- S_0 = 67.2 mph (Exhibit 13-11)
- S = 60.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	700	☑ No	☐ Off
L_{up} =	2010 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	1507 veh/h	Freeway Volume, V_F	2981	V_D =	veh/h
		Ramp Volume, V_R	720		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2981	0.92	Level	2	0	0.990	1.00	3273
Ramp	720	0.92	Level	8	0	0.962	1.00	814
UpStream	1507	0.92	Level	5	0	0.976	1.00	1679
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1136.82 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 1954 pc/h

V_3 or V_{av34} = 1319 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1954 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4087	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2768	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 22.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.320 (Exibit 13-11)

S_R = 61.0 mph (Exhibit 13-11)

S_0 = 67.1 mph (Exhibit 13-11)

S = 62.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	2010 ft
V_u =	veh/h	Freeway Volume, V_F	4488	V_D =	720 veh/h
		Ramp Volume, V_R	1507		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4488	0.92	Level	3	0	0.985	1.00	4951
Ramp	1507	0.92	Level	5	0	0.976	1.00	1679
UpStream								
DownStream	720	0.92	Level	8	0	0.962	1.00	814

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.559 using Equation (Exhibit 13-7)

V_{12} = 3508 pc/h

V_3 or V_{av34} 1443 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4951	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3272	Exhibit 13-8	7200	No
V_R	1679	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3508	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.449 (Exhibit 13-12)

S_R = 57.4 mph (Exhibit 13-12)

S_0 = 75.1 mph (Exhibit 13-12)

S = 61.6 mph (Exhibit 13-13)

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APPENDIX 9.18:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp Inputs		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	4	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2200 ft	Acceleration Lane Length, L_A	750	L_{down} =	ft
V_u =	1070 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	4286		
		Ramp Volume, V_R	1338		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4286	0.92	Level	0	0	1.000	1.00	4659
Ramp	1338	0.92	Level	11	0	0.948	1.00	1534
UpStream	1070	0.92	Level	22	0	0.901	1.00	1291
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.026 using Equation (Exhibit 13-6)

V_{12} = 121 pc/h

V_3 or V_{av34} = 2269 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1863 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6193	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3397	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.370 (Exibit 13-11)

S_R = 59.6 mph (Exhibit 13-11)

S_0 = 66.8 mph (Exhibit 13-11)

S = 62.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	5356	V_D =	1338 veh/h
		Ramp Volume, V_R	1070		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5356	0.92	Level	4	0	0.980	1.00	5938
Ramp	1070	0.92	Level	22	0	0.901	1.00	1291
UpStream								
DownStream	1338	0.92	Level	11	0	0.948	1.00	1534

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3317 pc/h

V_3 or V_{av34} 1310 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5938	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	4647	Exhibit 13-8	9600	No
V_R	1291	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3317	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 31.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.414 (Exhibit 13-12)

S_R = 58.4 mph (Exhibit 13-12)

S_0 = 75.6 mph (Exhibit 13-12)

S = 64.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	7109	V_D =	1090 veh/h
		Ramp Volume, V_R	861		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7109	0.92	Level	2	0	0.990	1.00	7804
Ramp	861	0.92	Level	18	0	0.917	1.00	1020
UpStream								
DownStream	1090	0.92	Level	16	0	0.926	1.00	1280

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 3978 pc/h

V_3 or V_{av34} 1913 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7804	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6784	Exhibit 13-8	9600	No
V_R	1020	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3978	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 36.5 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.390 (Exhibit 13-12)

S_R = 59.1 mph (Exhibit 13-12)

S_0 = 73.2 mph (Exhibit 13-12)

S = 65.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp
- ☑ Yes ☐ On
- ☐ No ☑ Off
- L_{up} = 2115 ft
- V_u = 861 veh/h

Freeway Number of Lanes, N	4
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	500
Deceleration Lane Length L_D	
Freeway Volume, V_F	6248
Ramp Volume, V_R	1090
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	45.0

Downstream Adj Ramp
- ☐ Yes ☐ On
- ☑ No ☐ Off
- L_{down} = ft
- V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	6248	0.92	Level	0	0	1.000	1.00	6791
Ramp	1090	0.92	Level	16	0	0.926	1.00	1280
UpStream	861	0.92	Level	18	0	0.917	1.00	1020
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

- L_{EQ} = (Equation 13-6 or 13-7)
- P_{FM} = 0.058 using Equation (Exhibit 13-6)
- V_{12} = 393 pc/h
- V_3 or V_{av34} = 3199 pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No
- If Yes, V_{12a} = 2716 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	8071	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3996	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

- D_R = 32.9 (pc/mi/ln)
- LOS = D (Exhibit 13-2)

Speed Determination

- M_S = 0.488 (Exibit 13-11)
- S_R = 56.3 mph (Exhibit 13-11)
- S_0 = 64.5 mph (Exhibit 13-11)
- S = 60.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

- L_{EQ} = (Equation 13-12 or 13-13)
- P_{FD} = using Equation (Exhibit 13-7)
- V_{12} = pc/h
- V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)
- Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
- Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
- If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

- D_R = (pc/mi/ln)
- LOS = (Exhibit 13-2)

Speed Determination

- D_s = (Exhibit 13-12)
- S_R = mph (Exhibit 13-12)
- S_0 = mph (Exhibit 13-12)
- S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	1930 ft
V_u =	veh/h	Freeway Volume, V_F	4908	V_D =	1849 veh/h
		Ramp Volume, V_R	661		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4908	0.92	Level	10	0	0.952	1.00	5602
Ramp	661	0.92	Level	18	0	0.917	1.00	783
UpStream								
DownStream	1849	0.92	Level	7	0	0.966	1.00	2080

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.584 using Equation (Exhibit 13-7)

V_{12} = 3597 pc/h

V_3 or V_{av34} 2005 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5602	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	4819	Exhibit 13-8	7200	No
V_R	783	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3597	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.368 (Exhibit 13-12)

S_R = 59.7 mph (Exhibit 13-12)

S_0 = 72.9 mph (Exhibit 13-12)

S = 63.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	675	☑ No	☐ Off
L_{up} =	1930 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	661 veh/h	Freeway Volume, V_F	4247	V_D =	veh/h
		Ramp Volume, V_R	1849		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4247	0.92	Level	9	0	0.957	1.00	4824
Ramp	1849	0.92	Level	7	0	0.966	1.00	2080
UpStream	661	0.92	Level	18	0	0.917	1.00	783
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1728.56 (Equation 13-6 or 13-7)

P_{FM} = 0.596 using Equation (Exhibit 13-6)

V_{12} = 2877 pc/h

V_3 or V_{av34} = 1947 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2877 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6904	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4957	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 39.0 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.815 (Exibit 13-11)

S_R = 47.2 mph (Exhibit 13-11)

S_0 = 64.8 mph (Exhibit 13-11)

S = 51.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	700	☑ No	☐ Off
L_{up} =	2010 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	1283 veh/h	Freeway Volume, V_F	3582	V_D =	veh/h
		Ramp Volume, V_R	800		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3582	0.92	Level	0	0	1.000	1.00	3893
Ramp	800	0.92	Level	12	0	0.943	1.00	922
UpStream	1283	0.92	Level	5	0	0.976	1.00	1429
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1292.61 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 2325 pc/h

V_3 or V_{av34} = 1568 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2325 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4815	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3247	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.358 (Exibit 13-11)

S_R = 60.0 mph (Exhibit 13-11)

S_0 = 66.2 mph (Exhibit 13-11)

S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	2010 ft
V_u =	veh/h	Freeway Volume, V_F	4865	V_D =	800 veh/h
		Ramp Volume, V_R	1283		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4865	0.92	Level	2	0	0.990	1.00	5341
Ramp	1283	0.92	Level	5	0	0.976	1.00	1429
UpStream								
DownStream	800	0.92	Level	12	0	0.943	1.00	922

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.561 using Equation (Exhibit 13-7)

V_{12} = 3623 pc/h

V_3 or V_{av34} 1718 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5341	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3912	Exhibit 13-8	7200	No
V_R	1429	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3623	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.427 (Exhibit 13-12)

S_R = 58.1 mph (Exhibit 13-12)

S_0 = 74.0 mph (Exhibit 13-12)

S = 62.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp Inputs		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	4	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2200 ft	Acceleration Lane Length, L_A	750	L_{down} =	ft
V_u =	1356 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	5730		
		Ramp Volume, V_R	1198		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5730	0.92	Level	0	0	1.000	1.00	6228
Ramp	1198	0.92	Level	10	0	0.952	1.00	1367
UpStream	1356	0.92	Level	9	0	0.957	1.00	1540
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.047 using Equation (Exhibit 13-6)

V_{12} = 292 pc/h

V_3 or V_{av34} = 2968 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2491 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7595	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3858	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 30.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.438 (Exibit 13-11)

S_R = 57.7 mph (Exhibit 13-11)

S_0 = 65.1 mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Westbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	175	L_{down} =	2200 ft
V_u =	veh/h	Freeway Volume, V_F	7086	V_D =	1198 veh/h
		Ramp Volume, V_R	1356		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7086	0.92	Level	2	0	0.990	1.00	7779
Ramp	1356	0.92	Level	9	0	0.957	1.00	1540
UpStream								
DownStream	1198	0.92	Level	10	0	0.952	1.00	1367

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4260 pc/h

V_3 or V_{av34} 1759 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7779	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6239	Exhibit 13-8	9600	No
V_R	1540	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4260	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 39.3 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.437 (Exhibit 13-12)

S_R = 57.8 mph (Exhibit 13-12)

S_0 = 73.8 mph (Exhibit 13-12)

S = 64.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Euclid
Date Performed	10/20/216	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	220	L_{down} =	2115 ft
V_u =	veh/h	Freeway Volume, V_F	7075	V_D =	838 veh/h
		Ramp Volume, V_R	1110		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	7075	0.92	Level	1	0	0.995	1.00	7729
Ramp	1110	0.92	Level	9	0	0.957	1.00	1261
UpStream								
DownStream	838	0.92	Level	20	0	0.909	1.00	1002

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 using Equation (Exhibit 13-7)

V_{12} = 4081 pc/h

V_3 or V_{av34} 1824 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	7729	Exhibit 13-8	9600	No
$V_{FO} = V_F - V_R$	6468	Exhibit 13-8	9600	No
V_R	1261	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4081	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 37.4 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

D_s = 0.411 (Exhibit 13-12)

S_R= 58.5 mph (Exhibit 13-12)

S_0= 73.6 mph (Exhibit 13-12)

S = 64.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	SR-60 Eastbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Euclid
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	4	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	500	☑ No	☐ Off
L_{up} =	2115 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	1110 veh/h	Freeway Volume, V_F	5965	V_D =	veh/h
		Ramp Volume, V_R	838		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5965	0.92	Level	0	0	1.000	1.00	6484
Ramp	838	0.92	Level	20	0	0.909	1.00	1002
UpStream	1110	0.92	Level	9	0	0.957	1.00	1261
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.093 using Equation (Exhibit 13-6)

V_{12} = 600 pc/h

V_3 or V_{av34} = 2942 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☑ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 2593 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7486	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3595	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.418 (Exibit 13-11)

S_R = 58.3 mph (Exhibit 13-11)

S_0 = 64.8 mph (Exhibit 13-11)

S = 61.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	1930 ft
V_u =	veh/h	Freeway Volume, V_F	3745	V_D =	1631 veh/h
		Ramp Volume, V_R	1020		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3745	0.92	Level	12	0	0.943	1.00	4315
Ramp	1020	0.92	Level	6	0	0.971	1.00	1142
UpStream								
DownStream	1631	0.92	Level	5	0	0.976	1.00	1817

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.600 using Equation (Exhibit 13-7)

V_{12} = 3045 pc/h

V_3 or V_{av34} 1270 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4315	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3173	Exhibit 13-8	7200	No
V_R	1142	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3045	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 28.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.401 (Exhibit 13-12)

S_R = 58.8 mph (Exhibit 13-12)

S_0 = 75.7 mph (Exhibit 13-12)

S = 62.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Southbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☑ Yes	☐ On	Ramp Number of Lanes, N	1	☐ Yes	☐ On
☐ No	☑ Off	Acceleration Lane Length, L_A	675	☑ No	☐ Off
L_{up} =	1930 ft	Deceleration Lane Length L_D		L_{down} =	ft
V_u =	1020 veh/h	Freeway Volume, V_F	2725	V_D =	veh/h
		Ramp Volume, V_R	1631		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2725	0.92	Level	15	0	0.930	1.00	3184
Ramp	1631	0.92	Level	5	0	0.976	1.00	1817
UpStream	1020	0.92	Level	6	0	0.971	1.00	1142
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1321.31 (Equation 13-6 or 13-7)

P_{FM} = 0.596 using Equation (Exhibit 13-6)

V_{12} = 1899 pc/h

V_3 or V_{av34} = 1285 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1899 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5001	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3716	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 29.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.421 (Exibit 13-11)

S_R = 58.2 mph (Exhibit 13-11)

S_0 = 67.2 mph (Exhibit 13-11)

S = 60.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	On-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway/Ramp Inputs		Downstream Adj Ramp	
☑ Yes	☐ On	Freeway Number of Lanes, N	3	☐ Yes	☐ On
☐ No	☑ Off	Ramp Number of Lanes, N	1	☑ No	☐ Off
L_{up} =	2010 ft	Acceleration Lane Length, L_A	700	L_{down} =	ft
V_u =	1516 veh/h	Deceleration Lane Length L_D		V_D =	veh/h
		Freeway Volume, V_F	2981		
		Ramp Volume, V_R	720		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2981	0.92	Level	2	0	0.990	1.00	3273
Ramp	720	0.92	Level	8	0	0.962	1.00	814
UpStream	1516	0.92	Level	5	0	0.976	1.00	1689
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 1136.82 (Equation 13-6 or 13-7)

P_{FM} = 0.597 using Equation (Exhibit 13-6)

V_{12} = 1954 pc/h

V_3 or V_{av34} = 1319 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☑ Yes ☐ No

If Yes, V_{12a} = 1954 pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4087	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2768	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 22.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.320 (Exibit 13-11)

S_R = 61.0 mph (Exhibit 13-11)

S_0 = 67.1 mph (Exhibit 13-11)

S = 62.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	CHS	Freeway/Dir of Travel	I-15 Northbound
Agency or Company	Urban Crossroads, Inc.	Junction	Off-ramp at Limonite
Date Performed	10/20/2016	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project W/ IMPROV

Project Description: Kimball Business Center TIA (JN 09774)

Inputs

Upstream Adj Ramp		Freeway Number of Lanes, N	3	Downstream Adj Ramp	
☐ Yes	☐ On	Ramp Number of Lanes, N	1	☑ Yes	☑ On
☑ No	☐ Off	Acceleration Lane Length, L_A		☐ No	☐ Off
L_{up} =	ft	Deceleration Lane Length L_D	200	L_{down} =	2010 ft
V_u =	veh/h	Freeway Volume, V_F	4497	V_D =	720 veh/h
		Ramp Volume, V_R	1516		
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4497	0.92	Level	3	0	0.985	1.00	4961
Ramp	1516	0.92	Level	5	0	0.976	1.00	1689
UpStream								
DownStream	720	0.92	Level	8	0	0.962	1.00	814

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R = mph (Exhibit 13-11)

S_0 = mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.558 using Equation (Exhibit 13-7)

V_{12} = 3516 pc/h

V_3 or V_{av34} 1445 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4961	Exhibit 13-8	7200	No
$V_{FO} = V_F - V_R$	3272	Exhibit 13-8	7200	No
V_R	1689	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3516	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.450 (Exhibit 13-12)

S_R = 57.4 mph (Exhibit 13-12)

S_0 = 75.1 mph (Exhibit 13-12)

S = 61.6 mph (Exhibit 13-13)

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